E-SOUVENIR
Anatomical Society
of
King George Medical University,
UP
Lucknow, 226003
Organizing Committee

Prof. Punita Manik  
Organizing Chairperson

Prof. Anita Rani  
Organizing Secretary  
Oral Presentation

Prof. Jyoti Chopra  
Organizing Secretary  
CME Program

Prof. Archana Rani  
Organizing Secretary  
Workshop & E- Souvenir

Dr. R. K. Diwan  
Organizing Secretary  
Poster Presentation

Dr. R.K. Verma  
Organizing Secretary  
Poster Presentation & Workshop

Dr. Garima Sehgal  
Organizing Secretary  
PG Quiz

Dr. A.K. Pankaj  
Organizing Secretary  
Das-Halim Oration

Dr. Sushma Tomar  
Organizing Secretary  
UG Quiz
The Department of Anatomy was one of the four blocks which was completed for the King George's Medical University, Lucknow at the time of ceremonial opening of the college building by Sir John Hewett in January 1912. The department has a two storied building made on an area of 32,436 sq. ft. which is designed in the INDO-SARACENIC style. The academic excellence of the department is world famous. Initially it started with 11 MBBS students and Dr. SS Khan was the first head of the department (1911-1926). Till date the department has been guided by 15 heads and each one has contributed a new dimension to the department. We also have some of the internationally acclaimed anatomists like Dr. AC Das (former head) who was a MLC, Dr. DR Singh (former head) and Dr. Mahdi Hasan was BC Roy Awardee. They have published many books pertaining to the field of Anatomy. Presently the torch of success is being carried under the able guidance and headship of Prof. Punita Manik.

The department was one of the first in the country to accord an MS degree to post-graduate student in 1940. Dr. Aon Mohammed was the first post-graduate of Anatomy department. The Museum is one of the best in South East Asia. The initial lot of specimens, models, charts in the museum was brought from England. This historic museum meticulously and systematically displays number of specimens of embryology, gross anatomy, anthropology, radiology, surface anatomy, osteology, cross
Sectional anatomy, genetics etc. Complete skeletal system of human beings, foetuses and various animals are of special interest. Since then major expansions have taken place and renovation of museum was done in 2010.

**Museum**

Department also has a library facility that is easily accessible to all the residents and faculty. It is fully equipped with all the recent as well as old edition of books, journals and bulletins pertaining to Anatomy.

**Library** **Lecture Theatre**

The architecture of the department speaks about its rich and ancient line age but with modern amenities. It has one fully air-conditioned lecture theatre with ICT facilities, seven demonstration rooms and research laboratories. Laboratories include histology lab, body preservation lab, dissection hall and annexae, cytogenetic & tissue culture lab, anthropology lab and cadaveric skilled lab. Dissection hall and Cadaveric Skill laboratory beautifully displays the CT and MRI films. The department has fully functional subspecialties of Gross Anatomy, Imaging Anatomy, Neuroanatomy, Histology (Microanatomy), Reproductive Biology, Teratology, Cytogenetics, Tissue Culture and Embryology.
At present the department offers MBBS courses to 250 students and to 70 BDS students whereas post graduate seats have been increased to eleven. The department had privilege of organizing two national conferences that is silver jubilee NATCON in 1975 and 63rd NATCON in 2015 and one state conference i.e. 26th UPASICON in 2018.
Over these years about 419 research papers have been published. Karyotyping for common genetic disorders has been started recently in the Cytogenetics lab of the department. The department has Anatomical society which was established in 1956. The society organizes various activities annually.

**Activities of Anatomical Society:**

1. Paper Writing Competition for under graduate students
2. Dr. Dharam Narayan Memorial Book Prize Competition
3. Journal of the Anatomical Society of KGMU (once in a year)
4. S. S. Khan Dissection Competition
5. Anatomy Quiz contest
6. Das and Halim Oration
7. Annual Debate
8. Annual Picnic
10. Human Bones to students for educational use
11. Embalming
12. Annual Function

![S.S. Khan Dissection Competition](image1)

![Dr. Dharam Narayan Book Prize Competition](image2)

![Debate Competition](image3)

![Journal of the Anatomical Society](image4)
WELCOME DELEGATES

Department of Anatomy
Faculty & Residents

Sitting from left: Dr. Garima Sehgal, Dr. R.K. Diwan, Dr. Anita Rani, Dr. Punita Manik, Nikita Singh, Dr. Jyoti Chopra, Dr. Archana Rani, Dr. R.K. Verma, Dr. A.K. Pankaj.

Standing from left: Dr. Arun Kumar, Dr. Surendra Yadav, Dr. Chetna Sharma, Dr. Anam Ahmad, Dr. Akirti Anand, Dr. Faizan Ansari, Dr. Kanchan Bisht, Dr. Swati Saxena, Dr. Untika Singh, Dr. Ankit Sharma, Dr. Adya Priyadarshini, Dr. Vipin Kumar, Dr. Amber Irfan, Dr. Amber Rana, Dr. Rintu Biswas, Dr. Saba Anjum, Dr. Nikhil Aggarwal, Dr. Anupriya Singh, Dr. Honey Zahra, Dr. Marium Moonis, Dr. Sumbul.
Faculty & Students’ executive Committee

Sitting from left: Dr. Garima Sehgal, Dr. R.K. Diwan, Dr. Anita Rani, Dr. Punita Manik, Nikita Singh, Dr. Jyoti Chopra, Dr. Archana Rani, Dr. R.K. Verma, Dr. A.K. Pankaj.

A warm welcome to all delegates

It gives us great pleasure to welcome you all to the Department of Anatomy, King George's Medical University, U.P., Lucknow for what we know will be an informative, productive and enjoyable three days. We welcome all the delegates from across the world, students, scientists, and professors, related to the arena of Anatomy to be a part of the International Virtual Anatomy Conference 20-22 Feb 2021. We sincerely hope that you will take back happy memories of a great academic experience.

Organizing Committee
IVACON 2021
Department of Anatomy
King George’s Medical University UP, Lucknow
MESSAGE

I am pleased to know that the Department of Anatomy, King George's Medical University UP is hosting the International Virtual Anatomy Conference from 20-22 Feb 2021. The theme of the conference is "Contemporary and evolving perspectives in learning Anatomy". I am sure that this conference will be an ideal platform to discuss various contemporary issues associated with learning and teaching anatomy.

I sincerely believe that his academic feast will be a wonderful opportunity for the faculty, research scholars & students to showcase their academic work and achievements. I am sure that this exchange of videos, thoughts and perspectives will enrich and enhance knowledge in the Anatomy ecosystem.

The undergraduates and postgraduate students will be delighted to be a part of this unique National level Quiz Competition. It will also include a virtual workshop on Karyotyping techniques. I hope this three day conference would expand our mental horizon and help the medical system in India to emulate the best practices around the world.

I am confident that the department of Anatomy will excel with its commitment to achieve newer heights in future.

I wish the organizers a grand success in their endeavor.

Best wishes

(Lt. Gen. (Dr.) Bipin Puri)
Vice Chancellor
King George’s Medical University
Uttar Pradesh, Lucknow – 226003, India

Prof. Uma Singh
Dean, Faculty of Medicine

Message

It gives me immense pleasure to know that the Department of Anatomy, King George’s Medical University UP is organising its First International Virtual Conference from 20 -22 Feb 2021. The theme of the conference is “Contemporary and evolving perspectives in learning Anatomy”. This virtual meet will provide learning insights from various eminent speakers all over the globe and will give a greater stature to this renowned institute.

I am confident that this conference will give ample opportunities to budding anatomists to think, explore and adopt various means of learning and teaching anatomy.

It is my privilege to quote “Continue to turn your challenges into meaningful productive activity. Strive for excellence, work hard to earn trust, be kind to one another and stay humble.”

I wish the organizers a brilliant success for this conference.

(Prof. Uma Singh)
Dean, Faculty of Medicine
King George’s Medical University, UP,
Lucknow.

E-mail: deac.medical@kgmcindia.edu, Web: kgmu.org
Ph.0522-2258293, Mobile No. +919451408978
Dear Friends and Colleagues,

It is my proud privilege to welcome you all to the International Virtual Anatomy Conference on “Contemporary and evolving perspectives in learning Anatomy” for three days from 20 – 22 Feb 2021. This e - conference will bring together medical fraternities of world fame to deliver and discuss their innovative ideas in the field of human anatomy. It is overwhelming to receive huge number of abstracts for scientific presentations. Conference will also provide a unique opportunity to our undergraduate and postgraduate students to participate in a national level quiz competition. Lastly, a virtual workshop on karyotyping techniques is also being organized to enrich the experience of many budding anatomists.

I extend my sincere thanks to the august gathering for giving us unconditional support in enthusiastically participating in this mega event.

I admire and appreciate the sincere efforts put forth by the organizing team during difficult times of Covid 19 pandemic in offering an excellent online academic feast.

Wishing you all a memorable academic event.

Dr Punita Manik
Organizing Chairperson
IVACON 2021
King George's Medical University, UP
Lucknow
## PROGRAMME AT A GLANCE

### 20th February 2021 (Day 1)

<table>
<thead>
<tr>
<th>Time</th>
<th>Activity</th>
<th>Speaker/Moderator</th>
</tr>
</thead>
<tbody>
<tr>
<td>9:00am-10:00 am</td>
<td>Inauguration</td>
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<tr>
<td>10:00am-11:00 am</td>
<td>Das &amp; Halim Oration &quot;Anatomy of Speech: An Update&quot;</td>
<td>Dr A K Srivastava, Professor, PIMS, Lucknow</td>
</tr>
<tr>
<td>11:00am-2:00 pm</td>
<td><strong>Scientific Sessions I</strong>&lt;br&gt;Oral Presentation</td>
<td>11-12- 4 parallel sessions&lt;br&gt;12-1- 4 parallel sessions&lt;br&gt;1-2- 3 parallel sessions</td>
</tr>
<tr>
<td></td>
<td><strong>Lunch Break</strong></td>
<td></td>
</tr>
<tr>
<td>2pm-2:45 pm</td>
<td><strong>Guest Lecture</strong>: &quot;Blended learning and cadaveric dissection: New Perspectives in Anatomy Education&quot;</td>
<td>Dr Cecilia Brassett&lt;br&gt;University Clinical Anatomist&lt;br&gt;Human Anatomy Centre&lt;br&gt;Department of Physiology, Development and Neuroscience&lt;br&gt;University of Cambridge</td>
</tr>
<tr>
<td>2:45pm-3:30 pm</td>
<td><strong>Guest Lecture</strong>: &quot;Assessing public knowledge of anatomy through engagement: What do they know and what does it mean for anatomy education?&quot;</td>
<td>Dr Adam Taylor&lt;br&gt;Director of the Clinical Anatomy Learning Centre &amp; Professor of Anatomy&lt;br&gt;Lancaster Medical School&lt;br&gt;Faculty of Health and Medicine&lt;br&gt;Lancaster University, UK</td>
</tr>
<tr>
<td>3:30pm-5:00 pm</td>
<td><strong>Scientific Sessions II</strong>&lt;br&gt;Poster Presentation</td>
<td>3:30-4:15- 3 parallel sessions&lt;br&gt;4:15-5:00-3 parallel sessions</td>
</tr>
<tr>
<td>5:00pm-6:30 pm</td>
<td>&quot;Ana Cognizance&quot; UG Quiz Competition Finale</td>
<td></td>
</tr>
<tr>
<td>6:30pm-7:30 pm</td>
<td>Cultural Fiesta</td>
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### 21st February 2021 (Day 2)

<table>
<thead>
<tr>
<th>Time</th>
<th>Activity</th>
<th>Speaker/Moderator</th>
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</thead>
<tbody>
<tr>
<td>9:00am-9:45am</td>
<td><strong>Guest Lecture</strong>: &quot;Ergonomics and Anatomy&quot;</td>
<td>Dr D R Singh&lt;br&gt;Emeritus Professor&lt;br&gt;Department of Anatomy&lt;br&gt;King George’s Medical University, Lucknow</td>
</tr>
<tr>
<td>9:45am-10:30am</td>
<td><strong>Guest Lecture</strong>: &quot;Contemporary Neuro-embryology and its relevance in understanding fetal medicine&quot;</td>
<td>Dr Sabita Mishra&lt;br&gt;Director Professor&lt;br&gt;Department of Anatomy&lt;br&gt;Maulana Azad Medical College, New Delhi</td>
</tr>
<tr>
<td>10:30am-12:45pm</td>
<td><strong>Scientific Sessions III</strong>&lt;br&gt;Oral Presentation</td>
<td>10:30-11:15-4 parallel sessions&lt;br&gt;11:15-12:45-4 parallel sessions</td>
</tr>
</tbody>
</table>
1:00pm-1:30pm | **Guest Lecture:** "Solving Clinical Problems with Anatomical Solutions" | Dr Tracey Wilkinson, Cox Chair of Anatomy, Director, Centre for Anatomy and Human Identification, School of Science and Engineering, University of Dundee

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**Lunch Break**

2:00pm-2:45pm | **Guest Lecture:** "Developing a Regional Anatomy Program for Core Surgical Training in Scotland" | Dr Ross A Jones, Lecturer in Clinical & Surgical Anatomy, College of Medicine & Veterinary Medicine, University of Edinburgh

2:45pm-3:30pm | **Guest Lecture:** "Sono-Anatomy of Upper Limb Nerves" | Dr Atul Gaur, Consultant Anaesthetist, University Hospitals of Leicester, UK

3:30pm-5:00pm | **Scientific Sessions IV**

| Poster Presentation | 3:30-4:15 - 3 parallel sessions
| 4:15-5:00 - 2 parallel sessions |

5:00pm-7:00 pm | "Anatomy Mastermind" PG Quiz Competition Finale

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22th February 2021 (Day 3)

**Post-conference Workshop - "Virtual Workshop on Karyotyping"**

<table>
<thead>
<tr>
<th>Time</th>
<th>Activity</th>
<th>Speaker/Moderator</th>
</tr>
</thead>
<tbody>
<tr>
<td>09.00AM - 09.30AM</td>
<td>Introduction to the workshop &amp; Cytogenetics</td>
<td>Dr Navneet Kumar, Professor of Anatomy, Principal Secretary Autonomous State Medical College Basti</td>
</tr>
</tbody>
</table>

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<thead>
<tr>
<th>Time</th>
<th>Activity</th>
<th>Speaker/Moderator</th>
</tr>
</thead>
<tbody>
<tr>
<td>09.30AM - 10.00AM</td>
<td>The basics of karyotyping and its application in diagnosis of various diseases, and what beyond it</td>
<td>Dr Vaidehi Joanputra</td>
</tr>
</tbody>
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<tr>
<th>Time</th>
<th>Activity</th>
<th>Speaker/Moderator</th>
</tr>
</thead>
<tbody>
<tr>
<td>10.00AM - 11.00AM</td>
<td>Methodology of Karyotyping</td>
<td>Mr. Brijesh Kumar, Senior Scientist AGILE</td>
</tr>
</tbody>
</table>

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<thead>
<tr>
<th>Time</th>
<th>Activity</th>
<th>Speaker/Moderator</th>
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</thead>
<tbody>
<tr>
<td>10.00AM - 11.00AM</td>
<td>Introduction of Microscope and software for karyotyping/FISH</td>
<td>Mr. Rajeev Jaiswal, Application Specialist – Microscopy/Imaging</td>
</tr>
</tbody>
</table>

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<thead>
<tr>
<th>Time</th>
<th>Activity</th>
<th>Speaker/Moderator</th>
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</thead>
<tbody>
<tr>
<td>11.00AM - 1:00PM</td>
<td>Virtual Demonstration of Collection, Planting and Harvesting of sample</td>
<td>Organizing Committee</td>
</tr>
</tbody>
</table>

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**Lunch Break**

2:00PM - 4:00PM | Virtual Demonstration Slide Preparation, staining and Interpretation of Blood | Organizing Committee

4:00pm-5:00pm | Discussion of Karyotype few cases Q & A session | Experts & Organizing Committee

5:00pm-6:00pm | Valedictory Function |
# Oral Presentation

**DAY-1**

**Scientific Sessions I**

**Anthropometry - Room 1**

**Date:** 20.02.2021  
**Time:** 11:00 AM - 12:00 AM

**Chairpersons:** Dr. Anuradha Baruah, Dr. Praveen Ojha, Dr. Manisha R Gaikwad

<table>
<thead>
<tr>
<th>S. No</th>
<th>Presenter’s ID</th>
<th>Name</th>
<th>Title of Presentation</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>IVACON-0000245</td>
<td>Chhavi Makker</td>
<td>To study certain parameter of lower end of femur namely bicondylar width and intercondylar notch width.</td>
</tr>
<tr>
<td>2</td>
<td>IVACON-0000514</td>
<td>Karishma Sharma</td>
<td>Anthropometry of familial short stature females of the city lie in foothill of Himalaya</td>
</tr>
<tr>
<td>3</td>
<td>IVACON-0000476</td>
<td>Rakesh Swami</td>
<td>Morphometric study of ear lobule and age related changes</td>
</tr>
<tr>
<td>4</td>
<td>IVACON-0000482</td>
<td>Sharad Kumar</td>
<td>An anatomical study of lumbosacral transitional vertebrae</td>
</tr>
<tr>
<td>5</td>
<td>IVACON-0000356</td>
<td>SurekhaWaghanna</td>
<td>Study on morphology and morphometric of mental foramen in dry human mandible of Rajasthan population of India</td>
</tr>
<tr>
<td>6</td>
<td>IVACON-0000181</td>
<td>Jai Krishnan D</td>
<td>Morphometric study and clinical application of proximal end of humerus</td>
</tr>
</tbody>
</table>
# Anthropometry - Room 2

**Date:** 20.02.2021  
**Time:** 11:00 AM - 12:00 AM  
**Chairpersons:** Dr. Aribam Jaishree Devi, Dr. Poonam Patnaik, Dr. Satheesha B Nayak

<table>
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<tbody>
<tr>
<td>7</td>
<td>IVACON-000046</td>
<td>Lekhni Vyas</td>
<td>Morphological study of sacral hiatus in dry human sacrum in udaipur district</td>
</tr>
<tr>
<td>8</td>
<td>IVACON-000055</td>
<td>Reginamary. B</td>
<td>Morphologic and morphometric study of talus</td>
</tr>
<tr>
<td>9</td>
<td>IVACON-000097</td>
<td>Krati Bhardwaj</td>
<td>Study of morphometric study of foramen magnum in dry human skull.</td>
</tr>
<tr>
<td>10</td>
<td>IVACON-0000182</td>
<td>Anasuya Ghosh</td>
<td>Cranial anthropometry and cephalic index in new born of west bengal</td>
</tr>
<tr>
<td>11</td>
<td>IVACON-0000154</td>
<td>Jayalakshmi P.V.</td>
<td>Determination of sex from mastoid process of dry human skulls of dakshinakannada by</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>deriving discriminant function equation</td>
</tr>
<tr>
<td>12</td>
<td>IVACON-0000187</td>
<td>M. RajAnand</td>
<td>Morphometric and morphological study of first rib and its clinical significance</td>
</tr>
</tbody>
</table>
**Date:** 20.02.2021  
**Time:** 11:00 AM - 12:00AM  
**Chairpersons:** Dr. M S Siddiqui, Dr. Rakesh Kumar Agrawal, Dr R K Verma.

<table>
<thead>
<tr>
<th>S No</th>
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<th>Name</th>
<th>Title of Presentation</th>
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<tbody>
<tr>
<td>13</td>
<td>IVACON-0000496</td>
<td>Kumar Satish Rav</td>
<td>Taxation of Micronuclei frequency as a prognostic marker in Oral and oropharyngeal carcinoma - A cytogenetic study</td>
</tr>
<tr>
<td>14</td>
<td>IVACON-0000125</td>
<td>Vinutha S P</td>
<td>Profile of musculoskeletal anomalies at a tertiary care hospital an autopsy based study</td>
</tr>
<tr>
<td>15</td>
<td>IVACON-0000407</td>
<td>Manisha B Sinha</td>
<td>Sperm DNA Fragmentation: An Important landmark of male infertility</td>
</tr>
<tr>
<td>16</td>
<td>IVACON-0000336</td>
<td>Priyanka Rana</td>
<td>Morphometric study of human placenta and insight into its vascular pattern by corrosion cast technique</td>
</tr>
<tr>
<td>17</td>
<td>IVACON-0000501</td>
<td>Kavita Modi</td>
<td>Morphometric analysis of human fetal liver at different gestational ages.</td>
</tr>
<tr>
<td>18</td>
<td>IVACON-0000159</td>
<td>Kalpana Gehlot</td>
<td>Gross morphological study of placenta in normal and IUFD cases</td>
</tr>
<tr>
<td>S No</td>
<td>Presenter’s ID</td>
<td>Name</td>
<td>Title of Presentation</td>
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<tr>
<td>19</td>
<td>IVACON-000079</td>
<td>B Anjaneyababu Naik</td>
<td>Effect of rf-emr produced by mobile phone on male s.d rats fertility and ameliorating effect of punica granatum</td>
</tr>
<tr>
<td>20</td>
<td>IVACON-0000489</td>
<td>Bharti Jakhar</td>
<td>A Morphometric Study of Human Foetal Pancreas and Correlations with its Embryogenesis</td>
</tr>
<tr>
<td>21</td>
<td>IVACON-0000506</td>
<td>Ramesh P</td>
<td>Study of correlation between neonatal and placental weight in normal and PIH pregnancy</td>
</tr>
<tr>
<td>22</td>
<td>IVACON-0000400</td>
<td>Samta Tiwari</td>
<td>Macroscopic study showing teratogenic effect of propylthiouracil on fetal organs of swiss albino mice</td>
</tr>
<tr>
<td>23</td>
<td>IVACON-000095</td>
<td>Surendra Yadav</td>
<td>Cytogenetic study in children with acute leukemia and its correlation with clinical presentation in north Indian region</td>
</tr>
</tbody>
</table>
## Anthropometry - Room 5

**Date:** 20.02.2021  
**Time:** 12:00 PM - 1:00 PM  
**Chairpersons:** Dr. Mukesh Singla, Dr. Sanjeev Jain, Dr. Lakshmi Rajgopal

<table>
<thead>
<tr>
<th>S No</th>
<th>Presenter’s ID</th>
<th>Name</th>
<th>Title of Presentation</th>
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<tbody>
<tr>
<td>25</td>
<td>IVACON-0000136</td>
<td>Soni Kumari</td>
<td>Morphometric study of head and neck of dried adult femora in Bihar and its clinical importance</td>
</tr>
<tr>
<td>26</td>
<td>IVACON-0000270</td>
<td>Ashish Kumar</td>
<td>Measurement of bowing of radius in dry bone in population of western Rajasthan</td>
</tr>
<tr>
<td>27</td>
<td>IVACON-0000263</td>
<td>Jitendra Singh</td>
<td>A descriptive study of morphometric method data of femoral condyle by direct method to determine differences rt and lt side</td>
</tr>
<tr>
<td>28</td>
<td>IVACON-0000225</td>
<td>Manu Shekhawat</td>
<td>Morphological and morphometric study of glenoid cavity in western Rajasthan population</td>
</tr>
<tr>
<td>29</td>
<td>IVACON-0000121</td>
<td>Ruta Bapat</td>
<td>Maximum cranial length: important parameter in sexing of crania</td>
</tr>
<tr>
<td>30</td>
<td>IVACON-0000169</td>
<td>Sumita Agarwal</td>
<td>The study of heterotrophic ossification of hip bones and pelvis muscle and ligaments</td>
</tr>
<tr>
<td>31</td>
<td>IVACON-0000102</td>
<td>Harpreet Singh</td>
<td>A study on the effect of body mass index on work body posture of clininess</td>
</tr>
</tbody>
</table>
# Anthropometry - Room 6

**Date:** 20.02.2021  
**Time:** 12:00 PM - 1:00 PM  
**Chairpersons:** Dr. Shilpi Jain, Dr. Dalvinder Singh, Dr. Praveen Balasubramanian Iyer

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<thead>
<tr>
<th>S No</th>
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<th>Name</th>
<th>Title of Presentation</th>
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</thead>
<tbody>
<tr>
<td>32</td>
<td>IVACON-0000247</td>
<td>Ram Prakash Saini</td>
<td>Variations of carrying angle with age, sex, height and special reference to side</td>
</tr>
<tr>
<td>33</td>
<td>IVACON-0000436</td>
<td>Arvind Deswal</td>
<td>Femoral neck antversion angle (fna) in femur bone</td>
</tr>
<tr>
<td>34</td>
<td>IVACON-000049</td>
<td>K. Uma</td>
<td>The metopic suture - facts and faiths</td>
</tr>
<tr>
<td>35</td>
<td>IVACON-0000128</td>
<td>Pinki Rai</td>
<td>Is arm-span an accurate measure of stature?</td>
</tr>
<tr>
<td>36</td>
<td>IVACON-0000240</td>
<td>Sagun Shukla</td>
<td>Morphometric study of greater sciatic notch on dry human hip bone</td>
</tr>
<tr>
<td>37</td>
<td>IVACON-0000147</td>
<td>Suresh Sharma</td>
<td>Establishment of sexual dimorphism of permanent maxillary canine teeth in Rajasthan population</td>
</tr>
<tr>
<td>38</td>
<td>IVACON-0000409</td>
<td>Sanjay Kumar Yadav</td>
<td>The morphometric variations adult's human face in Nepal</td>
</tr>
</tbody>
</table>
### Anthropometry -Room 7

**Date:** 20.02.2021  
**Time:** 12:00 PM- 1:00PM

**Chairpersons:** Dr. Sridevi N S, Dr. Seema, Dr. Rashmi Malhotra

<table>
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<tbody>
<tr>
<td>39</td>
<td>IVACON-0000266</td>
<td>Bhavesh Kumar</td>
<td>Morphometric analysis of foramen spinosum in western Rajasthan skull</td>
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<tr>
<td>40</td>
<td>IVACON-0000500</td>
<td>Pooja</td>
<td>A morphometric study of the lumbar vertebrae giving emphasis on the pedicular</td>
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<td>41</td>
<td>IVACON-0000206</td>
<td>Rachana Gehlot</td>
<td>Anatomical variation in the position of the greater palatine foramen</td>
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<tr>
<td>42</td>
<td>IVACON-000053</td>
<td>Amruta Rajput</td>
<td>Determining new anthropometric markers for screening type 2 dm in Caribbean region</td>
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<tr>
<td>43</td>
<td>IVACON-0000123</td>
<td>Sushma Daripelli</td>
<td>Morphometric analysis of suprascapular foramen in Telangana population</td>
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<tr>
<td>44</td>
<td>IVACON-0000363</td>
<td>Arun Kumar</td>
<td>Anthropometric measurement of upper end of tibia in north Indian population and its clinical significance:dry bone study</td>
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<td>45</td>
<td>IVACON-0000283</td>
<td>Kanchan Bisht</td>
<td>A morphometric study of patella in Lucknow region</td>
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</tbody>
</table>
Applied Anatomy -Room 8

**Date:** 20.02.2021

**Time:** 12:00 PM - 1:00PM

**Chairpersons:** Dr. Ruchira Sethi, Dr. T Rajan, Dr. S K Pandey

<table>
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<tr>
<td>46</td>
<td>IVACON-0000257</td>
<td>Abhinav</td>
<td>Study of lip print by photographic method in population of Uttar Pradesh</td>
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<tr>
<td>47</td>
<td>IVACON-0000197</td>
<td>Ankit Paul</td>
<td>Variant anatomy of the iliac venous system: a study linked with laparoscopic hernia reduction and pelvic surgeries</td>
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<td>48</td>
<td>IVACON-000044</td>
<td>M. Gopalan</td>
<td>Anatomical considerations of full face transplant</td>
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<td>49</td>
<td>IVACON-000090</td>
<td>Pushpa NB</td>
<td>Lip print analysis using image processing - a promising tool in personal analysis</td>
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<td>50</td>
<td>IVACON-000117</td>
<td>Simriti</td>
<td>Identifying the best site for bone graft harvesting from anterior iliac creast</td>
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<td>51</td>
<td>IVACON-000435</td>
<td>Anju Bala</td>
<td>Correlation of dermatoglyphics pattern in diabetic with hypertensive patients</td>
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<tr>
<td>52</td>
<td>IVACON-000218</td>
<td>Jolly Agarwal</td>
<td>Ossified ligaments of pelvis and its clinical implication</td>
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</table>
# Histology -Room 9

**Date:** 20.02.2021  
**Time:** 1:00 PM - 2:00PM  

**Chairpersons:** Dr. Kumar Satish Ravi, Dr. Gyan Prakash Mishra, Dr. Pranchi SaffarAneja

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<tr>
<td>53</td>
<td>IVACON-0000428</td>
<td>Abhilasha Maharshi</td>
<td>Hormone marker of pitutary adenomas ; an immunohistochemical study</td>
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<td>54</td>
<td>IVACON-0000254</td>
<td>Darshita Singh</td>
<td>Comparison of frequency of micronucleus in individual with history of tobacco and without history of tobacco</td>
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<td>55</td>
<td>IVACON-0000241</td>
<td>Deepshikha Kori</td>
<td>Histological analysis of coronary atherosclerosis at myocardial bridges</td>
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<td>56</td>
<td>IVACON-000033</td>
<td>Diwakar Dhurandhar</td>
<td>Stereological estimation of effects of Sucralose on liver of albino rats</td>
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<td>57</td>
<td>IVACON-0000189</td>
<td>Manali Arora</td>
<td>Oral exfoliative cytology using Perl’s Prussian blue for screening of iron overload in patients with β-thalassemia major: An analytical study</td>
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<td>58</td>
<td>IVACON-0000369</td>
<td>Shweta Kumari</td>
<td>Histomorphomeric and Histochemical Characteristics of Human Placenta In Maternal Hypothyroidism</td>
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<td>59</td>
<td>IVACON-0000344</td>
<td>Sumati Purohit</td>
<td>A histology study of adult human cadaveric tissue as an alternative to animal tissue</td>
</tr>
</tbody>
</table>
## Histology -Room 10

**Date:** 20.02.2021  
**Time:** 1:00 PM- 2:00PM  

**Chairpersons:** Dr. N Pratheepa Sivasankari, Dr.KalpanaThounaojam, Dr.Punita Manik

<table>
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<th>S No</th>
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<tr>
<td>60</td>
<td>IVACON-0000</td>
<td>Rabia Amin</td>
<td>Effect of Variable Doses of Cisplatin on Microanatomy of Liver in albino rats</td>
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<tr>
<td>61</td>
<td>IVACON-0000148</td>
<td>Vidya C S</td>
<td>Cadaveric study of circumvallate papillae and taste bud density across geriatric age group</td>
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<tr>
<td>62</td>
<td>IVACON-0000139</td>
<td>Deepti Chandrakar</td>
<td>A comparative study of morphometry and histology of human umbilical cord in normal healthy pregnant females and pregnant females with pregnancy induced hypertension</td>
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<tr>
<td>63</td>
<td>IVACON-0000140</td>
<td>Suresh Tadipi</td>
<td>Ameliorative effects of Ginkgobiloba on histomorphological changes and learning &amp; memory impairments induced by Fluoride &amp; Arsenic in Wistar rats.</td>
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<td>64</td>
<td>IVACON-000016</td>
<td>Ujwala</td>
<td>Study of histology of placenta in sickle cell anemia</td>
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<td>65</td>
<td>IVACON-0000286</td>
<td>Swati Saxena</td>
<td>Genderwise histological differences in the human upper lip.</td>
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<td>66</td>
<td>IVACON-0000335</td>
<td>Shivani Chawla</td>
<td>A Study of Comparison of two Histologic stains for the assessment of Human Spermatozoa morphology under light microscopy</td>
</tr>
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</table>
## Gross Anatomy-Room 11

**Date:** 20.02.2021  
**Time:** 1:00 PM - 2:00PM  
**Chairpersons:** Dr. M Gopalan, Dr. C Swathi Poornima, Dr. Rajat Subhra Das

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<tr>
<td>67</td>
<td>IVACON-0000374</td>
<td>Yuvraj Sharma</td>
<td>A human cadaveric study : communications between the median nerve and musculocutaneous nerve.</td>
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<tr>
<td>68</td>
<td>IVACON-000040</td>
<td>Vaibhav Bhatnagar</td>
<td>Study of coronary artery dominance patterns in Western India – A cadaveric study</td>
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<td>69</td>
<td>IVACON-0000410</td>
<td>Unnamatla. Sudha Rani</td>
<td>A cadaveric study on the morphology of human spleen</td>
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<td>70</td>
<td>IVACON-0000533</td>
<td>R. K. Dewan</td>
<td>Morphological variations of human liver: A cadaveric study</td>
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<td>71</td>
<td>IVACON-0000123</td>
<td>Sushma Daripelli</td>
<td>Variant Anatomy of Gonadal Veins : A Rare Scenario In The Cadaveric Study.</td>
</tr>
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<td>72</td>
<td>IVACON-000045</td>
<td>Sushant Vanawat</td>
<td>Morphological study of brachial artery in cadavers</td>
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<tr>
<td>73</td>
<td>IVACON-0000114</td>
<td>Sunil S Shekhawat</td>
<td>Morphology and variations in branching of the internal iliac artery: Implications for Obstetric surgeries</td>
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<tr>
<td>74</td>
<td>IVACON-0000505</td>
<td>Ritu Singh</td>
<td>A Cadaveric study of perforators of arm to provide anatomical basis to skin flap design</td>
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</tbody>
</table>
# DAY-2

**Scientific Sessions III**

**Medical Education -Room 1**

**Date:** 21.02.2021  
**Time:** 10:30 AM - 11:30 AM

**Chairpersons:** Dr. Brijendra Singh, Dr. Jyoti Chopra

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<th>S No</th>
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<tr>
<td>75</td>
<td>IVACON-0000162</td>
<td>Anne D Souza</td>
<td>Active Learning Strategies to Enhance Student Engagement During Online Anatomy Learning</td>
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<tr>
<td>76</td>
<td>IVACON-0000160</td>
<td>Arvind Kumar Pandey</td>
<td>Assessment Using a Mobile App in the Anatomy Classroom: Students’ Perspective</td>
</tr>
<tr>
<td>77</td>
<td>IVACON-0000392</td>
<td>Ashima Das</td>
<td>Evaluation of newly introduced structured foundation course in MBBS curriculum at entry level in India: students’ perspective</td>
</tr>
<tr>
<td>78</td>
<td>IVACON-0000458</td>
<td>C. Swathi Poornima</td>
<td>“Desire for Medical Gifting”- Qualitative Analysis of Attitudinal and Motivational Perspectives of Registered Whole-Body Donors.</td>
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<td>79</td>
<td>IVACON-0000305</td>
<td>Gayatri Girish Muthiyam</td>
<td>Identifying the role of picture based questions for assessment in Anatomy</td>
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<tr>
<td>80</td>
<td>IVACON-0000126</td>
<td>Midhat Muttaqui</td>
<td>A Comparative study of offline versus online teaching of Anatomy conducted on First year MBBS students of JNMC, AMU, Aligarh.</td>
</tr>
<tr>
<td>81</td>
<td>IVACON-000063</td>
<td>Vanita Gupta</td>
<td>Assessment of psychological morbidity among first year medical students</td>
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</table>
# Imaging - Room 2

**Date:** 21.02.2021  
**Time:** 10:30 AM - 11:30 AM

**Chairpersons:** Dr. C S Ramesh Babu, Dr. Pratishtha Potdar, Dr. Suniti Pandey

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<tr>
<td>82</td>
<td>IVACON-0000478</td>
<td>Dewanshi Mishra</td>
<td>Prevalence and distribution of dominance and ramus intermedius in north Indian population on CT cardiac angiography</td>
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<tr>
<td>83</td>
<td>IVACON-000085</td>
<td>Kumari Pooja</td>
<td>A MRI Study of volume of Hippocampus</td>
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<tr>
<td>84</td>
<td>IVACON-0000316</td>
<td>Pareesa Rabbani</td>
<td>Morphometric Analysis Of Macula In Different Age Groups And Gender In Indian Adult Population</td>
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<td>85</td>
<td>IVACON-0000472</td>
<td>Sanjula Singh</td>
<td>Evaluation of the role of various imaging modalities in the</td>
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<tr>
<td>86</td>
<td>IVACON-0000124</td>
<td>Suranjana</td>
<td>Placental Thickness Measurement by Ultrasonography and its Correlation with Gestational Age of Fetus in Manipuri Population</td>
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<tr>
<td>87</td>
<td>IVACON-0000491</td>
<td>Akhalaq Ahmad</td>
<td>Morphometric study Analysis of Lumbar Spinal Canal &amp; its Clinical significance: A radiological study</td>
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<tr>
<td>88</td>
<td>IVACON-0000481</td>
<td>Syeda Sadia Sameera</td>
<td>Study of correlation of morphometric and radiological parameters</td>
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## Medical Education - Room 3

**Date:** 21.02.2021  
**Time:** 10:30 AM - 11:30 AM

**Chairpersons:** Dr. S P Sawant, Dr. Monali Sonawane

<table>
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| 89   | IVACON-0000271   | Najma Mobin       | “Exploring the perception of medical students on the utility and implications of plastinates for anatomical studies”.
| 90   | IVACON-0000179   | Payal Kasat       | Framing of multiple-choice questions by medical students: a strategy for active learning during covid-19 pandemic lockdown |
| 91   | IVACON-0000313   | Poornima Kalla    | Plastination, a modern teaching tool: To study cross-sectional anatomy with corresponding MRI images. |
| 92   | IVACON-000091    | Pushpalatha K.    | A Delphi consensus study to identify most valuable assessment tools to assess anatomy Competencies in CBME curriculum |
| 93   | IVACON-0000168   | Raveena Singh     | E-Learning in Medical Anatomy during COVID-19 Pandemic                               |
| 94   | IVACON-0000115   | Roli Joshi        | Evaluation of feedback by first year MBBS students — a study on implemented one month foundation course |
| 95   | IVACON-0000498   | Saju Binu Cherian | Concept Mapping: An Activity to Foster concepts, Ideas, and Relationships of Anatomical Structures in Medical Undergraduates |
## Gross Anatomy-Room 4

**Date:** 21.02.2021  
**Time:** 10:30 AM - 11:30AM  

**Chairpersons:** Dr. Manisha B Sinha, Dr. Ambica Wadhwa

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<tr>
<td>96</td>
<td>IVACON-000024</td>
<td>Saranya Ragavan</td>
<td>A true insight into the morphological variations of human liver</td>
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<td>97</td>
<td>IVACON-000036</td>
<td>Sapna A K</td>
<td>A cadaveric study on Branching pattern of Terminal branches of Facial nerve</td>
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<td>98</td>
<td>IVACON 000058</td>
<td>Bharathi</td>
<td>A South Indian Cadaveric Study on anatomic characteristics of Corona Mortis and its Clinical Significance</td>
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<td>IVACON-0000488</td>
<td>Divasha</td>
<td>Clinico-embryological insinuation of obturator vessels.</td>
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<td>100</td>
<td>IVACON-0000188</td>
<td>Fatima Bhopalwala Ali</td>
<td>An anatomical study of the nutrient foramen of adult human tibia</td>
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<td>101</td>
<td>IVACON-0000464</td>
<td>Ashwini N S</td>
<td>Morphological variations of liver in humans and its surgical relevance</td>
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<tr>
<td>102</td>
<td>IVACON-0000146</td>
<td>Adya Priyadarshini</td>
<td>Morphological study of chordae tendinea of human AV valves</td>
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# Applied Anatomy - Room 5

**Date:** 21.02.2021  
**Time:** 11:30 AM - 12:45 PM  
**Chairpersons:** Dr. Preeti Dnyandeo Sonje, Dr. Sunita U Sawant, Dr. Vivek

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<tr>
<td>103</td>
<td>IVACON-0000280</td>
<td>Anam Ahmad</td>
<td>Morphometry of nutrient foramen of human long bones of leg and its clinical relevance</td>
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<td>104</td>
<td>IVACON-000075</td>
<td>Shilpi Shrivastava</td>
<td>Morphometric and topographic analysis of nutrient foramen of dry adult human radius bone in Belegavi region and its clinical significance</td>
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<td>105</td>
<td>IVACON-000067</td>
<td>Runjhun</td>
<td>Single centre morphometric study of sacral hiatus and its correlation with caudal epidural block</td>
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<td>106</td>
<td>IVACON-000080</td>
<td>Krishna G</td>
<td>Anatomical proximity between mitral valve annulus and circumflex artery – implications to mitral valve surgery</td>
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<td>107</td>
<td>IVACON-0000483</td>
<td>Shaheen Rizvi</td>
<td>Coccygeal sacralisation - a study</td>
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<td>108</td>
<td>IVACON-0000490</td>
<td>Sameeullah</td>
<td>Morphometric study of sacral hiatus and its clinical insinuation in the caudal epidural anaesthesia</td>
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<td>109</td>
<td>IVACON-000070</td>
<td>Meghana Joshi</td>
<td>A Cadaveric study on plantaris muscle with its clinical significance,</td>
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<td>110</td>
<td>IVACON-0000144</td>
<td>Amber Rana</td>
<td>Morphometry of Lateral Sural artery and its musculocutaneous perforators for designing Gastrocnemius muscle flaps : A cadaveric dye injection study</td>
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**Neuroanatomy-Room 6**

**Date:** 21.02.2021  
**Time:** 11:30 AM - 12:45PM  

**Chairpersons:** Dr. D R Singh, Dr. Medha Das, Dr B Prakash Babu

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<tr>
<td>111</td>
<td>IVACON-0000133</td>
<td>Geetika</td>
<td>Stereological estimation of the neurons of the left stellate ganglion after artificial myocardial hypertrophy in rats.</td>
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<td>112</td>
<td>IVACON-0000453</td>
<td>Sneha Gupta</td>
<td>Plasticity of the retinal horizontal cells under light of variable photoperiods and intensities</td>
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<td>113</td>
<td>IVACON-0000373</td>
<td>Meryl Rachel John</td>
<td>Distance between sulci/gyri of temporal lobe and temporal horn of lateral ventricle with its side and gender comparison in human cadaveric brains</td>
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<td>114</td>
<td>IVACON-0000317</td>
<td>Ekta Sharma</td>
<td>Anatomical study of p1 segment of posterior cerebral artery in adult Indian population</td>
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<td>115</td>
<td>IVACON-0000471</td>
<td>Rahul Rai</td>
<td>A Study on the Footedness as Marker of Brain Lateralization and Its Relation with IQ</td>
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<td>116</td>
<td>IVACON-0000402</td>
<td>Kushal Chakraborty</td>
<td>Cadaveric Morphometry Of Corpus Callosum In Chhattisgarh</td>
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<td>117</td>
<td>IVACON-0000309</td>
<td>Km Chetana Sharma</td>
<td>Morphological variations and morphometry of middle cerebral artery: A cadaveric study</td>
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<tr>
<td>118</td>
<td>IVACON-0000108</td>
<td>Ravi Shankar Prasad</td>
<td>Behavioral and Biochemical alterations in cerebellum of rats exposed to Sodium Arsenite</td>
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# Medical Education-Room 7

**Date:** 21.02.2021  
**Time:** 11:30 AM - 12:45PM  
**Chairpersons:** Dr. R K Dewan, Dr.Navbir PasrichaBedi, Dr.RashmiAvinashPatil

<table>
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<tr>
<td>119</td>
<td>IVACON-0000485</td>
<td>Shaguphta Tasnim Shaikh</td>
<td>Competency-based medical education: Implementation in basic sciences an overview</td>
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<td>120</td>
<td>IVACON-000013</td>
<td>Shilpa Bathla</td>
<td>Perceptions of M.B.B.S. Students Towards the Digitalization of Anatomy Education: A Cross-sectional Study in a Medical College of New Delhi</td>
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<td>121</td>
<td>IVACON-0000312</td>
<td>Shivani Garoda</td>
<td>Short protocol plastination of upper limb specimens- To study cross-sectional anatomy with corresponding CT – films.</td>
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<td>122</td>
<td>IVACON-0000178</td>
<td>Sushma Prabhath</td>
<td>Usefulness and Challenges of Medical Students towards ‘Image based OSPE’ for Assessing Practical Anatomy during a Pandemic</td>
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<tr>
<td>123</td>
<td>IVACON-0000493</td>
<td>Zafar Sultana</td>
<td>Perception of phase-I medical students towards online teaching during COVID-19 pandemic-An Institutional study</td>
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<tr>
<td>124</td>
<td>IVACON-0000274</td>
<td>Prajakta Kishve</td>
<td>Soft Embalming of Cadavers for Training Purposes: Our Experience</td>
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<tr>
<td>125</td>
<td>IVACON-0000494</td>
<td>Rashmi Malhotra</td>
<td>Students’ Perception of Online Anatomy Classes Compared to Traditional Classroom Teaching during COVID-19 Pandemic: An Institutional Study.</td>
</tr>
<tr>
<td>126</td>
<td>IVACON-0000524</td>
<td>Sruthi Sagar Borker</td>
<td>Issues, challenges and solutions related to Anatomy teaching and research after lockdown among Anatomy faculties in Gujrat state of India</td>
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### Gross Anatomy - Room 8

**Date:** 21.02.2021  
**Time:** 11:30 AM - 12:45 PM

**Chairpersons:** Dr. Sneh Agarwal, Dr. Sundarapandian, Dr. Shikky Garg

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<tr>
<td>127</td>
<td>IVACON-0000141</td>
<td>Hemamalini</td>
<td>Variant course and termination of brachial artery – a cadaveric study</td>
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<td>Meghana Joshi</td>
<td>Os Fabella of knee: A Cadaveric study</td>
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<td>129</td>
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<td>Vihangi A. Parekh</td>
<td>Morphological and morphometric study of foramen magnum in dry skulls and its clinical significance.</td>
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<td>IVACON-0000204</td>
<td>Rinke Choudhary</td>
<td>A Study of origin, termination and variations of the right coronary artery in the human cadaveric heart western Rajasthan population.</td>
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<td>IVACON-000083</td>
<td>Sachin Patil</td>
<td>Morphological variations of fissures and hilar structures of lungs and their surgical significance</td>
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<td>132</td>
<td>IVACON-000082</td>
<td>Sanjay Prasad Sah</td>
<td>A Morphometric Study of the Human Malleus</td>
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<td>133</td>
<td>IVACON-0000190</td>
<td>Awantika Thakur</td>
<td>Morphometric and morphological study of first rib and its clinical significance</td>
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<tr>
<td>134</td>
<td>IVACON-0000166</td>
<td>Amber Irfan</td>
<td>Morphometry of minor musculocutaneous perforators of Gracilis muscle: A cadaveric dye injection study</td>
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# Poster Presentation

**DAY-1**

**Scientific Sessions II**

**Gross Anatomy - Room 1**

**Date:** 20.02.2021  
**Time:** 3:30 PM - 4:15PM

**Chairpersons:** DR VANDANA TIWARI, DR RAKHI MILIND, DR FATIMA

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<td>IVACON-000071</td>
<td>Shobhit Shrivastava</td>
<td>Facio-Lingual Trunk</td>
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<td>Prashant Giri Goswami</td>
<td>High bifurcation of brachial artery: A case report</td>
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<td>IVACON-000097</td>
<td>Krati Bhadwaj</td>
<td>Surface variations of the liver and their clinical implications</td>
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<td>IVACON-0000112</td>
<td>Divya U</td>
<td>Unilateral absence of round ligament of femur – A rare cadaveric case report</td>
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<td>A Anbarasan</td>
<td>A unilateral double head of origin of flexor digitorum accessories longus - A case report</td>
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<td>IVACON-0000118</td>
<td>Janpreet Singh Kala</td>
<td>Ossified thyroid cartilage - A Case report</td>
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<td>Sushma Daripelli</td>
<td>A Novel Variation of Anterior belly of Digastric Muscle: A case Report</td>
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<td>IVACON-0000136</td>
<td>Sono Kumari</td>
<td>A Rare anatomical variation of musculocutaneous nerve</td>
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<td>Sumbul</td>
<td>Fusion anomaly in thoracic and lumbar vertebrae: A case report</td>
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**Gross Anatomy- Room 2**

**Date: 20.02.2021**  
**Time: 3:30 PM- 5:15PM**

**Chairpersons:** DR VANITA GUPTA, DR NAVEEN KUMAR, DR MAITRIYEE MUTALIK

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<td>Adya Priyadarshini</td>
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<td>Deepu Singh Katariya</td>
<td>Unusual variation in renal artery: A case report</td>
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<td>IVACON-0000159</td>
<td>Kalpana Gehlot</td>
<td>Unilateral alar thoracic artery: A case report</td>
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<td>Payal Kasat</td>
<td>Accessory slip of lateral head of gastrocnemius muscle with twig from CPN</td>
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<td>Fatima Bhopalwala</td>
<td>A variant branching pattern of arch of aorta encountered during routine dissection in anatomy</td>
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<td>Arunashri Acharya</td>
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<td>Bilateral Pterygo-Alar Bar And PorusCrotaphiticoBuccinatorius- A Case Report</td>
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<td>Vrindra Hari Ankolekar</td>
<td>Variation in the Formation of the Retromandibular and the External Jugular Veins with Embryological Overview</td>
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**Gross Anatomy - Room 3**

**Date:** 20.02.2021  
**Time:** 3:30 PM - 4:15PM

**Chairpersons:** NEERAJ KUMAR, DR NEETU ARORA, DR RASHMI JAISWAL

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<td>Unnamatla. Sudha Rani</td>
<td>An unusual variation of Axillary artery branching pattern.</td>
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<td>Satish Kumar Sharma</td>
<td>Anomalous superficial branch of brachial artery in the cubital fossa</td>
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## Gross Anatomy - Room 4

**Date:** 20.02.2021  
**Time:** 4:15 PM - 5:00PM

**Chairpersons:** DR INDRA KUMAR, DR CHANDANI GUPTA, DR MEDORA DSOUZA

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<td>Anterior Interosseous Nerve in relation to the surgically relevant landmarks</td>
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### Anthropometry - Room 5

**Date:** 20.02.2021  
**Time:** 4:15 PM - 5:00PM

**Chairpersons:** DR SUREKHA, DR ANAMIKA GEHARWAR, DR HINA SHARMA

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<td>Estimating body height of ulnar bone length in North Indian Population</td>
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<td>K Ramesh</td>
<td>Morphological and morphometric study of scaphoid bone and its clinical significance</td>
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**DAY-2**  
**Scientific Sessions IV**  
**Applied Anatomy & Imaging - Room 1**

**Date:** 21.02.2021  
**Time:** 3:30 PM- 4:15PM  
**Chairpersons:** Professor Farah Ghaus, Dr.SajuBinu Cherian, Dr Subhash Gupta

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<td>Dr Suresh Sharma</td>
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<td>Absent common hepatic artery and variant right hepatic artery-An incidental finding on CT imaging</td>
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<td>Pooja Gautam</td>
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Neuroanatomy - Room 2

Date: 21.02.2021  Time: 3:30 PM- 4:15PM

Chairpersons: R J Thomas, Dr. Vineeta Tewari, Dr. Jolly Agarwal

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## Histology - Room 3

**Date:** 21.02.2021  
**Time:** 3:30 PM- 4:15PM  

**Chairpersons:** Dr. Manisha Upadhyay, Dr. Sheetal B. Joshi, Dr AK Srivastava

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## Genetics - Room 4

**Date:** 21.02.2021  **Time:** 4:15 PM - 5:00PM

**Chairpersons:** Dr.Vidya CS, Dr.Seema R Khajuriya, Dr. Hema Malini

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<td>Balanced translocations in Recurrent pregnancy loss, by Cytogenetics</td>
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# Embalming & Medical Education - Room 5

**Date:** 21.02.2021  
**Time:** 4:15 PM - 5:00 PM  
**Chairpersons:** Shruti BN, Dr. Neeleshkanaskar, Dr. Vrindahari Kolekar, Dr. Prajaktakishve, Dr. Ashima das, Dr. Najma Mobin

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Dr Cecilia Brassett, University Clinical Anatomist, Human Anatomy Centre, Department of Physiology, Development and Neuroscience, University of Cambridge

Cadaveric dissection has been a key component of anatomy teaching for medical students at the University of Cambridge for centuries, as it provides considerable benefits in addition to the imparting of anatomical knowledge. This talk will first demonstrate how the required outcomes for medical graduates as stated by the General Medical Council in the UK can be achieved through cadaveric dissection, and then describe how this way of teaching can be incorporated into a blended learning programme. With the challenges posed by the COVID-19 pandemic, new strategies were devised to enable students to dissect in a COVID-secure environment, together with the implementation of interactive online teaching sessions. The current national lockdown, however, necessitated further adaptations as students were unable to return to the university. Despite these difficulties, it has been possible for cadaveric dissection to be retained in our course so that students can continue to enjoy the added value provided by this method of teaching.

2. Assessing public knowledge of anatomy through engagement: What do they know and what does it mean for anatomy education?

Dr Adam Taylor, Director of the Clinical Anatomy Learning Centre & Professor of Anatomy, Lancaster Medical School, Faculty of Health and Medicine, Lancaster University, UK

Anatomy is, and has been, the cornerstone of medical education for centuries. Whilst the methodologies of deliver have evolved during this time, it remains to be studied widely by health and allied health professionals. It is clear, especially in the current climate, that the need for anatomical education will continue to grow. Science more broadly is a not always studied or enjoyed by everyone, however, Anatomy has a unique edge on many other scientific disciplines given that every human on the planet possesses their own anatomy, which at some point, some piece of it will begin to fail driving the need to visit a healthcare practitioner. Face to face public engagement around the body is often limited to those who self-select for the interest and thus their knowledge may be at the more informed end of the spectrum. Undertaking a public engagement event in Lancaster around the human body gave the unique opportunity to assess what do the general public know about anatomy? Results showed that there is some areas of further education needed, for example only 2 out of 3 people could correctly locate the position of the heart. These results have led to a larger and more global study about “where are my body organs?”. This project hosted with the support of the Zooniverse, led to over 80,000 global participants highlighting the strengths of public engagement, citizen science and Anatomy to give a picture of many facets of anatomical knowledge across organs, structures and their geographical distribution and association with demographics.

In summary, there were some very interesting and surprising results, which showed that there is much work
still to do to educate individuals about their own anatomy, which in turn could save lives by enabling people to make informed decisions about their own health.

3. Ergonomics & Anatomy

D R Singh, Emeritus Professor, Department of Anatomy, King George’s Medical University, Lucknow

The ergonomics, a multidisciplinary term, is derived from two Greek words ‘ergon’ for “work” and ‘nomos’ for “laws of”. It means the study of man with respect to his work – and hence ergonomics is also known as “human engineering”. OSHA (Occupational Safety and Health Organization) describes ergonomic injuries while working and refers it to the interaction between work, worker, and workspace. Known in anatomy literature as ergastoplasm – perinuclear bluish material for ‘working’ component in cellular histology; and rough endoplasmic reticulum (RER) in electron microscopy is the physiological ergonomics. In addition, there are three more basic categories of ergonomics: (i) physical ergonomics – deals with human body’s responses to physical and physiological work demands since an anatomist is concerned with the shape, size, position, structure, blood supply, and innervation of a given body organ; (ii) cognitive ergonomics – that focuses on how well the use of a product matches the cognitive capabilities (or skills) of users and implies conscious intellectual activities; and (iii) organizational ergonomics – which is the newest variety and combines both the physical and cognitive domains. Office ergonomics looks at how workers can be more efficient and comfortable in their jobs. Bad ergonomics is responsible for discomforts, collectively grouped under office syndrome consisting different combinations such as eye hyperaemia (clinically known as eye redness), headaches, pain in shoulder, low back region (lumbago), and neck region. Good ergonomics is compatible with human anatomy and generally reduces the risk of musculoskeletal disorder injuries and minimizes or prevents problems caused by bad sitting postures.


Dr Sabita Mishra, Director Professor and Head of Anatomy, Maulana Azad Medical College, New Delhi

The neural tube is the developmental precursor of the central nervous system (CNS). Neural tube defects (NTDs) are among common birth defects, affecting approximately 1 in 1000 pregnancies, with a higher incidence in India. They occur when the neural tube fails to close completely during neurulation. The brain and / or spinal cord remains exposed to the extraembryonic environment resulting in, intrauterine neurodegeneration. NTDs comprise spina bifida, anencephaly, encephalocele, craniorachischisis, and iniencephaly. The underlying genetic and cellular mechanisms for these defects have not yet been understood. Several genes regulate the process of neurulation, but few have been successfully validated in humans. The sequence of neurulation occurs along the body axis. So both need to be studied simultaneously to understand NTD.

Formation of the brain and spinal cord begins with development of the neural tube, through the embryonic process of neurulation. The neural plate originates as a thickening of the dorsal surface ectoderm that folds up and fuses in the midline to create the neural tube. In mammals, neural tube closure initiates sequentially at different levels of the body axis. The most important pathway are the convergent extension with the planar cell polarity pathway, responsible for elongation of body axis and neural tube lengthening. They use a number of transcription factors, cyto skeletal elements, neuronal proliferation and apoptosis. Specific signaling pathways responsible for neural tube closure are SHH, BMP and Retinoid pathways. The sequence in the
mouse has been most intensively studied, where closure is initiated at the hindbrain/cervical boundary (Closure 1). Fusion then spreads bi-directionally into the hindbrain and along the spinal region. Separate closure initiation sites occur at the midbrain/forebrain boundary (Closure 2) and at the rostral extremity of the forebrain (Clos 3) completed by Day 25. The anterior neuropore. Progression of fusion (‘zippering’) occurs along the spine, culminating in final closure at the posterior neuropore, at the level of the second sacral segment Day 28. This completes the process of ‘primary’ neurulation (by neural folding). Formation of the spinal cord at lower sacral and caudal levels is accomplished by a different process, ‘secondary’ neurulation, in which a multipotential cell population in the tail bud (or caudal eminence: a derivative of the primitive streak at the caudal extremity differentiates to form cells of neural fate, which then organise themselves in the dorsal part of the tail bud to create a neuroepithelium surrounding a central cavity. This process, termed ‘canalisation’, yields a sacro-caudal neural tube whose lumen is continuous with the lumen of the primary neural tube more rostrally. Failure in closure leads to neural tube defects.

Underlying mechanisms of NTDs: Keeping the prevalence of NTDs in mind, their prevention assumes great importance. However, none of the strategies adopted till date (including folate supplementation in pregnant mothers) has been completely successful in doing so.

The Anatomy department of Maulana Azad Medical College has an established fetal autopsy lab, where fetuses are sent by the obstetricians and the autopsy findings are corroborated with USG findings which is used by them for planning of the future pregnancies.

With the advent of prenatal imaging, advanced precise molecular techniques, birth defects are diagnosed early. These advances should soon allow widespread prenatal screening for the majority of human genetic diseases, making it possible to treat/correct any anomaly prior to birth. Treatment of a disease in utero, by stem cell transplantation or gene therapy or surgery will enable the birth of a healthy infant.

5. Solving Clinical Problems with Anatomical Solutions

Tracey Wilkinson, Cox Chair of Anatomy, Director, Centre for Anatomy and Human Identification, School of Science and Engineering, University of Dundee

Dissection has been the backbone of learning anatomy for centuries, with the most common embalming fluids used in body preservation being formalin and ethanol, which leave the cadaver stiff and unyielding. At the University of Dundee, we moved to the Thiel embalming system approximately 10 years ago. Although slightly more expensive and requiring greater infrastructure in the form of large tanks, Thiel embalming retains the colour and flexibility of the cadaver, allowing a wider range of activities to be carried out. These activities include training of postgraduate doctors, testing of new medical devices, and enhancing the skill levels of undergraduate medical and dental students, who can benefit from the cadavers’ more versatile properties. Apart from dissection itself, skills that are useful to medical or dental students have been integrated in our anatomy classes to improve understanding. The students can then practise clinical anatomy and gain a better understanding of individual variation while carrying out the skill. Our Thiel cadavers are also being used as high fidelity simulation models for testing innovative medical devices, for postgraduate clinical and interventional skills training, and for development of novel surgical procedures.
6. Improving Surgical Training: Establishing a Surgical Anatomy Programme in Scotland

Ross Alexander Jones, Lecturer in Clinical & Surgical Anatomy, College of Medicine & Veterinary Medicine, University of Edinburgh

This presentation will describe our experience at the University of Edinburgh in the design and delivery of a surgical anatomy programme for Core Surgical Trainees (CST) in the NHS Scotland Deanery, United Kingdom. The surgical anatomy programme forms part of the wider Improving Surgical Training pilot introduced in the UK in 2018.

The objective of the programme was to provide all trainees with an opportunity to review the regional anatomy of the whole body to MRCS level at least once during their core surgical training. Teaching sessions were divided into head & neck, trunk and limb days, comprising overview lectures (principles, cases) followed by hands-on interactive demonstrations on prospected material in small groups. The emphasis throughout was on three-dimensional visualization in the applied setting, in relation to physical diagnosis and safe surgery. The CST surgical anatomy programme now forms a basis for higher surgical training (HST) sub-specialty study days.

7. Sonoanatomy of upper limb nerves

Dr Atul Gaur, Consultant Anesthetist, University Hospitals of Leicester, UK

Use of ultrasound mitigates the complexities of normal and abnormal variations in anatomy. This is advantageous hence recommended by various healthcare regulatory bodies while performing various interventions in order to accurately locate and plan a safe needle/instrument’s trajectory or approach to the target structure, and also to monitor the process of intervention in real time.

Anatomical variations of brachial plexus, median, ulnar and radial nerve are common. Use of ultrasound delineates the internal morphology, hence has improved the success rate and safety profile of upper limb nerve blocks. These anatomical variations can be easily identified and located on ultrasonography. The availability of ultrasound machines and its easy operability has made ultrasound guided nerve blocks popular.

Nerves have a fascicular pattern on ultrasound that can be easily confused with fibrillar pattern of tendons. Having said that the tendon shows significant length changes with movement across the joints, hence easily differentiated from the nerves that don’t change length. These can be readily appreciated in long axis ultrasound views of nerves and tendons/muscles. Nerves normally accompany vessels, both arteries and veins. The brachial plexus is arranged around artery, also a transverse cervical artery or thyrocervical trunk passes through the brachial plexus in posterior triangle of neck. Accidental injection of local anaesthetics inside the vessels is a high-risk complication of any nerve block. Ultrasound doppler helps in identifying such accompanying vessels, and a safer needle insertion line can be planned if vessels fall inside the plain of needle trajectory.

Certain medical illness like rheumatoid arthritis and/or aging process, have significant impact on internal and external morphology, and its inter-relationship.e.g., neck rigidity, scoliosis, muscle wasting etc. may make
normally adopted needle trajectory very difficult. Often patients acquire abnormal posture or twist or rotate the limb for the reasons of comfort and safety. These adopted body positions can alter the position of nerves and its relationship with various surface landmarks. Sonoanatomy knowledge and real time use of ultrasound helps in approaching target nerves in such difficult situations.

Dynamic ultrasound images in real time provides information about relative lie and movements with the adjacent structures like fascia, muscles, vessels and bones etc. The real time ultrasound also reveals the interaction of needle with the various tissues it traverses. It is important to avoid accidental intra neural injection of local anaesthetic during nerve block. Observing Glide sign prior to local anaesthetic injection has potential of avoiding nerve injuries.

Brachial plexus, median, ulnar and radial peripheral nerve morphology as seen on ultrasound will be covered in this presentation with the help of videos and still images for better understanding of the audience.
1. To study certain parameters of lower end of femur namely bicondylar width and inter condylar notch width at S.M.S. Medical College, Jaipur.

Dr. Chhavi Makker¹, Dr. Sangita Chauhan², Dr. Jitendra Singh³

**Background**: The knee joint is one of the major joints of our body and lower end of femur forms an important component of it. Knee joint is also commonly operated for replacement surgeries. Therefore, measurements of lower end of femur have great importance in designing of implants. Prosthesis based on accurate morphometric data plays a crucial role ensuring early mobility as well as fewer complications after arthroplasty.

**Aim**: To obtain data on certain parameters of lower end of femur namely bicondylar width (BCW) and inter condylar notch width (ICW).

**Objective**: To generate anthropometric data related to lower end of femur.

**Methods**: After applying inclusion and exclusion criteria 41 dried femur of each side (total 82) of unknown age and sex were selected for present study. The BCW and ICW were measured.

**Results**: In present study mean BCW was 74.1±5.18 mm on right side and 74.53±4.51 mm on left side. No statistical significant difference found between right and left side as the p value was > 0.605. In present study mean ICW was 22.6±2.44 mm on right side and 22.35±2.92 mm on left side. No statistical significant difference found between right and left side as the p value was > 0.620.

**Conclusion**: On comparison between right and left side measurements, no significant difference was found between values of parameters of right and left sided femur. This information will be useful to negate the need of side specific measurements for implant.

2. Anthropometry of Familial Short Stature Females of a City lie in Foothill of Himalaya

Karishma Sharma¹, Prashant Kumar Verma², Brijendra Singh³, Manisha Naithani⁴

¹PhD scholar, Department of Anatomy, AIIMS Rishikesh, ²Associate Professor, Department of Pediatrics, AIIMS Rishikesh, ³Professor & Head, Department of Anatomy, AIIMS Rishikesh, ⁴Additional Professor, Department of Biochemistry, AIIMS Rishikesh

**Background**: The accurate assessment of physical growth and development in children has attracted much attention from health care providers and pediatricians.

**Aim & objective**: This study was undertaken to find out the relationship between various body parameters to identify the measurement that correlates most closely to stature.

**Method**: In present study 42 Familial short stature females age 5-18 years was screened in Pediatric OPD, AIIMS Rishikesh for height, weight, arm span, head circumference, Cephalic index was measured to find out relationship between them.

**Result**: All the data was collected and analyzed in R 3.6(base package) to find correlation coefficient, p-value and 95% confidence interval (CI). There was significant co-relation (r) between height (standing, sitting) and
weight r-0.8, p-value- 7.42E-10, Confidence interval- 0.6- 0.9. weight_height_sit r-0.8,p-value 4.72E-09, Confidence interval - 0.6- 0.9 respectively. Significant co-relation between arm span and height (standing, sitting) r-0.9, p-value-3.91E-15,CI-0.8-0.9,r-0.8,p-value-2.69E-12,CI- 0.7- 0.9 respectively.BMI and height was not significantly correlated.Cephalic index and height, head circumference was also not significantly correlated.

Conclusion: These parameters can be used by endocrinologist and pediatricians, geneticist health care providers as this data for short stature female is not available as best of my knowledge for the city (Rishikesh).

3. Morphometric Study of Ear Lobule and Age Related Changes.

Dr. Rakesh Swami¹, Dr. Chandrakala Agarwal², Dr. Dhiraj Saxsena³, Kariti Bhardwaj⁴.

Background: Ear lobule is important structure of human ear. It is non cartilaginous & has large blood supply and may help to warm the ear. It shows changes in length & breadth with age progression.

Aim & Objectives: The Study is conducted to get Average value (Length & Breadth) of bilateral ear lobule in different age group & to understand age related changes from 1 year to 75 year old male population & to know variation B/W both lobules. Females are excluded from this study because of ear piercing.

Method & Result: Study done in 100 Random people divided into 10 groups according to their age every group have 10 people. Mean calculated by direct method & measurement of lobule taken with the help of vernier caliper.

In a group of 100 people age from 1 year to 75 year Rt. ear lobule mean length is 17.5 mm & Mean Breadth is 21.7 mm and in left ear lobule mean length is 17.8 mm & Breadth is 21.32.

Conclusion: The present study showed that B/L ear lobule increase in length & Breadth with Age Progression. Breadth of ear lobules increase up to the age of 15 years then almost remains static up to the age of 30 years. It starts increasing again 31 year onwards.

Length of B/L ear lobules mainly increase in 16 to 20 and 31 to 45 age group then length again increase in old age 56 to 75 year age group.

Bilateral ear lobules have variation in length & Breadth in most of the people compared to each other.

4. An Anatomical study of Lumbosacral Transitional Vertebra

Dr. Sharad kumar Pralhad Sawant, Professor and Head, Dr. Shaheen Rizv, Department of Anatomy, K. J. Somaiya Medical College, Somaiya Ayurvihar, Maharashtra University of Health Sciences, Nashik, Maharashtra.

Background: Lumbosacral transitional vertebrae are congenital anomalies of the lumbosacral region which include sacralisation of fifth lumbar vertebrae and lumbarization of first sacral vertebrae. Lumbarization occurs when the uppermost segment of the sacrum is not fused to the rest of the sacrum but instead it is partially mobile constituting an 'extra' lumbar vertebra, often referred to as L6. Sacralization is described as having one fewer lumbar vertebra because the last lumbar segment (L5) is fused to the sacrum.

Aims and Objectives: To study the incidence of lumbarisation and sacralisation.

Material and Methods: A study was conducted in the Department of Anatomy of K. J. Somaiya Medical College in which hundred adult dry human sacra were examined.
**Results:** 28% specimens showed anatomical anomalies of lumbosacral transitional vertebrae out of which 16% showed anomalies of lumbarisation and 12% showed anomalies of sacralisation. The specimens showing lumbarisation and sacralisation were studied in detail.

**Conclusions:** Sacralization of L5 vertebra is more common than lumbarization. The incidence between these anomalies is 2:1. Mutations in the HOX 10 and HOX 11 paralogous genes affect the normal patterning of lumbar and sacral vertebra. The consequences of the sacralisation may be the degenerative spondylolisthesis, disc herniation, low back pain and disc degeneration. Identification of lumbosacral transitional vertebrae (LSTV) is crucial for precise resolution of the number of vertebrae.

5. **Study on morphology and morphometric of mental foramen in dry human mandibles of Rajasthan’s population of India.**

**Surekha Waghanna¹, Neelkant Patil²**
Professor, department of anatomy, Rajasthan Vidyapeeth homeopathic medical college and hospital, Dabok, Udaipur, Rajasthan.
Professor, department of oral medicine and radiology, Rajasthan dental college and hospital Jaipur.

**Background:** The mental foramen is the entire funnel-like opening, situated in anterolateral aspect of the mandible which transmits mental nerves and vessels. The mental foramen is an important landmark to facilitate diagnostic, surgical local anaesthetic and other invasive procedures.

**Aims & Objective:** To Study morphological and morphometric analysis of mental foramen.

**Materials and Methods:** 50 dry adult human mandibles of unknown age and sex were determined by using digital vernier calliper.

**Results:** Bilateral mental foramina were observed in all fifty mandibles (100%). Accessory mental foramina were found. Shape of MF was round in 68 % and oval in 32 %. A mean diameter of horizontal MF was measured as 2.3 on right and 1.8mm on left and vertical diameter 1.8mm on right and 1.7 mm on left respectively. Various parameters investigated are, the horizontal distance between (1) symphysismenti and MF was 25.1 mm on right and 24.9 mm on left, (2) MF and posterior border of ramus was 61.1 mm on right and 61.2 mm on left, vertical distance between (3) MF and inferior border of mandible was 11.3 mm on right and 11.2 mm on left (4) alveolar crest and MF was 12.2mm on right and 11.9 mm on left respectively.

**Conclusion:** The present study suggest that the morphometric measurement of mental foramen may be useful for surgeons, anaesthetists, anatomists, forensic scientists and dentists to carry out nerve block and surgical procedures like curettage of mandibular premolars, periodontal surgery etc.to avoid injury to neurovascular bundle.

6. **Morphometric study and clinical application of proximal end of humerus**

**Dr. Jai Krishnan D.,** 1st year Postgraduate student, Department of Anatomy, Goa Medical College, Bambolim, **Dr Fatima Maria De Souza,** Associate Professor and Officiating Head, Department of Anatomy, Goa Medical College, Bambolim

**Background:** Shoulder joint dislocation and fracture of proximal end of humerus are common injuries and for better understanding, morphometry of the proximal end of the humerus is important. This study will be of help to orthopedic surgeons, radiologists, anthropologists, and forensic experts.

**Aims and Objectives:** To measure and analyze various parameters of proximal end of humerus.

To determine the differences between parameters of proximal end of left and right side humerii.
Materials and Methods: 60 dry adult humerus (31 left and 29 right) were studied. The parameters were measured using osteometric board, digital vernier calliper, measuring scale and coloured thread.

Results: Mean length of humerus is 30.9cm ± 1.41 on left and 31.1cm ± 1.65 on right, mean humeral head vertical diameter is 40.54mm ± 3.1 on left and 40.38mm ± 3.51 on right, mean humeral head transverse diameter is 37.84mm ± 3.52 on left and 38.2mm ± 3.8 on right, mean distance between humeral head and greater tubercle is 16.77mm ±2.79 on left and 17.5mm ± 2.96 on right, mean anatomical neck circumference is 12.69cm ± 0.74 on left and 12.89cm ±1.12 on right, mean surgical neck circumference is 8.32cm ± 0.67 on left and 8.74cm ±0.97 on right, mean distance from lateral lip to medial lip of bicipital groove is 8.94mm +1.64 on left and 9.37mm +1.6 on right.

Conclusion: morphometric analysis of the proximal end of humerus in Indian population paves the way for a better understanding of the functional aspects of proximal end of humerus.

7. Morphological study of sacral hiatus in dry human sacrum in Udaipur district.
Dr. Lekhni Vyas, Dr. Ghanshyam Gupta, Dr. Seema Prakash, Dr. Sushant Vanawat, R.N.T. Medical College, Udaipur, Rajasthan.

Background: Sacral hiatus is an important landmark used during caudal epidural anesthesia or block (CEB).

Aim and objectives: Present study was planned to study the various shapes and location of apex and base of sacral hiatus with respect to sacral vertebrae.

Material and methods: Descriptive type of observational study was conducted on 80 dry human sacra in the department of Anatomy, R.N.T. Medical College, Udaipur. Morphological features such as shape of sacral hiatus, level of apex and base of sacral hiatus with respect to sacral vertebrae were observed.

Results: It was found that out of total studied sacra 53.75%, 27.50%, 11.25%, 5%, and 2.5% were having Inverted V, Inverted U, Dumbbell, Irregular and Spina Bifida shaped of sacral hiatus respectively. When level of apex and base of sacral hiatus with respect to sacral vertebrae were studied, apex was mostly present at the level of 4th sacral vertebra (47.44%) whereas most common (92.31%) location of base of sacral hiatus was at the level of 5th sacral vertebrae.

Conclusion: Sacral hiatus is an important landmark used for the successful caudal epidural anaesthesia. Thus the exact localization of the sacral hiatus would help in easy placement of needle into the hiatus

8. Morphologic and morphometric analysis of human talus

Background: Talus is an intercalated bone with no tendinous attachments. It is the osseous link between foot and leg through talocrural joint. Subtalar joint involves concave posterior calcaneal facet on the posterior part of inferior surface of talus and convex posterior facet on the superior surface of calcaneum. Talus is involved in weight bearing and transmission of weight through these joints and subjected to modifications due to changes in direction of forces while adapting different postures.

Aim and Objectives: To analyse patterns of calcaneal facets of talus; presence of squatting facets on dorsum of head of talus and co-relation of squatting facets with different angles of neck of talus.

Methods: 100 dry tali (50 left, 50 right) of unknown sex were analysed for the patterns of calcaneal facets. Angle of Deviation (AD) and Angle of Inclination (AI) were measured with Goniometer. Presence of squatting facets were also noted.
Results: The percentage of type II facets were the highest, followed by type I and V. Type III and IV were seen in a very few tali. Squatting facets were observed on 52% of right and 42% of left tali. Average AD & AI were 29° & 130° respectively. AI in tali with squatting facets was high. No significant co-relation is seen between squatting facets and AD.

Conclusion: The patterns of calcaneal articular facets and modification in angle of neck of talus are attributed to differences in racial, genetic, environmental & occupational factors.


Krati bhardwaj¹, Dr. Chandrakala agarwal², Dr. Dhiraj Saxena³.

Background: The present study was conducted for analysis of the morphometry shape and determination of sex by foramen Magnum.

Aim: Morphometric analysis of foramen magnum in dry human skull.

Objective: To generate anthropometric data related to foramen magnum (FM) in dry human skull.

Methods: After applying inclusion and exclusion criteria 30 dried human skull of unknown age and sex were selected for present study. All 30 cranial bases were visually assessed for FM shape classification. Each FM shape was classified into one of the 8 types: oval, egg, round, tetragonal, pentagonal, hexagonal, combination of 2 different semicircles and irregular. The Anteroposterior diameter, Transverse diameter, Area of foramen magnum and index of foramen magnum were measured.

Results: The mean anteroposterior diameter of foramen magnum male and female skull bones were found to be 37.17±1.76 mm and 33.92±3.50 mm respectively. The mean transverse diameter of foramen magnum in male and female skull bones were found to be 29.49±2.68 mm and 29.38±2.47 mm respectively. The mean area of foramen magnum male and female skull bones were found to be 818.05±119.66 mm² and 847.57±105.85 mm² respectively. The mean index of foramen magnum in male and female skull bones were found to be 84.00±5.41 and 80.27±5.79 respectively. Overall skull bones showed a medium type of foramen magnum index.

Conclusion: We concluded that the several anatomic parameters of foramen magnum should be taken into consideration during surgery involving the craniovertebral junction, use during forensic and anthropological investigation of unknown individuals for determining gender, ethnicity, etc.

10. Cranial Anthropometry and cephalic index in new born of West Bengal

Anasuya Ghosh¹, Tapan Sinha Mahaputra²
1. Dept of Anatomy, All India Institute of Medical Sciences, Kalyani. 2. Dept of Paediatrics, RG Kar Medical College, WB

Background: Anthropometry is a process of measuring human body dimensions and precise measurements of head is done in cranial anthropometry. The value of cranial parameter varies across races and geographical location. These parameters are useful to diagnose and treat cranial dysmorphologies in a particular population group.

Aims and Objectives: To obtain the measurements of cranial parameters including head length, head width and head circumference in new born babies to obtain a dataset of these parameters. We wanted to compare if there is statistically significant difference in above parameters between male & female newborn population.

Methods: After obtaining ethics committee clearance the study was conducted at nursery, Dept of Paediatrics
of RGKar Medical College and Hospital, WB on 24-48 hour old new born with appropriate consent from the parents. The total 1571 newborn were measured by a single investigator across a period of 1 year and 6 months. The data were analysed using Epicalc2000 software.

**Results:** We obtained the range and mean value of all the parameters in new born. The cephalic index in new born male and female were 76.17 and 76.78 respectively. No statistically significant sexual dimorphism was observed. The head length and head width were statistically significantly higher in normal birth weight babies than low birth weight ones.

**Conclusions:** These data set was lacking for newborn population in West Bengal and it could be useful in clinicians for early diagnosis of dysmorphogenesis in infants.

11. **Determination of sex from mastoid process of dry human skulls of Dakshina Kannada by deriving discriminant function equation.**

**Jayalakshmi.P.V**¹, **Qudusia Sulthana**², **Shivarama Bhat**³

PG¹, Associate professor², Professor & HOD ³, Department of Anatomy, Yenepoya Medical College, Yenepoya University, Mangalore

**Introduction:** Sex determination is vital for the identification of an individual. Often fragmentary remains are available for forensic identification making sex determination difficult. The mastoid region, a fragmentary piece of skull, is ideal for studying sexual dimorphism as it is resistant to damage due to its anatomical position at the base of skull. It is often difficult to identify sex in fragmented remains, as no isolated characteristic of any particular bone can perfectly determine the sex of a skeleton. Therefore, it becomes essential then to observe the sex-specific characteristics from as many bones as possible.

**Aim:** The purpose of this study is to develop new standards for the determination of the sex of fragmentary human skeletal remains using the mastoid process.

**Objectives:**
- Determination of sex from mastoid process length, breadth, Antero Posterior diameter and mastoid process size
- Derivation of Discriminant function equation

**Materials & methods:** The present study is a cross sectional study, conducting at Yenepoya Medical College, Mangalore. Measurements of mastoid process will be taken from the 85 dry human skull from Department of Anatomy, Yenepoya Medical College. The four parameters taken were 1. mastoid length 2. mastoid breadth 3. mastoid size 4. mastoid antero-posterior diameter. After collection of data the equation was derived by using statistical analysis.

12. **Morphometric and Morphological Study of First Rib and its Clinical Significance.**

**M.Raj Anand, T. Anitha, V. Srinivasan**

Department of Anatomy, Government Kilpauk Medical College, Chennai.

**Introduction:** The first rib is an atypical rib and it takes part in formation of bony boundary for inlet of thorax. The Neurovascular structures related to superior surface of the first rib include the lower trunk of brachial plexus & subclavian vessels. The significant landmarks in first rib include the head, tubercle and vascular grooves. Anomalous ribs including the cervical ribs, bifid ribs, rib dysplasia, and intercostal fusion discovered incidentally on chest radiographs may be associated with the compression of the neurovascular bundle at root of neck. And hence a study on first rib is done.
Aims & Objectives: To analyze the morphometrical and morphological study of first rib and its clinical significance.

Methods: 50 dried adult human first ribs were obtained from Department of Anatomy, Govt Kilpauk Medical College, Chennai. Morphometric measurements were done using digital vernier calipers.

Parameters include,

1. Total exterior length, from sternal end to head,
2. Interior length from sternal end to head,
3. Presence or absence of scalene tubercle,
4. Presence or absence of subclavian groove.

Results: Datas will be shown at time of presentation.

Conclusion: Malformations of first rib are common. When present, it may lead to compression of neurovascular bundle at root of neck causing thoracic outlet syndrome. Awareness of such anomalies are important for Anatomists, Radiologists, and Thoracic Surgeons.

13. Taxation of Micronuclei frequency as a prognostic marker in Oral and oropharyngeal carcinoma - A cytogenetic study

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Introduction: Oral and oropharyngeal carcinoma are one among the commonest cancers in the world. India shares about 1/4th of incidences of oral and oropharyngeal cancers and death due to the same is also of significant number. Micronucleus resulting from aberrant mitosis, chromatin fragmentation or aberrant chromosome is considered as a hall mark for genotoxicity also oral cancer risk and useful in chemo-preventive studies. So determination of micronuclei frequency serves as better prognostic marker.

Materials and method- 60 patients with mean age of 53(56 males & 4 females) years, who were histopathologically confirmed cases of Oral and oropharyngeal carcinoma with different degree of differentiation were recruited for the study. Patients were solely treated by radiotherapy with radiation dose plan of 4Gy, 14Gy, 24Gy and 60 Gy on 2nd, 7th, 12th & 30th day respectively. The mucosal scrapings stained with Giemsa & May-Grunwald’s stain were studied to assess the micronuclei at each interval

Results- Although there was no significant association between site of lesion and tumour differentiation with micronuclei index, there was statistically significant difference in the micronuclei index with at each interval. Percentage of relative increment in micronuclei also shows promising significance.

Conclusion- Hence micronuclear assay could be used as an efficient tool to determine the radiosensitivity and prognosis in oral and oropharyngeal carcinoma patients treated by radiotherapy.
14. Profile of Musculoskeletal Anomalies at a Tertiary Care Hospital: An Autopsy Based Study

Dr. Vinutha S. P1, Dr. Narayanappa D2, Dr. Manjunath G V3

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Background: Musculoskeletal anomalies refer to the structural or functional abnormalities of both the muscles and the skeleton which occur during the intrauterine developmental process.

Aims and Objectives: To determine the pattern of distribution of musculoskeletal anomalies among stillborn fetuses through an autopsy study. The objective of the study was to find out an association between maternal factors, fetal factors, and congenital anomalies.

Methods: This descriptive, cross-sectional study consists of 50 stillborn fetuses. The fetuses were collected from the Department of Obstetrics and Gynecology, JSS Hospital, Mysore. The fetus was fixed in 10% formalin and formalin was injected into the thoracic cavity, abdominal cavity, and cranial cavity for fixation of the organs. The autopsies were performed as per standard fetal autopsy protocol. The musculoskeletal anomalies were studied in detail.

Results: Out of the total 50 stillborn fetuses studied, musculoskeletal anomalies were observed in about 10 stillborn fetuses (20%). Among the 10 fetuses, 4 were male and 6 were female and the ratio of male to female is 2:3. The polydactyly was the most common musculoskeletal anomaly observed in the present study. The other anomalies documented were congenital talipes equino varus (CTEV), syndactyly, amniotic band syndrome, kyphoscoliosis, thanatophoric dysplasia, and sirenomelia.

Conclusion: This study confirms the utility of fetal autopsy in identifying the cause of fetal loss which will help in counseling the couple for future family planning. For the better future of neonates, early recognition of correctable lesions is essential, which demands a systematic approach to the study of musculoskeletal anomalies.

15. Sperm DNA Fragmentation: An Important landmark of male infertile

Manisha B Sinha

All India Institute of Medical sciences, Raipur, CG

Background: Infertility is no more curse among married couples because of available solution. The Male factor contributes to around one third of all cases of infertility. The knowledge of qualitative change in sperm along with quantity is important for fertilization to occur thus for the pregnancy. The aim of this study is to determine the prevalence of sperm DNA fragmentation index with sperm chromatin dispersion test.

Method: The Study was carried out in semen sample given for routine check-up in All India Institute of Medical Sciences, Raipur. Hundred infertile couples and twenty-five couples with known fertility were enrolled in the study. Sperm Count and sperm DNA fragmentation index (DFI) were calculated. The sperm DNA fragmentation was determined by SCD test by kit method.

Results: Finding will be discussed during presentation.

Conclusion: Sperm DNA fragmentation in an important landmark for assisted reproduction technology. Sperm DFI at cut off value 27% has higher diagnostic significance.

Prof. Shayama K. Razdan, Dr. Shalini Kumar, Dr. Priyanka Rana

**Background:** The available literature reveals controversy regarding themorphometry and vascular pattern of the placenta.

**Aims & Objectives:** To study morphometry of placentae and to observe vascular pattern & diameter by placental vascular corrosion cast technique.

**Methods:** Placental morphometric study was conducted on 40 specimens in the department of anatomy, HIMS, New Delhi. After the formation of placental vascular cast model, vascular pattern and diameter were noted.

**Result:** Mean placental weight was 585g. Mean of placental size (diameter) was 20.10cm. Meanplacental thickness (central & peripheral) was (16.95mm & 7.74mm), respectively. Most commonshape observed was oval (51.16%). Most common type of cordattachment found was eccentric (67.4%) and least seen as Velamentous (2.32%).Vascular cast study of the placentae showed three types of patterns, mostcommon pattern seen was Mixed type followed by Magisterial & Dispersed. Mean Diameterof UA 1 & 2 was 0.42cm & 0.357cm, respectively. Mean diameter of umbilical vein was 0.661cm. Statistical analysis of diameter of main umbilical artery 1 and 2 (UA 1 & UA 2) was significant.

**Conclusion:** Maximum & minimum placental weight, placental diameter, central placental thickness, peripheral placental thickness, UA1, UA2 and UV diameter was 850 & 320g, 24 & 12cm, 29.76 & 5.16mm, 17.74 & 1.1mm, 0.7 & 0.2cm, 0.68 & 0.025cm and 1.2 & 0.2cm, respectively. Most common placental shape and type of cord attachment was oval and eccentric, respectively.

17. Morphometric analysis of human fetal liver at different gestational ages.

Kavita Modi1, Dr Pooja Bhadoria2.

1. MSc second year, Department of Anatomy, AIIMS, Rishikesh. 2. Assistant Professor, Department of Anatomy, AIIMS, Rishikesh.

**Background:** Fetal liver plays important significant roles of connection and transient hemopoietic functions. Gross development of caudate and quadrate lobe differentiates embryonic liver from fetal liver. This study is performed on morphological parameters.

**Aims & Objectives:** To assess development of human fetal liver by morphometric analysis at different gestational ages.

**Materials and Method:** We studied 20 human fetal livers of gestation age ranging from 12-36 weeks. These were categorised in three groups namely group A (12-20 weeks), group B (21-28 weeks) and group C (29-36 weeks). The studied was conducted in department of anatomy AIIMS, Rishikesh in collaboration with department of Obstetrics & Gynecology, AIIMS, Rishikesh. For this, fetal liver weight, volume, sagittal diameter, transverse diameter, vertical length was measured. Mean and standard deviation of groups were calculated and correlated with gestational ages.

**Results:** The mean of Transverse diameter of group A, B and C were 4.23, 4.28 and 6.03 with standard deviation of 0.5, 0.46, 2.69 respectively. The mean of sagittal diameter of group A, B and C were 1.43, 1.61, 2.3 with standard deviation of 0.1, 0.48 and 0.24 respectively. The mean of vertical length of group A, B and C were 7.9, 3.5 and 6.56 with standard deviation of 11.77, 0.68 and 0.40 respectively.

**Conclusion:** In reference to this study, these parameters are helpful in diagnosing various congenital and gross
18. Gross morphological study of placenta in normal and IUFD cases

Dr.Kalpana Gehlot, Dr. Sushma K. Kataria

**Background:** The intrauterine life of fetus is dependent on one important vital vascular organ termed placenta. There are various foetal death causes which include foetal cause (25-40%), placental causes (25-35%), maternal causes (5-10%), and in 25-35% cases causes are unknown. Examination of placenta after foetal death is more important and mandatory as it gives precious information for management of mothers having complications associated with IUFD. Present study was aimed to find out morphological changes in placentae of IUFD cases and to establish their relationship with various disorders.

**Aims and objectives:** Present study was aimed to find out whether changes are present in morphology of placenta in cases of intrauterine fetal death and to establish their relation with various metabolic disorders like anemia, pregnancy induced hypertension, and gestational diabetes.

**Material and method:** 140 placentae (70 normal and 70 IUFD) were studied in department of Anatomy, Dr. S.N. Medical College, Jodhpur Rajasthan, and their weight and shapes were observed.

**Result:** Most common observed shape of both normal and IUFD placentae were discoidal to oval. Average weight of normal placentae was 444g whereas it decreases to 230g for IUFD placentae. Average weight of IUFD placentae without metabolic disorder or with metabolic disorder like anemia, diabetes, hypertension were observed 220, 260, 280 and 265 g respectively.

**Conclusion:** Placental parameter like shape, weight, thickness, diameter, area and circumference significantly decrease in IUFD cases as compare to normal full-term placentae. Thus, placental changes show strong association with fetal outcome. The knowledge of these measurements on the placenta will be helpful to obstetrician in clinical practice.

19. Frequency Electromagnetic Radiation (RF-EMR) produced by 4G mobile phone on male S.D rats Fertility and Ameliorating effect of Punica Granatum juice

B. Anjaneyababu Naik, Dr.Sridevi N.S

Sri Devaraj Urs Academy of Higher Education and Research

**Background:** During recent years, an increasing percentage of male infertility has to be attributed to an array of environmental, health and lifestyle factors. Male infertility is likely to be affected by the intense exposure to radiations. Pomegranate fruit is inescapably linked with fertility.

**Aims and Objectives:** To study the effect of mobile RF-EMR on sperm parameters and ameliorating effect of pomegranate juice in male Sprague Dawley (S.D) rats.

**Method:** Thirty healthy male S.D rats were divided in five groups (n=6): Control group (I), RF-EMR group (II) exposed to 4G mobile for 3 months. RF-EMR and Pomegranate juice (PJ) group (III) exposed to radiation like group II concomitant with PJ through orally. While RF-EMR Recovery Group (IV) exposed to radiation for 3 months then kept unexposed for recovery. Pomegranate juice group (V) rats are PJ juice administered orally. Epididymal sperm parameters were measured.

**Results:** The RF-EMR group exhibited a significantly reduced sperm count, sperm viability, sperm motility, progressivity and morphology when compared to control group. However, the pomegranate juice group showed significant elevation in sperm parameters. On the other hand, the recovery group showed slightly improvement of sperm parameters.
Conclusion: Exposure to 1800-2400MHz RF-EMR leads to negatively effects of Semen parameters could cause male fertility. However pomegranate juice administration was protective.

20. A Morphometric Study of Human Foetal Pancreas and Correlations with its Embryogenesis

_Jakhar Bharti, Malhotra Rashmi, Singh Brijendra_

All India Institute of medical Sciences, AIIMS Rishikesh Uttarakhand

Introduction: Diabetes currently afflicts about 200 million people all over the world. Study of development and morphology of foetal pancreas may help in ongoing research and throw some light on its role during embryogenesis and future involvement in the disease.

Aim and Objectives: The study aims to conduct morphometric analysis of human foetal pancreas in grossly normal and abnormal foetuses and its correlation with pancreatic development at different gestational age.

Material and Methods: The study was performed on 15 spontaneously and induced aborted foetuses collected from department of Obstetrics and Gynaecology, AIIMS Rishikesh after a detailed history and proper consent. Age of foetuses ranged from 11 to 40 weeks as calculated by maternal history and ultrasonography. Foetuses were collected in 10% formalin immediately after abortion or medical termination of pregnancy. Gross foetal appearance was noted and foetal autopsy was done. Various morphometric parameters of foetal pancreas such as gross appearance, weight, length, thickness of different regions of pancreas were noted and tabulated.

Results: The morphometry of foetal pancreas shows changes in grossly normal as compared to grossly abnormal foetuses at different gestational age.

Conclusion: Any gross abnormality in foetuses due to congenital or medical conditions will affect the pancreas, which may be explored further by histological and embryological studies.

21. Study of correlation between neonatal and placental weight in normal and PIH pregnancy.

_Ramesh P. Assistant Professor, Department of Anatomy, Sri Siddhartha medical college, Tumakuru._

Background: Pregnancy-induced hypertension (PIH) is one of the most common complications in pregnancy leading to placental insufficiency which in turn lead to foetal morbidity and mortality.

Aim and objectives: To study the mean placental weight, mean neonatal weight and correlation between the neonatal and placental weight.

Materials and methods: The study was conducted in the Department of Anatomy, SSMC, Tumakuru. A total of 100 (50 normal and 50 PIH) formalin-fixed human placentae were studied. Placental weights, neonatal weight in grams were measured and the correlation between neonatal and placental weight in normal and PIH pregnancy were studied. The study was analyzed by the unpaired t-test and correlation coefficient.

Results: The mean placental weight and the mean neonatal weight were decreased in PIH pregnancy. A positive correlation between placental weight and neonatal weight was found in the present study.

Conclusion: Study reveals, PIH cause decrease in uteroplacental blood flow which reduces the placental weight and in turn affects foetal nutrition ultimately decreasing the neonatal weight. Hence there is a direct correlation between neonatal weight and placental weight.
22. Macroscopic study showing teratogenic effect of propylthiouracil on fetal organs of Swiss albino mice

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**Background:** Teratology is the study of abnormal prenatal development and congenital malformations induced by exogenous chemical or physical agents. Propylthiouracil (PTU), an antithyroid drug is used in the Graves’ disease induced hyperthyroidism. Among antithyroid drugs, Propylthiouracil currently is recommended as the drug of choice during early pregnancy, as formal studies of teratogenicity have yet to be performed.

**Aims & Objective:** To study the teratogenic potential of Propylthiouracil by macroscopic examination of fetal organs of Swiss albino mice.

**Material & Methods:** The drug was given orally in a dose of 150 mg/kg/day from 6-8th day of gestation to pregnant Swiss albino mice. Similarly, distilled water was used as vehicle in control group. The pregnant mice were sacrificed on 18th day of gestation by cervical dislocation and the fetuses were dissected out by uterotomy. The fetal organs (i.e. liver, kidney etc.) were dissected out, weighed and observed for gross malformations.

**Result:** On macroscopic examination, there were reduction in size and weight of the various fetal organs of treated group.

**Conclusion:** Propylthiouracil shows degenerative effect on various organs when given during period of organogenesis, so it should be cautiously used in first trimester of pregnancy.

23. Cytogenetic study in children with acute leukemia and its correlation with clinical presentation in north Indian region

Surendra Kumar Yadav, Archana Rani, R K Verma, Garima Seghal

Department of Anatomy, KGMU

**Introduction:** Acute leukemia affects mostly children. It is of two types-Acute lymphoblastic leukemia (ALL) and acute myeloid leukemia (AML). It occurs due to abnormal proliferation of white blood cells in bone marrow or other tissues. The causes are multifactorial. It is associated with various structural and numerical abnormalities. The clinical presentation were generally present with nonspecific clinical features including fever, pallor, rashes, lymphadenopathy, joint pain.

**Aims and Objectives:** To observe cytogenetic abnormalities in children with acute leukemia and correlate it with clinical features.

**Material and methods:** For the present study, peripheral blood samples were collected from 50 patients screened for acute leukemia, age group of 0-17 years in Department of Pediatrics oncology. Informed consent was taken from their parents/guardians and while collecting samples, detailed personal history, family history and thorough clinical examination was done. The study was conducted in the Cytogenetic laboratory of the Department of Anatomy in collaboration with C.F.A.R, King George’s Medical University U.P., Lucknow.

**Result:** Of all the cases of acute leukemia. Translocations were the only structural anomalies observed. t(12;21) was the most common structural abnormality (17.5 %) followed by t(1;19)(10%), t(9;22)(7.5%) and t(9;11)(5%) respectively. Hyperploidy was the only type of numerical anomaly observed in 10% of cases.
Conclusion: In association with structural abnormalities fever and lymphadenopathy were seen in equal proportion of children followed by pallor, joint pain and rashes and in numerical anomalies fever, lymphadenopathy and pallor was seen in equal proportion followed by rashes and joint pain.


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1Advanced Genomics Institute & Laboratory Medicine (AGILE), New Delhi, 2IILM College of Engineering and Technology Gr. Noida and 3King George Medical University, Lucknow

Background: Preimplantation genetic testing (PGT) enables screening of embryos for genomic abnormalities thereby improving the chances of successful pregnancies. PGT has been applied to patients carrying chromosomal rearrangements, single gene disorders, repeated pregnancy loss etc. to increase the implantation rates and reduce the incidence of spontaneous abortions.

Aims & Objectives: Our aim is to review the progress of PGT since its inception in terms of its applications, methodologies used and outcomes.

Material and methods: We have reviewed literature and publications to track the developments in the preimplantation screening methods and techniques. There is an increased awareness and acceptance of the PGT in Indian setting as well and it has been incorporated in the protocols of several IVF providers. We have reviewed the various offerings of different companies to understand and present the gamut of PGT options available presently.

Results and conclusions: PGT methods and techniques have come a long way with the development of various technologies in embryology and diagnostics. In the embryology side, the development of lasers for biopsies has made the procedure more simple, safer and effective. In the diagnostic side, PGT has moved on to the molecular methods such as Microarrays and Next Generation Sequencing (NGS) whereas the older techniques of FISH and PCRs have gradually become outdated. The newer molecular techniques (Arrays, NGS) enable a wider, deeper and relatively easier methods for getting insights into the embryo’s genomic status.

Further work is going on to develop better approaches to make the sampling easier and incorporate computational and mathematical tools to improve the genomic diagnosis at the embryo level.

25. Morphometric study of Head and Neck of dried Adult Femora in Bihar and its clinical importance.

Dr. Kumari Soni

Background: Femur is the longest and strongest bone of the body. It articulates with the Hip bone above and with Tibia below and Patella lies in front of its lower end. Upper end of femur is clinically very important as it is one of the commonest site of Injury and Surgery. The knowledge of different measurement of head and neck of femur are important in diagnosis, treatment and follow-up of fracture of neck of femur and trochanteric fracture of neurovascular disorder of lower extremity.

Aims and Objective: To measure the Morphometric parameters of upper end of femur, which include femoral head diameter, femoral neck diameter and femoral neck length compare them with otherworkers.

Material and Method: A detailed study was carried out on 100 femurs of unknown sex and age in department of anatomy, Patna Medical College, Patna. All femors selected were dry and complete. All measurements were taken with the help of Vernier Calliper and recorded in millimeter (mm).

Result: Femoral head diameter range from 38-48mm. Femoral neck diameter ranges from 26-34 mm. Femoral
Discussion: After taking measurement of the upper end of femurs, the mean of each parameter were compared with mean obtained by other workers.

Conclusion: Knowledge of different parameters of head and neck of femurs will help designing Prosthesis of appropriate head and neck size thus reducing the failure rate of Hemiarthroplasty

26. Measurement of Bowing of Radius in Dry Bone in Population of Western Rajasthan

Ashish kumar1, Leena Raichandani2, Sushma kataria3, Tuhin Gulhani4, Hemkanwer zoya5.

Department of Anatomy, Dr. S.N. Medical College, Jodhpur

Background: Radius is a bone of forearm with complex angle and curve. The lateral curve is also called the Radial bow. The Radial bow plays an important role in supination and pronation of the forearm.

Aim and objective: The present study was conducted to observe the measurement of bowing of Radius in dry bone in Population of western Rajasthan.

Methods: The present study was conducted in Department of Anatomy Dr. S.N. Medical College, Jodhpur, Rajasthan. For this study, we used 50 dry bones. The Radius is placed on horizontal surface with the pronated position. Normal scale is placed as a line between distal points to Radial tuberosity. We take the length of entire bone and maximum Radial bow and distance to site of maximum bow from Radial tuberosity.

Results: Our study was done on 50 dry bones to determine the normal values of Radial bow. We found that the length of entire bow is 193.2 mm (SD 12.6 mm). The mean of magnitude of bow is 6.25% (SD 1.40%) length of entire bow. The mean value of site of maximum bow is 60.53% (SD 5.00%) of length of entire bow.

Conclusion: Maximum Radial bow is 10% of length of entire bow of Radius. Knowledge of dry bone measurements would be of importance to clinicians during surgical correction and plating of Radial fractures.

27. A descriptive study of morphometric data of femoral condyles by direct method to determine difference on right & left side at S.M.S. Medical College, Jaipur.

Dr. Jitendra Singh1, Dr. Sangita Chauhan2, Dr. Dhiraj Saxena3, Dr. Nandlal4.

Background: There are no published studies on the anthropometry of the distal femur in the Indian population. Hence the results obtained would provide valuable data on the average dimensions of the distal femur serving as guidelines for designing a suitable femoral component of total knee prostheses for this population.

Aim: To obtain morphometric data of femoral condyles to determine difference on right & left side.

Objective: To generate anthropometric data related to femoral condyles.

Results: In the present study the mean AP diameter of the medial condyle and lateral condyle on right side was 54.55±6.88 mm and 58.15±3.27 mm respectively; on left side was 54.36±3.56 mm and 57.79±3.17 mm respectively. The mean Transverse diameter of the medial condyle and lateral condyle on right side was 27.33±3.09 mm and 28.53±2.92 mm respectively; on left side was 25.03±1.99 mm and 28.63±3.23 mm respectively. For medial condyle in Transverse diameter parameters statistically significant difference found between right and left side because p value was <.05. In AP diameter parameters for medial condyle and in both AP and Transverse diameter parameters for lateral condyle no statistically significant difference found between right and left side because p value was >.05.

Methods: After applying inclusion and exclusion criteria 41 dried femur of each side (total 82) of unknown
age and sex will be selected for present study. The maximum AP & transverse distance of medial and lateral femoral condyles was measured.

**Conclusion:** On comparison between right and left side measurements, no significant difference was found between values of parameters of right and left sided femur.

28. **Morphological and Morphometric study of Glenoid Cavity in western Rajasthan population**

*Manu Shekhawat¹, Sushma K Kataria², Leena Raichandani³*

Dr. S.N Medical College Jodhpur

**Background:** Glenoid cavity is a shallow, concave and oval fossa at superiolateral border of scapula and form glenohumeral joint with scapula. Understanding morphometric and morphological variation of glenoid cavity play an important role for surgeon in conducting orthopedic surgery.

**Aims and objective:** To observe shape and various diameter of glenoid fossa in adult dry human scapulae.

**Methods:** 120 dry scapulae were observed in Department of Anatomy, for its shape and size using Vernier calliper.

**Results:** The above study concluded that most common shape of glenoid cavity was pear shaped (45.83%), 2nd most common shape is oval shape (35%) and inverted comma shape is the least common shape (19.16%) in glenoid cavity of scapula.

The measurement of Glenoid cavity in scapula were:

- **Right:** SI-D=34.53mm±3.46, AP1=22.3mm±2.9, AP2=16.13mm±2.48, GCI=64.57mm±6.91
- **Left:** SI-D=35.31mm±3.10, AP1=24mm±2.27, AP2=18.03mm±2.6, GCI=68.33mm±6.29

**Conclusions:** The above study helps Orthopaedicians and clinicians in shoulder dislocation, fractures and other shoulder associated injuries.

29. **Maximum cranial length: important parameter in sexing of crania**

*Dr Ruta Bapat*, Associate Professor, Department of Anatomy, Dr D Y Patil Medical College, Nerul, Navi Mumbai

**Background:** Determination of sex is one of the first and important factor in identifying decomposed bodies and skeletal remains. The correct sex determination is critical requirement in physical anthropology and medico-legal cases.

**Material and methods:** The maximum cranial length 1 and maximum cranial length 2 was taken in 300 crania of known sex in India.

**Result:** The statistical sex difference is found in mean values of cranial length 1 and maximum cranial length 2 in male and female crania (P < 0.001).

**Conclusion:** Maximum cranial length 1 is more effective parameter in sexing of crania.

30. **The study of heterotrophic ossification of hip bones and pelves muscles and ligaments**

*Sumita Agarwal*

**Background:** Heterotrophic ossification is an abnormal growth of bone in soft tissues.

**Objectives:** The present study is aimed to observe the ossifications of Transverse acetabular ligaments, Obturator membrane, gluteus maximus muscle and fibrous capsule in hip bones and ossifications in pelves of
sacrotuberos, sacrospinous ligaments, Erector spinae aponeurosis muscles and bilateral ankylosis of sacroiliac joint.

Methods: The study was performed on 128(66 of right & 62 of left) dried human hip bones and 6 pelves of unknown sex and age, in the Dept. of Anatomy, at Peoples college of Medical Sciences and research, Bhopal & at Government Doon Medical College, Dehradun, India. The hip bones and pelves were observed for ossifications and measurements of ossified ligaments were recorded using Vernier calipers.

Results: The present study the showed the incidence of completely ossified Transverse Acetabular ligament in 4 hip bones i.e., 3.12% with completely ossified fibrous capsule of hip joint on left side. The incidence of bony spurs along the margin of Obturator Foramen in 4 left hip bones is 6.25% along with the ossification of the gluteus maximus muscle on dorsal aspect of ilium. Out of 6 pelves, 1 pelvis presented complete ossification of Erector spinae aponeurosis bilaterally on the dorsal surface of the sacrum along with complete ossification of sacrotuberous ligament of right side and sacrospinous ligament of left side along with bilateral ankylosed sacroiliac joint of pelvis.

Conclusions: The knowledge of these abnormal ossifications of hip bones and pelves may be of immense help to Orthopaedicians, Surgeons, Neurosurgeons and radiologists to come to differential diagnosis and plan treatment accordingly.

31. A Study On The Effect Of Body Mass Index On Work Body posture Of Clinicians

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Background: Clinicians in the present scenario are always exposed to constant and sustained levels of physical exertion. As they form backbone of healthcare setup, the health of clinicians themselves is a very significant factor towards providing good health to all.

Aims & objectives: The objective of the study was to determine the effect of Body Mass Index on both static as well as dynamic body posture in clinicians. This will establish a relation between obesity and postural stress of clinicians.

Methods: The study was conducted in OPD clinics of various departments at Punjab Institute of Medical Sciences, Jalandhar and various private hospitals and clinics of Jalandhar. BMI was calculated as ratio of Weight (kg) to the square of height (m). Standing posture was assessed with the help of plumb bob passing the line in lateral and posterior aspect of the body finding the correct (YES) or faulty (NO) posture taken for the calculation. Dynamic (work sitting) posture was checked with observation during the OPD work (two to six working hours of the day) by using the RULA (Rapid Upper Limb Assessment) employee assessment worksheet.

Results: In high BMI group, majority (83%) of the clinicians were found to have faulty static posture and 76% had faulty dynamic work posture whereas normal BMI group had minimum faulty posture. Male clinicians showed more level of faulty posture than female clinicians. The results also show that with increase in age, BMI and faulty posture also take a higher turn.

Conclusion: BMI is positively related to physical well being of clinicians, especially in the middle and higher age group. This information serves as an awareness and warning signal for the clinicians to safeguard their own health and correct their faulty posture.
32. Variation of carrying angle with age, sex, height and special reference to side.

Mr. Ram Prakash Saini¹, Dr. Chandrakala Agarwal², Dr. Dhiraj Saxena³

Background: The carrying angle is defined as the acute angle made by the median axis of arm and median axis of forearm in full extension and supination. This angle permits the forearms to clear the hips in swinging movements during walking and is important when carrying objects.

Objective: The purpose of this study was to determine the values of carrying angle in both the sexes according to the age group in relation with height and special reference to side.

Methods: To evaluate the elbow carrying angle in normal children between 15-25 years by a manual goniometer, measurements were performed in 100 children (Male- 50, Female- 50), with the elbow in full extension and forearm in supination. Carrying angle was measured on right and left upper limbs to find out the difference on both the limbs.

Results: In females there was a significant positive correlation of age with carrying angle of both sides, height was negatively correlated, no correlation between length of forearm. In male age and height were not correlation with carrying angle, but length of forearm negatively correlated with both sides carrying angle. Greater carrying angle found in females.

Conclusion: The present study showed that the carrying angle was greater in female than in male.

33. Femoral Neck Anteversion angle (FNA) in femur bones

Dr. Arvind Deswal, Dr. Anju Bala, Demonstrator, Pt. B D Sharma PGIMS, Rohtak, Haryana

Background: The human bones play an important role for identification of sex in anthropological and medicolegal cases. A morphological method such as the visual inspection of bone morphology is completely based on the ability and experience of an observer for identification of sex.

Aim and Objectives: This observational descriptive study was carried out on femoral neck anteversion angle of fully ossified adult human femur bones.

Materials and Methods: The present study was performed on 112 fully ossified human femur bone (59 right and 53 left) of unknown sexes, collected from the Department of Anatomy. The angle of anteversion was measured by Kingsley Olmsted method which is formed by the femoral condyles plane (bicondylar plane) and a plane passing through the centre of the neck and femoral head. If the axis of the neck inclines forward to transcondylar plane the angle of torsion is called anteversion.

Results: The mean value of femoral-anteversion angle (FNA) was 19.58°±7.15° in total femora. In right femora was 20.09°±6.88° and in left femora was 18.71°±7.23° and the mean values of FNA were found to be higher in right femurs than left femurs. Statistically significant difference was found in total femurs.

Conclusion: The knowledge of morphometry of femur will be useful in anthropological and medico-legal practice, as well as to orthopaedicians for diagnosis and treatment of disease related to hip and femur.

34. The Metopic Suture-Facts and Faiths.

K. Uma, V. Lokanayaki, Y. Jalaja, Department of Anatomy, Government Kilpauk Medical College, Chennai.

Background: The cranial shaping and growth is an engrossing fact when we study about the cranial sutures and its evolution. Metopic suture, a dentate type of suture which gets ossified from two primary centers in frontal bone. According to Gray, the metopic suture usually closes by first postnatal year, may persists in small
percentage of adult skulls of about 1-12%. The persistence of metopic suture is called Metopism, which usually extends from Nasion to Bregma.

**Aim:** To study the persistence of Metopic suture in 30 adult dry skulls.

**Methods:** 30 adult dry skulls with persistent metopic suture were examined in detail from Department of Anatomy, Government Kilpauk Medical College, Chennai.

**Results:** Out of 30 adult dry skulls examined, metopic suture was found in 07 (23%) skulls. Out of 07 skulls with metopic suture, 02 were complete, 05 were incomplete. In incomplete metopic suture, 02-Linear, 01-H shaped, 01-U shaped and 01-V shaped.

**Conclusion:** Persistent metopic suture is clinically very important. Though not pathological, the metopic suture may be an incidental finding in X-ray skull. This should be considered as one of the differential diagnosis in ruling out Skull fractures especially Frontal bones. Premature closure of Metopic suture is also of greater importance as it associated with underdevelopment of Brain and frontal sinus hypoplasia.

Metopic suture, Dentate suture, Frontal bone.

FACT: Persistent Metopic suture is an incidental finding.

FAITH: Its Metopism-not frontal bone fracture.

35. **Is Arm-Span an Accurate Measure of Stature?**

**Pinki Rai, Ashima Das**

SHKM Govt. Medical College, Nalhar, Haryana,

**Background:** The estimation of inter-relationship between various body parameters and stature has been an important tool in anthropometric measurements. It is found to be of great importance in such cases where direct measurement of stature is not possible.

**Objective:** To find correlation of arm span and stature and the accuracy of arm-span in predicting standing height of both males and females in studied population.

**Materials and Methods:** The study involved 600 participants (300 males and 300 females). The data for study collected from Rajasthan by means of community visits. The standing height and arm-span were measured for each individual and analyzed. Correlation coefficient and regression equation was generated.

**Result:** A positive correlation was found to exist between the arm-span and stature. The correlation coefficient r was found to be 0.9. In the studied population, the arm span was found to be a strong predictor of Stature.

**Conclusion:** It can be concluded that arm-span can be used in estimation of the height of both males and females. Arm span is reliable tool for obtaining the approximate stature of an individual. It can be used for the purpose of medico-legal cases too.

36. **Morphometric Study of Greater Sciatic Notch of Dry Human Hip Bone.**

**Sagun Shukla**, Presentater & Ph.D Research Scholar, Malwanchal University, Indore.

**Background:** The identification of sex from skeletal remains of great medico-legal and anthropological importance. Hip bone in this aspect plays very important role, specially its greater sciatic notch which can be recognized early during fetal development.

**Aims and objective:** To study the depth, breadth and index of greater sciatic notch.

**Material and Methods:** we studied, 40 dry, adult human hip bones of both sex. Only fully ossified bones
with clean and intact posterior border were included. Greater sciatic notch is measured with help of digital vernier caliper.

**Results:** The mean value of breadth, depth, and sciatic notch index in males were 4.14(SD 0.60), 3.49(SD0.37), 75.20(SD15.48), while in females were 4.56(SD0.56), 2.93(SD0.67), 66.71(SD16.69), respectively.

**Conclusion:** depth of sciatic notch was significantly higher in male while breadth was significantly higher in females. There was no significantly difference between index of greater sciatic notch of both sex.

37. **Establishment of sexual dimorphism of permanent maxillary canine teeth in rajasthan population by orthopantomographic study**

**Dr Suresh Sharma**

**Background:** Teeth and their measurements give the impression to be the most reliable method since teeth prove the most durable and resilient part of the skeleton. Especially Canines are the most durable teeth in the oral cavity due to the labio-lingual thickness of the crown and the root anchorage in the alveolar process of the jaws.

**Aims and Objectives:** To determine of sexual dimorphism of permanent maxillary canine teeth in rajasthan population

**Methods:** 300 patients of 150 male and 150 females was included in the study. Use Measurement like mesiodistal width and intercanine distance in maxillary jaws were established based on radiographic examination with the help of digital Orthopantomograph.

**Results:** Canine mesiodistal width was higher in male (left: 7.80 ± 0.04 and right: 7.80 ± 0.04) then female (left: 7.54 ± 0.15 and right: 7.53 ± 0.12) p-value = <0.001. Maxillary intercanine distance was 36.45 ± 0.81 for male & 34.76 ± 1.55 for female. On the other hand, maxillary right and left canine index was higher in female than male P-value <0.001.

**Conclusions:** Maxillary intercanine distance shows maximum sexual dimorphism among all measurements and canine index shows negative sexual dimorphism.

38. **The Morphometrical Variation of adult’s Human Face in Nepal**

**Yadav SK¹, Srivastva AK², Kumar Alok³, Singh AR⁴**

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**Background:** The evaluation and measurement of human body dimensions are achieved by physical anthropometry. Cephalometery is a branch of anthropometry science in which the head and face anatomical dimensions are measured. This research was conducted in view of the importance of anthropometric indices of the face in forensic medicine, surgery, paediatrics and medicalimaging.

**Objective:** To compare anthropometric dimension related to Face length, Face width and Prosopic index among Nepalese adults.

**Material and Methods:** This cross-sectional study was set up to determine and compare the face shapes Nepalese populations aged between 17 & 30-year-old males and females. The length and width of faces were
determined by using Digital vernier calliper and martin spreading calliper respectively. The shape of faces in among males and females of Nepalese population were determined and was compared with other studied and population.

**Results:** In this research, we found that mean values face height and width among males and females were 115.64±7.06 and 112.78±4.6 and were 128.96 and 126.07 respectively. Prosopic Index among male and females were 89.67 and 89.45 respectively. The result showed that both males and females was found to round face. This showed that Nepali population face was Mesoprosopic (round) PI = 85 <PI<89.9.

**Conclusion:** This study determined the possible effect of ethnicity on the diversity of face shapes in males and females adult Nepalese.

39. **Morphometric Analysis of foramen Spinosum in Western Rajasthan Skulls**

Bhavesh Kumar, Sushma K Kataria, Leena Raichandani, Department of Anatomy, Dr. S.N Medical College, Jodhpur

**Background:** The foramen spinosum is one of two foramina located in the base of the human skull, on the sphenoid bone. This foramen gives passage to the middle meningeal artery, middle meningeal vein and the meningeal branch of the mandibular nerve.

**Aims and objectives:** To find out the variations in the shape and size of foramen spinosum.

**Methods:** 60 dry human skulls were taken from Department of Anatomy, Dr. S.N Medical College Jodhpur Rajasthan, variation in shape were observed and various diameters were calculated using vernier caliper.

**Results:** The foramen spinosum found as round in shape bilaterally in 55%, unilaterally in 25% of skull base, Whereas, oval in shape bilaterally in 20%, unilaterally in 25% of skull base and irregular in shape were not observed. Mean diameter in round shape of foramen spinosum is 1.124±0.193mm, Mean transverse diameter in oval shape of foramen spinosum is 0.551±0.444mm and mean anteroposterior diameter in ovale shape of foramen spinosum is 1.032±0.814.

**Conclusions:** Knowledge of foramen spinosum diameters and shape play important role in diagnostic medicine and neurosurgery.

40. **Study of lumbar Vertebra in relation to pedical and its clinical significance.**

Pooja Bhadoria, Assistant Prf., Department of Anatomy, AIIMS, Rishikesh, India.

A morphometric study of the lumbar vertebrae giving emphasis on the pedicular parameters was conducted on 30 sets of dried vertebrae. The study of pedicle dimensions is important in order to determine the size of pedicle screws to be used in surgeries aiming to stabilize the vertebrae.

**Methods:** 30 sets of dried bones were used and the listed measurements were taken- pedicle height, mid-pedicle width, pedicle length, transverse pedicle angle and interpedicular distance. The transverse pedicle angle was measured with a goniometer while all other measurements were made using a digital vernier caliper.

**Observations:** In the current study, the mid-pedicle width ranges from 7.49 mm to 13.25 mm, the pedicle height from 14.87 mm to 13.56 mm and pedicle length from 16.36 mm to 17.24 mm. The transverse pedicle angle varies from 13.32° to 17.42° and the interpedicular distance, from 20.46 mm to 23.4 mm.

**Conclusion:** The pedicle width increases from L1 to L5 while the pedicle height decreases from L1 to L5. The choice of pedicle screws depends on the mid-pedicle width.
41. Anatomical variation in the position of the greater palatine foramen

Rachana Gehlot, Dr. Sushma K. Kataria, Leena Raichandani.
Department of Anatomy, Dr. S.N. Medical College, Jodhpur

Background: The present study was aimed to find out the position of the greater palatine foramen relative to adjacent anatomical landmarks in western Rajasthan population.

Aims and Objectives: To find out position of greater palatine foramen in relation to incisive foramen and midline maxillary suture.

Material and method: 57 dried human skulls were observed and distance between incisive foramen and greater palatine foramen and midline maxillary suture, greater palatine foramen were calculated using vernier caliper.

Result: In majority of the skulls (53.44%) the GPF were opposite to junction between right and left second and third molars, and 27 (46.55%) foramina were opposite to third molar. No foramina were found opposite the maxillary second molar. The mean distance from the incisive foramen to the greater palatine foramen on the right inside was 31.73 ± 4.04 mm (mean ± SD), and 32.26 ± 4.51 mm (mean ± SD) on the left side. The mean distance from the midline maxillary suture to the greater palatine foramen was 9.89 ± 2.60 mm (mean ± SD).

Conclusion: The greater palatine foramen mostly had an oval shape and one each greater palatine foramen changing in size was observed bilaterally in all the crania. We hope that the data we obtained will provide also an index for future anthropological studies.

42. Determining new anthropometric markers for screening Type 2 DM in the Caribbean region.

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Background: The prevalence of Diabetes Mellitus (DM) in the Caribbean is high. BMI has been criticized as a measure for predicting type 2 DM development because it does not discern between fat mass and muscle mass, nor does it reflect an individual’s fat distribution.

OBJECTIVES: To determine the association between Indices using Height, Waist, Hip, Thigh, Arm, and Wrist circumference (cm) with development of Type 2 DM by comparing it to existing markers in test subjects and assessing their feasibility as predictive indicators for the development of Type 2 DM.

Methods: In a cross sectional study, total of 348 subjects were involved in the study utilizing health centers and health camps in St Kitts (West Indies). Height was measured using Stadiometer, Weight using a calibrated digital weighing scale. Waist, hip, thigh, arm, and wrist circumference (cm) was measured using calibrated tape. ABI (Arav Body Index) is measured using a ratio of Wrist + Waist and Thigh + Height and will be compared to WHtR and BMI.

Results & Conclusion: ABI subjected to AROC curves showed greater values (0.801) as compared to WHtR (0.705) and BMI (0.578). The cutoff values for ABI was 0.46. Among subjects with ABI less than 0.46, 92.1% did not have type 2 DM and with ABI more than 0.56, 70% had type 2 DM. We conclude that ABI could be a more reliable tool for identifying individuals at risk of developing type 2 DM. This will help at-risk individuals to take preventive measures like lifestyle modification.
43. Morphometric analysis of Suprascapular Foramen in Telangana Population

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Background: suprascapular nerve a branch of upper trunk of brachial plexus passes through the suprascapular notch, which is seen along the superior border of scapula and passes below the superior transverse scapular ligament. Their is a possibility that the nerve may be compressed by the ligament especially if it is ossified. Suprascapular nerve compression may lead to suprascapular nerve entrapment neuropathy.

Aims and Objectives: To study the morphometry of suprascapular foramen and incidence of absent, partial, and complete ossification of the superior transverse scapular ligament in the Telangana population.

Methods: Two hundred dried human scapulae were examined in detail. Scapulae with suprascapular foramen having varying degrees of ossification were noted. The measurements of foramen and thickness of the ossified superior transverse scapular bar were taken with the help of vernier caliper and recorded in millimetres. The data were analyzed statistically.

Results: In this study out of 200 scapulae, 172(86%) showed the presence of the suprascapular notch, 28(14%) showed superior transverse scapular bar out of which 9(4.5%) showed partial ossification and 19(9.5%) showed complete ossification. The measurements of suprascapular foramen mean vertical diameter is 6.27mm and the mean transverse diameter is 4.88mm.

Conclusions: The Anatomical knowledge of the Ossified superior transverse scapular ligament is of the great predisposing factor for diagnosis of suprascapular nerve entrapment, which is for use for clinicians and surgeons in the proper treatment plan of entrapment neuropathy.

44. Anthropometric measurement of upper end of tibia in north Indian population and its clinical significance: dry bone study.

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Background: As there is increase in obese population and world population is rapidly increasing toward old age group. So chance of osteoarthritis also increase with need of total and partial knee replacement. So making for the design of total and partial knee replacement prosthesis. Accurate morphological measurement of proximal end of tibia are very important. The data today available for implant sizing are mostly of Caucasians, which have higher values when compared to Indians. So, study of proximal tibial anatomy for Indian population is a primarily required with increasing use of total knee arthroplasty as treatment of choice in degenerative knee joint diseases.

Aims and Objectives: To determine the Anthropometric measurement of upper end of tibia (dry bone study).

Methods: A total of 400 dry human tibia bones were analyzed for this study. The bones were obtained from the Department of Anatomy, King George’s Medical University U.P., Lucknow. The measurements of anteroposterior and transverse diameter of medial condyle (AP-MC & T-MC), lateral condyle (AP-LC & T-LC), Intercondylar area (AP-IC & T-IC) and Bicondylar width (BCW) were taken by sliding Vernier caliper.

Results: Anteroposterior and transverse diameter of both condyle are greater in the right tibia when compared with the left tibia. Anteroposterior diameter of medial condyle is greater than lateral condyle but transverse diameter is greater in lateral condyle for both right and left tibia.

Conclusion: The present study will enhance the anatomical information for upper end of tibia in north Indian
population (the exact dimensions and area covered by medial and lateral condyles) and provide the primary information for implant design for unicompartmental knee arthroplasty and complete knee arthroplasty and greater outcome after surgery specific for north Indian population.

45. A Morphometric study of patella in Lucknow region

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Background: Patella is the largest sesamoid bone which develops in the tendon of Quadriceps femoris muscle and protects the front of knee joint. It has gained anatomical, clinical & forensic significance due to its vital role in patellofemoral mechanics and its property of resistance to post mortem changes.

Aims and Objectives: Our study aims to measure the various dimensions of left and right human patella which can be useful for the manufacture of patellar prosthesis, better suited to Indian population, in contrast to already available prosthesis which are mostly based on the Western anthropometric measurements.

Methods: The study involves 100 dry human patella, 50 each from left and right sides. Total patellar height, maximum height of articular surface, maximum width, maximum thickness, shape, width of medial and lateral articular facets of patella were measured using digital Vernier calipers. Mean and standard deviation were calculated for each parameter for left and right sides and the data was analyzed using SPSS.

Results: The mean of patellar width on left side came out to be 41.65 mm and SD was 2.78, while for right side, the mean of patellar width was observed to be 42.83 mm and SD was 3.02. Therefore, a statistically significant difference was observed (p= 0.044) in patellar width of left and right sides.

Conclusion: Anthropometric study of patella in India can thus be helpful in designing femoropatellar prosthesis for our population leading to better post-operative outcome.

46. Study of Lip print by photographic method in population of Uttar Pradesh

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On frontal view, the face can be divided into vertical fifths and horizontal thirds. The perioral region can be defined as the lower one third of the face extending laterally to encompass the middle three fifths of the face. It is bounded by the subnasale and cheek–lip groves superiorly and the mentum inferiorly. The lower one third of the face can be further divided into thirds with the upper one third, including the upper lip, and the lower two thirds, including the lower lip and chin.

The development of Lip appear on 6th week of Intra Uterine Life (IUL) which develops from lateral part of the upper lip, most of the maxilla. The furrous on the red part of the human lips was described by Fischer. There is a depression on upper lip, the philtrum which derived from the word ‘Love Potion’ is peculiar feature of the upper lip, provides the facial beauty. Cheiloscopy (from the Greek words cheilos - lips and skopein - see) is a forensic research technique that deals with the study of lip prints, their elevations and depressions that form a distinctive pattern on the outer surface of the lips. On profile view, the upper lip should extend 2 to 3 mm beyond the lower lip.
Aim: The aim of this study was to study the Lip pattern and its upper margin (Cupid’s bow) by photographic method.

Materials and Methods: We included 100 subjects (50 males and 50 females both). A digital camera. The subjects asked to sit on table with 2 feet distance from the observer and their head lies on Frankfurt’s position with thereafter the photographs were recorded after prior consent and put in a separate file then we noted their lip patterns after counting, observed their cupid’s bow also.

Results: Descriptive statistics showing that in male, Type III (37%) and Type IV (44%) is coming out to be prominent considering all quadrants together while in female, Type I and Type Ia is more prominent with 45.5% and 25.5% respectively. The deep shallow type (43%) of Cupid’s bow is more prominent as compared to shallow (41%) followed by round (16%). The Chi-square test showed that there is statistically significant difference (p<0.05) were observed between male and female lip prints patterns in each of the quadrants.

Conclusion: Useful in the constructive lip surgeries, cosmetics purpose and forensic practices for personal identification and ethnic purpose also.

47. Variant anatomy of the iliac venous system: A study linked with laparoscopic hernia reduction and pelvic surgeries.

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Background: Haemorrhage, whether retroperitoneal or intraperitoneal, is one of the most unwanted complications in any laparoscopic hernia reduction surgery or pelvic surgery, thus making variant anatomy of iliac venous system important as intraoperative injury to these venous channels can be one of its major causes.

Aims: To study the existing communications between the external and internal iliac venous system and perform its morphometric analysis.

Material and Methods: 24 formalin fixed human hemi pelvises were dissected, internal (IIV) and external iliac veins (EIV) along with their tributaries were identified. Major venous anomalous communications were noted and measured accordingly.

Results: 33.33% of all the observed pelvic halves had major anomalous venous communications between EIV and IIV.

Conclusion: Knowledgeanatomy of the pelvic venous system is vital to a surgeon especially in laparoscopic surgeries and even in the post-operative outcome of the patient.

48. Anatomical considerations of full-face transplant

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Background: A full-face transplant is a fully functional aesthetic replacement of one’s totally damaged facial tissue using tissue from a donor. Literature review shows that reconstruction of the burnt face is a major challenge and results are having limited success due to the lengthy procedure.Extensive vascular anastomoses with in the facial tissues paved the way for alternative methods of graft harvesting strategies to minimize the operative ischemia.
Objective: It is to practice the donor graft harvesting strategies through mock cadaveric facial transplantations as well to explore the anatomic parameters to evolve alternative methods to shorten the harvesting time and optimal pedicle length.

Methods: Cadaveric dissections were done on Thiel embalmed cadavers using 2 types of harvesting techniques i- Superficial Temporal artery/Facial Artery-pedicle ii- External Carotid Artery - pedicle. Find out the technique that is having shortest time and best length of the pedicle.

Result: The best technique of harvesting the graft and the anatomical parameters are studied and practiced in the cadaver for the forth coming full face transplantation is practiced well on cadaver.

Conclusion: From the literature review and past experiences a comparatively better method of harvesting graft is practiced on cadaver, by avoiding interference with the complicated anatomy of the carotid and submental triangle.

49. Lip print analysis using image processing- A promising tool in personal identification

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Background: Every individual has their unique identification like palm print, signature, finger print, face recognition, lip print etc. Chelioscopy is a forensic investigation technique that deals with identification of humans based on lips traces. The wrinkle and grooves pattern on the lips has individual characteristics like tongue prints, face recognition, iris pattern, fingerprints for conclusion.

Aims and Objectives: Here in this research one such effort is made to analyse lip print and identify the individual using their lip print.

Methods: Lip print for this work is obtained by applying lipstick and taking the impression on the Paper. By using Image processing technique lip print of the individual is captured, processed and analysed.

Results: With image processing the identification of lip print is more specific and less cumbersome as compared to manual method.

Conclusions: This can be used in identifying person by forensic department. For more accuracy combination of figure, palm, iris and lip print can be used for individual identification.

50. Identifying the Best Site for Bone Graft harvesting from Anterior Iliac Crest

Dr Simriti, Dr Bias Dev; Department of Anatomy Govt Medical College Jammu

Introduction: Bone graft harvesting is a very common procedure undertaken by reconstructive and orthopedic surgeons. Though it is a very commonly performed procedure, yet there is no uniformity in the site selection and technique, and often bone graft harvest is not up to the surgeon's satisfaction. We probed the common site being used by orthopedic surgeons for the harvest of bone graft from anterior iliac crest of Iliac bone, by creating a questionnaire and asked them to identify the ideal location on the anterior iliac crest.

Materials & Methods: The dimension of iliac crest at 5 mm increments was measured from anterior to posterior and the thickest portion of the anterior iliac crest which can be used for bone graft was identified.

Results: We have found that the thicker bone to be utilized from Iliac crest is anteroinferior portion of anterior iliac crest.

Conclusion: The bone graft harvesting procedure does not always yield satisfactory volume of bone graft and we have found that the thicker bone to be utilized from Iliac crest is anteroinferior portion of anterior iliac crest and this information will be of use for orthopaedic and reconstructive procedures.
51. Correlation of dermatoglyphics patterns in diabetic with hypertensive patients

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Demonstrator, Pt. B D Sharma PGIMS, Rohtak, Haryana

Background: Dermatoglyphics is the study of skin markings produced by the ridges on hands and feet. Dermatoglyphics is used as a way of measuring gene expression determined by the early prenatal environment. Fingerprints studied by dermatoglyphics are unique for a given individual. It depends on the genetic makeup of an individual. Diabetes associated with hypertension, a harbinger of many complications, is determined by genetic and environmental factors.

Aim and Objective: The present observational study tried to find an association of dermatoglyphic patterns in diabetic with hypertensive (DM+HTN) patients.

Materials and Methods: The present study was carried out in the Department of Anatomy. Dermatoglyphics patterns were collected from 153 patients with DM and HTN (83 males and 70 females). Equal number of healthy, age and sex matched individuals were included as control. Demographic details and history was recorded on a proforma.

Results: In patients with DM with HTN, the most predominant pattern was ulnar loop (52.28%) followed by whorl (41.76%), arch (4.24%) and radial loop (1.69%) and in control, the most predominant pattern was ulnar loop (50.08%), followed by whorl (44.46%), arch (3.17%). In both hands of male and female patients, ulnar loop was most predominant pattern followed by whorl, arch and radial loop patterns in comparison to control.

Conclusion: Fingerprint patterns can be reliably used to identify individuals likely at risk for diabetes and hypertension and accordingly, preventive measures can be targeted.

52. Ossified ligaments of pelvis and its clinical implication

Jolly Agarwal, Government Doon Medical College, Dehradun

Background: The sacroiliac joint is synovial articulation between sacral and iliac articular surfaces. Fibrous adhesion and gradual obliteration occur in between both auricular surfaces of pelvis in both sexes. The articular capsule is attached close to both articular margins. The ligaments of sacroiliac joints are ventral, dorsal and interosseus sacroiliac ligaments.

Aims and objectives: To observe incidence of ossification of various ligaments of pelvis.

Material and methods: This study was performed on 60 dried pelvis of the Department of Anatomy, SRMS IMS, Bareilly and GDMC, Dehradun. In all pelvis, sacroiliac ligaments, sacrotuberous, sacrospinous and transverse acetabular ligaments of pelvis were observed for ossification.

Results: In this study, bilateral ossification of ventral, dorsal and interosseus sacroiliac ligaments were observed. The incidence of ossification of ligaments of sacroiliac joints are overall is very rare. The incidence of bilateral ossification is same as unilateral ossification. Incidence of ossification of sacroiliac ligaments are more as compare to sacrotuberous and sacrospinous ligaments.

Conclusions: Ossification of pelvic ligaments may result in neurovascular compression syndrome, soft tissue pain and operative hazards, therefore it is important for radiologist and orthopaedic surgeon.
53. **Hormone markers of pituitary adenomas: an immunohistochemical study**

**Abhilasha Maharshi, Amrit, Simmi Mehra, R.P Busar, Surbhi Tyagi.**

**Background:** The incidence of pituitary adenomas constitutes approximately 10-25% of all intracranial neoplasm. The classification of pituitary adenomas has changed considerably over time. The first attempts at classification relied on hematoxylin and eosin staining of resected tissue. 2004 WHO guidelines were more dependent on ultrastructural studies of the secretory granules of the tumor. The current 2017 WHO Classification of Pituitary adenomas is defined by hormonal immunohistochemistry of hormones of anterior pituitary and their pituitary specific transcription factors. Modern histologic evaluation utilizes immunohistochemical staining techniques to identify the hormones within adenoma cells.

**Aims and Objectives:** To study the hormonal subtyping of pituitary adenomas and identifying monohormonal & plurihormonal tumours & biochemically silent adenomas.

**Methods:** An observational study was carried out on 40 surgically resected pituitary adenomas. They were studied immunohistochemically with polyclonal antisera to 7 anterior pituitary hormones.

**Results:** 25.0% of the case subjects were interpreted as Somatotroph. 25.0% of the case subjects were interpreted as Gonadotroph. 22.5% of the case subjects were interpreted as Corticotroph, 12.5% of the case subjects were interpreted as Lactotroph, 10.0% of the case subjects were interpreted as Plurihormonal, 5.0% of the case subjects were interpreted as Mammosomatotroph.

**Conclusion:** An integrated evaluation of tumor biopsy by light microscopy and immunohistochemistry is needed to diagnose and classify pituitary adenomas as per latest 2017 WHO classification. It is necessary to know the hormonal profile as certain types of pituitary adenoma are designed as aggressive adenomas in respect to their gender, size and hormonal activity.

54. **Comparison of frequency of micronucleus in individuals with history of tobacco and without history of tobacco**

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PG Resident, Lady Hardinge Medical College, Delhi.

**Background:** Tobacco consumption continues to prevail as most important risk factor for oral carcinoma. Micronucleus is a marker for genetic damage in oral precancerous lesions. Hence the present study has tried to assess the micronucleus frequency in tobacco chewers as compared with non-tobacco chewers.

**Aims and Objectives:** To compare the micronuclei frequencies in individuals with history of tobacco and without history of tobacco.

**Methods:** The study was conducted in department of dental and oral surgery and department of anatomy Lady Hardinge Medical College and associated Hospitals. A total of 80 participants were taken then micronucleus frequency was compared in those with history of tobacco to those without history of tobacco. The data was tabulated and analyzed statistically.

**Results:** In this study out of 80 cases taken individuals with history of tobacco had significantly higher Micronucleus frequency as compared to non-tobacco chewer with p value < 0.05.

**Conclusion:** The Micronucleus frequency can be used as a indicator of genetic damage caused by tobacco,
55. Histological analysis of coronary atherosclerosis at myocardial bridges: A Cadaveric study

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Background: Coronary artery disease due to atherosclerosis is an epidemic in India which is the leading cause of mortality worldwide and is responsible for one-third of all deaths.

Aims and objectives: The present study was undertaken to observe the myocardial bridges over the different branches of the coronary arteries and atherosclerosis related to bridges in hearts without history of cardiac disease.

Materials and Methods: This study was done in the Department of Anatomy and Forensic Medicine, KGMU Lucknow UP, India in 50 adult human hearts which had no history of cardiac disease. The hearts were then dissected and examined for number and position of myocardial bridges (MB). The multiple tissue sections were taken at 3mm interval from the coronary arteries proximal, below and distal to the MB. These tissues were undergone in whole histological slide preparation technique and finally observed under microscope to note atherosclerosis.

Results: In present study out of 50 cases 26 (52%) had MB. Total 78 segments were evaluated which include proximal, below and distal to the myocardial bridge. Majority of atherosclerosis was present proximal to bridges (77%) which is statically significant.

Conclusion: The proportion and Grade of atherosclerosis are significantly higher at proximal end of myocardial bridges in hearts without history of cardiac disease. The identification of high-risk zones for atherosclerosis will lead to future advances to locally oriented preventive strategies.

56. Stereological estimation of effects of Sucralose on liver of albino rats

Dr Diwakar Dhurandhar, Dr Jagriti Agrawal, Dr Deepti Chandrakar

Pt. J.N.M Medical College, Raipur, Chhattisgarh

Background: Sucralose is an artificial sweetener which is used very commonly now a days by diabetics and fitness conscious groups. The literature available regarding the effects and safety of its use in humans is scarce. The 2-D histomorphometry of slides is now replaced by 3-D Stereology which is free from assumption bias, thus a more precise indicator of toxicological histopathology. M 42 test system was imposed in Stepanizer application to record the findings of outcome variables after ingestion of 3gm/kg/day of sucralose via oral gavage.

Aims and Objectives: The present research was conducted with the aim of estimating the effects of Sucralose on liver of albino rats with following outcome variables: Size of hepatocytes, Size of nuclei of hepatocytes, Width of sinusoids and Kupffer Cell numbers and Number of lymphocytes (if any). Any histopathological feature was also looked upon.

Results: No significant differences in size of hepatocytes, size of nuclei of hepatocytes was noted in sucralose treated rats as compared to controls. But sinusoidal width and number of lymphocytes per unit area was found to be significantly increased in experimental rats as compared to controls.

Conclusions: Stereological estimation of liver indicates the harmful effects of sucralose after sub-lethal dose of pure sucralose.

Dr. Manali Arora, Dr. Ghanshyam Gupta, Dr Sushma K. Kataria

Background: Chronic blood transfusion in patients with β-thalassemia major can lead to blood borne infections, autoimmunization, febrile reactions and most fatal iron overload. To assess iron overload the simplest method is Serum Ferritin which is an invasive procedure.

Aim and Objectives: To know whether oral exfoliative cytology using Perl’s Prussian blue stain, can be a tool for screening of iron overload in β-thalassemia major patients undergoing chronic blood transfusions and to correlate Perl’s Prussian blue staining with serum ferritin levels.

Methods: Smears were obtained from buccal mucosa of 200 randomly selected β-thalassemia major patients who were having regular blood transfusions and 200 healthy subjects as controls. Smears were stained with Perls’ Prussian blue stain and were examined under research microscope to see presence or absence of blue coloured granules.

Result: Oral exfoliative cytology method using Perl’s Prussian blue stain to detect iron overload in β-thalassemia major patients having repeated blood transfusion revealed 93% Sensitivity, 100% Specificity, 100% Positive Predictive Value, 93.46% Negative Predictive Value and 96.50% Accuracy.

Conclusion: Oral exfoliative cytology using Perl’s Prussian blue reaction which is non-invasive, cost effective and easy method with high sensitivity and specificity can be used as a diagnosis and screening tool for demonstration of iron overload in β-thalassemia patients receiving repeated blood transfusion.

58. Placental histochemical scenario in maternal hypothyroidism

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1. Santosh Medical College, Ghaziabad; 2.King George’s Medical University, Lucknow; 3.Vardhman Mahavir Medical College and Safdarjung Hospital, New Delhi; 4. Prasad Institute of Medical Sciences, Lucknow

Introduction: There is paucity of medical literature on histochemical changes in placenta in hypothyroidism. The present study attempts to evaluate the histochemical changes in placenta attributable to hypothyroidism as compared to euthyroid pregnancy.

Objective: To study histochemical changes in placenta of normal and hypothyroid pregnancy.

Material and Method: Fifty placentae from hypothyroid mothers (cases) and 20 from euthyroid mothers (controls) were collected after due ethical clearance from the institutional ethics committee and consent from the participants. The placental tissues were subjected to routine histological processing and stained using special stains to study the histochemical features. The slides of cases and control group were compared for degree of PAS and Sudan black staining to assess respectively the glycogen and lipid content in the stained tissues.”

Results: Both the groups were comparable for mean age of mother, gestational age and gravida status of mother at delivery. Mild to moderate increase in the degree of staining of placental tissue with PAS and Sudan black staining was observed in hypothyroidism but the results were statistically not significant.

Conclusion: The degree of staining of placental tissue with PAS and Sudan black was compared in cases and controls as a marker of glycogen and lipid content. Increased glycogen and lipid content as assessed by degree of staining with PAS and Sudan black stains respectively was observed in hypothyroid placentae but it the
difference between the cases and controls was insignificant. Thyroxine supplementation for variable duration during pregnancy might have led to equivocal results.

59. A histological study of adult human cadaveric tissue as an alternative to animal tissue

Purohit Sumati, Shushma K. Kataria, Leena Raichandani

Background: Human cadavers are available in the department so we can prepare the histological slides from those, which can replace the animal tissue slides. The knowledge of histology of normal tissue is an essential requirement of establishing parameters of diagnosis of pathological condition for that human tissue slides are prefer than animal tissue.

Aim: To compare histological parameters (tissue architecture, cell size, sharpness of the cellular outline, size and position of nucleus, connective tissue state and staining, absence of features of cell death) with animal tissue.

Method: Our study was cross sectional observational and it was conducted in the department of Anatomy Dr. S.N. Medical College Jodhpur, Rajasthan. Tissue slide are prepared according to routine H & E staining method. The photomicrographs were then showed to the department faculty, the images of the prepared slides marked A for animal tissue and B for human tissue for eliminating bias and asked to compare by way of a feedback form on the basis of histological parameters.

Results: The results calculated from all feedback formats taken from faculty of department of anatomy. The inference of feedback assessment revealed that human tissue slides are more relevant, satisfactory than animal tissue slide.

Conclusion: This study showed that cadaveric tissue is suitable for histological studies as it is ideal and unlimited source of tissue for research and teaching.

60. Effect of Variable Dose of Cisplatin on Microanatomy of Liver in albino rats

Dr Rabiya Amin, Dr Ubaid Ali

Background: Cisplatin also known as peyrone’s salt is an organic metal co-ordination complex which is widely used as a chemotherapeutic agent against a variety of malignant tumors. It interferes with the dna synthesis thus causes apoptosis in a way that the growth of normal cells is also affected. These effects alter the function of many tissues and organs.

Aims and objectives: To observe the macroscopic and microscopic changes in these tissues over a period of time.

Methods: 60 albino rats weighing on an average 100 grams were taken. The animals were divided into three groups. Group a (20) animals received no drug. Group b (20) was injected with 1.3mg/m² of cisplatin by intraperitoneal route and group c (20) received 2.5mg/m² of cisplatin. The process of drug administration was continued for 12 weeks. The animals were sacrificed in five sittings, after interval of 1, 3, 6, 9 and 12 weeks after drug administration. At the termination of experiments liver was fixed and stained with h&e.

Results: Liver showed sinusoidal dilatation, fatty changes, vacuolization of hepatocytes, sinusoidal congestion and central vein congestion. All these changes were pronounced in high dose group.
Conclusion: Indubitably cisplatin is a potent anticancer drug, however its significant antitumor action is limited by the development of toxicity. Which is evident in many animal species so its judicious monitoring is important.

61. Cadaveric study of circumvallate papillae and taste bud density across geriatric age group

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Vidya G D Reader, Department of oral Pathology and Microbiology JSS Dental College JSS AHER, Mysuru-15
Prathibha Periera, Professor and Head of Geriatric Medicine, JSS Medical College and Hospital, JSS AHER, Mysuru-15

Background: Circumvallate papillae are the largest papillae located on the surface of the tongue. They appear flattened and are oval shape with a trough separating them from the surrounding wall and are found at the back of the tongue in a V-shaped line across the root of the human tongue. Taste buds are peripheral structures responsible for sensing taste compounds in food and drink. Each taste bud contains a number of specialized epithelial cells, including taste receptor cells for recognizing sweet, bitter, umami, sour, and salty compounds. Some of the subjective variability attributed to taste experience could be related to wide variations of taste bud density.

Objectives: To investigate histomorphometry of taste buds in circumvallate papillae of geriatric age groups in Mysore based population

62. A comparative study of morphometry and histology of human umbilical cord in normal healthy pregnant females and pregnant females with pregnancy induced hypertension

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Background: Pregnancy Induced Hypertension is often associated with histopathological changes in relation to placenta which is often associated with poor fetal outcomes. The histopathological analysis of 2-D profiles is now replaced with 3-D stereological estimation which is more precise and free from assumption bias.

Aims & Objectives: To do a morphological, histological and stereological study on umbilical cords obtained from term pregnant females having pregnancy induced hypertension (PIH) and compare it with that of the normal term pregnant females.

Method: The study was done on 62 umbilical cords, 31 from normotensive mothers and 31 from PIH mothers. Serial sections of the umbilical cords were stained with hematoxylin and eosin (H&E). Systematic uniform random samples of umbilical cord sections were identified under microscope and unbiased stereological and histological study was performed using Stepanizer app M-42 test system superimposed.

Results: The mean length and diameter of the cord in PIH was reduced. Umbilical artery showed contracted lumen, thickening of wall, increased hydropic changes deposition of fibrinoid material in the tunica intima and media. Umbilical vein had dilated lumen, thinning of the wall, increased hydropic changes, increased intercellular space and disturbed architecture of smooth muscle cells and their nucleus.

Conclusions: PIH significantly effects the morphology and histology of umbilical cord in such away that it leads to hemodynamic compromise in the fetus and can lead to adverse outcomes like low birth weight.
63. Ameliorative effects of Ginkgobiloba on histomorphological changes and learning & memory impairments induced by Fluoride & Arsenic in Wistar rats.

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Department of Anatomy, Sri Devaraj Urs Medical College, Kolar, Karnataka.

Background: Fluoride (Fl) and arsenic (As) are often found in drinking water. Fl and As poisoning causes dental fluorosis, bone disease and pigmentation of skin. Fl & As impair learning and memory. Ginkgobiloba is an ancient Chinese medicinal plant. Extraction of Ginkgobiloba (EGB) contains glycosides which improves neural plasticity and prevents the cognitive deficits.

Aim: The present study aims at exposing Wistar rats to Fl and As and study the ameliorating effects of Ginkgobiloba on neurodegenerative changes.

Objectives: To determine the ameliorative effects of Ginkgobiloba on learning and memory impairment and Histomorphological changes induced by fluoride and Arsenic in Hippocampus and Cerebral cortex.

Materials & Methods: One month old Male Wistar rats 32 were used. The control rats treated with potable water. 120ppm of Fluoride and 70ppm of Arsenic were administered to animals through drinking water for 6 months. EGB was administered at the dose of 100mg/kg body weight orally using oral gavage needle.

Results:
- Learning & Memory ability declined in fluoride & arsenic treated rats compared with controls.
- Histomorphological changes of Hippocampus and Cerebral cortex in the control group neurons exhibited a clear nucleus and cytoplasm, In Fl & As treated rats shown Pyknotic cells. EGB treatment to fluoride and Arsenic intoxicated rats reverted the neurodegeneration and improved learning and memory ability.

Conclusion: Present study results revealed that rats treated with EGB showed amelioration in structure of brain against fluoride and Arsenic toxicity.

64. Study of Histology of Placenta in Sickle cell anemia.

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Background: The placenta forms a functional unit between the mother and the fetus and any pathological event that concerns the mother or the fetus will influence the normal function of the placenta resulting in morphological changes. There is paucity of literature on histopathology of placenta in sickle cell anaemia during pregnancy.

Aims and objectives: The present study was undertaken to analyse the spectrum of histopathological changes in placenta in sickle cell anaemia during pregnancy.

Methods: This prospective study on placenta from mothers with prior consent who delivered at SVN GMC, Yavatmal from January-2011 to September-2012 was undertaken in the department of Anatomy. 112 mothers willing to undergo the study were selected from the admission list and divided into two groups-(1) sickle cell anaemia group n=56, (2) Control group n=56 based on inclusion and exclusion criteria.

Results: The morphometric parameters viz. parental weight, placental diameter, placental thickness and umbilical cord length were reduced in placenta of sickle cell disease group as compared to control. Foetal wastage was found in sickle cell disease group.

Histopathological examination of placenta in sickle cell anaemia shows decreased villous vascularity, excessive syncytial knots, increased fibrinoid necrosis of the villi, increased villous stromal fibrosis and increased endarteritis obliterans of the foetal stem vessels. Other statistical analysis will be discussed in

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Background: Knowledge of morphometry of lip lining help in deciding the best site for choosing graft for its better uptake during several dermal grafting procedures, following craniofacial cancers or cosmetic procedures. It also prove useful in dermatopharmacokinetics, in which we monitor the effect of drugs acting on connective tissue by translabial route and lip augmentation surgeries(esthetic surgery) where care is to be given for dermal fillers not to be injected in muscle core of lip.

Aims and Objectives: To assess the genderwise microstructural anatomical differences in human upper lip under following parameters –epidermal thickness, stratum corneum, rete pegs, dermal thickness.

Methods and Materials: Ten human male cadavers and ten human female cadavers were procured. The rectangle shaped skin specimen through upper lip were stained with Haematoxylin and Eosin stain. Total of 40 slides were prepared. Readings were obtained with the help of CATCAM E series HD cameras which was installed in light microscope.

Result: Mean value of Thickness of skin (epidermis +dermis) of lip was 664.72 µm among males while 769.20 µm among females.

Conclusion: Epithelium of females is marginally thicker than males. Edp:sc (epidermis /stratum corneum) ratio can suggest that giving drug via translabial route will be easy in females as compared to males in upper lip as stratum corneum is the main barrier in drug transfusion and its absorption secondary to epidermis as a whole. Number of Rete Pegs per field at dermoepidermal junction was higher in males which ensures more stability of skin of male lip as compared to females.


Shivani Chawla¹, Dr.Mohan Singh², Dr.Garima Khatri³, Dr.Jaskaran Singh⁴

Background: Infertility affects 15% of couples globally. The male has been identified as a contributor to infertility in 40%–50% of infertile couples. It is attributed to male-factor associated causes have created a need for further studies and advancements in semen analysis. Sperm Morphology is an important factor to effect the fertility.

Aims and Objectives: The present study was to Compare efficacy of Giemsa and Papanicolaou stains to indicate better morphology of human spermatozoa.

Methods: The Present study was conduct in the Andrology Lab, Reproductive Biology Unit, Department Of Anatomy, SPMC, Bikaner, Rajasthan, India, to observe the comparison of human spermatozoa morphology according to WHO criteria we studied semen samples of 100 infertile males, collected by Private IVF Lab of Bikaner District, we used Geimsa and papanicolaou staining technique.

Results: All morphological parameters investigated by comparison of Geimsa and Papanicolou Stain (percent middle piece and tail abnormalities) correlated statistically significantly positive (P = 0.0001) but percent head abnormality was insignificant (P = 0.188). Head morphology was clearly seen but middle piece and tail
morphology were not clearly seen with Geimsa stain while head, middle piece and tail morphology were clearly seen by Papanicolaou stain. Papanicolaou stain excelled in both the efficacy and accuracy from the Geimsa Stain.

**Conclusions:** In Comparison the Papanicolaou Stain came out better and low time consuming as compare to Geimsa stain.

67. **A human cadaveric study: Communications between the median nerve and musculocutaneous nerve.**

_Yuvraj Sharma¹, Dr Chandrakala Agarwal², Dr Dhiraj Saxena³, Rahul Sharma⁴_

¹M.sc.(Med) student, Department of Anatomy, SMS medical college, Jaipur, Rajasthan; ²Senior Professor and Head of Department, Department of Anatomy, SMS medical college, Jaipur, Rajasthan; ³Senior Professor, Department of Anatomy, SMS medical college, Jaipur, Rajasthan; ⁴Senior demonstrator, Government medical college, Rajouri, Jammu and Kashmir.

**Background:** Branching pattern variations of brachial plexus may occur by abnormal formation in the development of different parts of brachial plexus (trunks, divisions and cords). The more common variations in the brachial plexus are in its gross form at the level of the junction or separation of its component parts. One of the common variation is presence of communicating branches between median nerve and musculocutaneous nerve.

**Aim and objectives:** In the present study an attempt has made to know the possible occurrence of variations in the communications between the median nerve and musculocutaneous nerve.

**Methods:** The present study was conducted by dissecting 50 upper limbs (25 right and 25 left) of 25 embalmed cadavers with an infraclavicular approach in the Department of Anatomy, S.M.S. Medical College and Hospital, Jaipur, Rajasthan.

**Results:** In present study 5 upper limbs the communication between median and musculocutaneous nerve was found in which 3 were on right side and 2 on left side, which forms 12% on right side and 8% on left side.

**Conclusion:** Although the variation of communication between musculocutaneous nerve and median nerve may not alter the normal functioning of the upper limb limbs but the knowledge of variations is to be kept in mind by anatomists, radiologists, surgeons, neurologist, orthopedician and anesthesiologists.

68. **Study of coronary artery dominance patterns in Western India – A cadaveric study**

_Dr. Vaibhav Bhatnagar, Dr. Seema Prakash, Dr. Ghanshyam Gupta, Dr. Lekhni Vyas_

**Background:** Dominance pattern of the heart has got important clinical significance. As minority of population are having ‘left coronary dominance’ and people who are having left coronary dominance are likely to be affected by coronary artery diseases, because the entire left ventricle and ventricular septum are under control of left coronary artery and obstruction of left coronary artery may produce output failure of systemic circulation.

**Aim and objectives:** Since there are few studies available to determine coronary artery dominance in Western India so keeping this in view present study was done to determine coronary artery dominance.

**Material and methods:** Descriptive type of Observational study was conducted in the Department of Anatomy R.N.T. Medical College, Udaipur (Rajasthan). 60 formalin fixed human cadaveric hearts following inclusion and exclusion criteria were dissected according to the protocol described in the Cunningham’s manual and the variations in the dominance pattern on the basis of origin of posterior interventricular artery
were noted.

**Result:** It was found that out of total heart specimens 88.33%, 6.67% and 5% heart specimens showed right dominance, left dominance and co-dominance respectively.

**Conclusion:** Considering high risk of mortality in left coronary dominance and co-dominance pattern, more prevalence of myocardial infarction in left coronary dominance and poor prognosis of left coronary dominance, the present study would be helpful to the cardiologists, radiologists and surgeons of western India.

**69. A cadaveric study on the morphology of human spleen.**  
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Postgraduate, Department of Anatomy, Andhra Medical College, Visakhapatnam.

**Background:** The spleen is a vital, large, and highly vascular lymphoid organ in the human body, located in the left hypochondrial region and performs various immunological and hematological functions.

**Aims and objectives:** To observe the morphology of the spleen with special reference to its shape, weight, length, breadth, width, and presence of notches on the superior and inferior border and their numbers.

**Material and Methods:** A total of 30 formalin preserved cadaveric spleens were studied for a period of two years (August 2018 to July 2020) in the Department of Anatomy, Andhra Medical College, Visakhapatnam.

**Results:** Various shapes of spleen were observed out of which wedge shape observed in 20 spleen specimens which was the most common shape in the present study. The length of the spleen ranged from 4.7cm to 16.2cm. The breadth of the spleen ranged from 3.7cm to 7.8cm. The width of spleen ranged from 2.6cm to 5.7cm. The weight of spleen ranged from 87g to 294g. The specimens of spleen showing notches on the superior border were 11 in number, on inferior border were 6 in number, on both borders were 9 in number and notches were absent in 2 spleen specimens.

**Conclusion:** The findings of present study impart important and fundamental knowledge about morphology of spleen to treating physicians, interventional radiologists, operating surgeon and clinical anatomists.

**70. Morphological variations of human liver: A Cadaveric Study**  
**Diwan RK, R K Verma, AK Pankaj, Anita Rani, Jyoti Chopra**  
Department of Anatomy, KGMU, Lucknow, UP.

**Background:** Liver, being the largest organ of body shows variety of gross morphological variations pertaining to lobes, fissures, enlarged papillary process and grooves in the anterior surface of liver which may be clinically significant.

**Aims and Objectives:** The aim of the present study is to determine the gross anatomical variations of liver in North Indian population.

**Material & Methods:** A total of 72 formalin fixed cadaveric livers were obtained from routine dissection. These specimens belonged to cadavers of unknown origins. Unhealthy and damaged livers were excluded from the study. The morphological variations of liver such as additional fissures in the lobes, enlarged papillary process, grooves on the anterior surface and pons hepatitis were noted.

**Results:** In the present study 50 (69.44%) livers exhibited one or other anomaly. 11 Enlarged papillary process (%), 7 hypertrophied caudate process (9.7%), 9 absence of quadrate lobes (12.5%), 4 additional lobe (5.5%), 6 elongated lobes (8.3%) and 5 grooves in the anterior surface (6.9%) were observed.
**Conclusion:** Documentation of the variations is essential as it would lead to clinical correlations in future. Awareness of these variations would help the surgeons and radiologist to avoid misdiagnosis of cases and unnecessary surgical complications.

71. **Variant Anatomy of Gonadal Veins : A Rare Scenario In The Cadaveric Study.**

**Dr. Tolupunoori Bhavani1, Dr. Sushma Daripelli1**

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**Background:** Anatomy of gonadal veins is of growing importance with an increased number of laparoscopic and open intra-abdominal surgical procedures. Gonadal veins display great variability concerning their course, number, and termination site. Here we report variations of gonadal veins which will help the radiologists and surgeons in recognition and protection of these veins, which play a major role in thermo-regulation, essential for the efficient functioning of the testis.

**Aims and Objectives:** To Explore the Gonadal Vasculature.

**Methods:** 35 cadavers were dissected as a part of Undergraduate and Postgraduate Course. The anomalies are observed as a part of routine dissection.

**Result:** 2 of the 35 cadavers had shown multiple gonadal veins.

**Conclusion:** Detailed knowledge of anatomy and anomalies of gonadal veins is necessary for vascular surgeons and radiologists. Gonadal veins present numeric variations which attribute to various pathological conditions like varicocele and pelvic congestion syndrome leading to infertility. The gonadal vein is also used as an autologous graft to substitute for the ureter. Hence in-depth awareness of the possible knowledge of these variations of gonadal veins is necessary for adequate surgical management which is useful for Radiologists, Urologists, Nephrologists, and surgeons in general.

72. **Morphological study of brachial artery in cadavers**

**Dr. Sushant Vanawat, Dr. Ghanshyam Gupta, Dr. Parveen Ojha, Dr. Vaibhav Bhatnagar**

**Background:** The brachial artery is the major blood vessel of the arm. Variations are important for surgeons to prevent complications. Knowledge of variations in branching pattern is must for all clinicians and especially for vascular and orthopedic surgeons to avoid complications like haemorrhage, ischemia and necrosis during various surgical procedures.

**Aims and Objectives:** The present study was done to study the origin, course and branching pattern of brachial artery in cadavers and clinical significance of these variations.

**Methods:** The present study was conducted on 100 upper limbs of 50 cadavers in the Department of Anatomy, R.N.T. Medical College, Udaipur (Raj) by conventional dissection method. Brachial artery was identified; cleaned & dissected and assessed the length of brachial artery, variation in the branching pattern and the course in relation to the median nerve was noted.

**Results:** The average length of the brachial artery was 26.83 cm. Double profunda brachii artery was noted in (1%); profunda brachii artery was branch of 3rd part of axillary artery in 2%, and profunda brachii artery was absent in 2% cases, whereas brachial artery crossed superficial to median nerve in 6% cases.

**Conclusions:** These variations may complicate arm surgical exposure, flap and vascular surgery. Hence, knowledge of possible variations in the branching pattern of various arteries is important during vascular and
73. Morphology and variations in branching of the internal iliac artery: Implications for Obstetric surgeries

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Introduction: Internal iliac artery (IIA) is given off by the common iliac artery at its bifurcation anterior to the pelvic brim at the level of the sacroiliac joint. The artery descends posteriorly within the pelvic cavity towards the greater sciatic foramen. At the upper border of this foramen, it ends by dividing into anterior and posterior divisions. Understanding the possible morphological patterns of the IIA in females would be helpful for obstetrician to perform pelvic interventions. This study aimed to describe variations of the internal iliac artery in western Maharashtra region.

Material & Methods: Ten pairs of right and left-sided hemi-pelvises from female cadavers were used in this study. We collected data on the internal iliac artery origin, relations, termination, branching, length and course of parietal and visceral branches. Data were then coded and entered into Graph pad prism software (version 7, California), where we performed descriptive statistics and analyses.

Results: The IIA consistently arose as a single trunk from the common iliac artery in all cases. The artery originated at different vertebral levels varying from L5 to S1. The average length of trunk of IIA from the origin to their division is 5.17±1.10 on both sides. We also observed that in two specimens the tortuosity of trunk of IIA and variations in branching patterns posterior division such as iliolumbar artery directly arose from the trunk IIA. The differences in dimensions of the IIA between the left (0.605±0.02) and the right (0.599±0.02) sides were not significant. Hence, we conclude that the Surgeons and radiologists performing vascular interventions in the pelvis should be mindful of these variations.

74. A Cadaveric study of perforators of arm to provide anatomical basis to skin flap design

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Background: The upper extremity is commonly involved in severe soft tissue defects which are challenging functional and cosmetic issue, variety of surgical techniques developed to repair these defects cosmetically by using tissue transfer. Study on skin vascularization provided the base for the development of flap nourished by perforating arteries thus preserving major vascular axis. The size, the distribution, and variability of cutaneous perforators of human body play pivotal role in designing of successful perforator flap, therefore it is mandatory for reconstructive surgeons to have details of vascular anatomy of cutaneous perforators of the upper arm.

Aims and Objectives: Locating, evaluating total number of perforators in the upper arm and measuring length of perforators from main source vessel in upper arm.

Methods: The study was undertaken in 15 upper limbs of fresh cadavers of both sexes of adult age group in the Department of Anatomy, KGMU, UP, Lucknow. Methylene blue dye was injected into the exposed axillary artery. After one hour, flaps were raised to visualize the stained perforators and there distances and
total length were measured from corresponding bony landmarks and source vessels respectively. Finally total number of perforators of individual source artery were counted and noted down.

**Results:** In present study we observed total of 152 perforators of upper arm of 15 upper limb of fresh cadavers with maximum distribution proximal to medial epicondyle of humerus having an average of $5.2 \pm 1.3$ perforators. Main source of perforators in the arm were contributed by direct branch of brachial artery (44.7%) while main source of perforators on medial, lateral, posterior superior and posterior inferior aspect of arm were brachial artery (61%), Posterior Radial Collateral Artery (65.1%), brachial artery (40.5%) and SUCA (59.5%) respectively. Mean length of perforator of Posterior Radial Collateral Artery ($44\pm14$ mm) supplying upper arm was largest.

**Conclusions:** The detailed understanding and knowledge of the vascular anatomy of perforators benefit reconstructive surgeons in harvesting skin flaps and achieve best functional and aesthetic results.

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**75. Active Learning Strategies to Enhance Student Engagement During Online Anatomy Learning**

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**Background:** COVID-19 pandemic had drifted Anatomy learning into a completely online mode. Although it is quite challenging to engage students during an online class and keep them motivated, incorporating active learning strategies would improve student engagement.

**Aims and Objectives:** To develop online active learning strategies and evaluate their impact in enhancing student engagement during online classes.

**Methods:** Two hundred and fifty first-year MBBS students participated in the study from April to December 2020. We designed three active learning strategies. The group activities included pre-class group/individual assignments and student presentations during the Neuroanatomy and Genetics classes. Barcode enabled end-class practice quizzes were planned as individual activities. Students created their groups and interacted online with their peers. We obtained student feedback through a semi-structured questionnaire.

**Results:** We received 40 Group and 51 individual assignments on the topic ‘cerebrum’. Each assignment was unique, and the description was beyond the mere textbook content. We received eight presentations for Genetics and two students from each group presented it in the online platform, and the faculty graded them and provided feedback. Individually, the students gave end-class quizzes during six online classes with five multiple-choice questions for each. The students found gradable online quizzes extremely useful for learning (N=110) followed by online group activities (N=48). Students opined that presenting on online platform gave them confidence and made learning easier.

**Conclusion:** The group assignment, practice quizzes, and student presentations allowed the students to participate actively during online classes and made the learning process enjoyable.

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**76. Assessment Using a Mobile App in the Anatomy Classroom: Students’ Perspective**

Arvind Kumar Pandey, Sushma Prabhath

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**Background:** Didactic lectures tend to be monotonous and end up making students lose interest and attention after a specific duration. Introducing certain technology enhanced learning activities may aid in making the
sessions more interactive and engaging. Usage of mobile apps for formative assessment is one such possibility to enable active learning.

**Aims and Objectives:** The present study aimed at seeking the students’ perception on the use of a mobile app for formative assessment in Anatomy lectures classes.

**Methods:** The study involved 250 first year medical undergraduate students, familiar with the use of the mobile app- ‘Kahoot’ in the Anatomy lecture classes for formative assessment. A semi-structured questionnaire was administered to seek the students’ perception on use of the app in Anatomy learning. The responses were recorded using a Likert’s scale. It also encouraged the students to express their opinion (in words) on the usefulness of the app.

**Results:** Hundred and thirteen students (49 males and 48 females) responded to the study by filling out the questionnaire. Majority of the students liked the idea of using ‘Kahoot’ in the lecture class (94.25%). Students also agreed to the fact that mobile apps such as Kahoot can make lecture classes interactive and learning fun (97.70%). They also stated that, such activities have evoked their interests in the lecture classes (83.90%) and would prefer the usage of such app in their future classes (97.70%).

**Conclusions:** Usage of mobile apps for formative assessment during Anatomy lecture sessions make it more interactive, engaging and learning fun.

### 77. Evaluation of newly introduced structured foundation course in MBBS curriculum at entry level in India: students’ perspective

**Ashima Das¹, Sibadatta Das²**

¹Associate Professor, Dept. of Anatomy, SHKM GMC, Nalhar, Haryana (India); ²Associate Professor, Dept. of Physiology, SHKM GMC, Nalhar, Haryana (India)

**Background:** One-month structured foundation course is an integral component of the newly designed CBME curriculum as proposed in “Graduate Medical Education Regulations-2019” by Medical Council of India. Purpose of this program is to assist fresh MBBS students in acclimatising to the new challenging environment of medical profession and in acquiring basic skills and professional attributes.

**Aims and Objective:** Study was aimed to evaluate the students’ perception regarding the knowledge and importance of different modules of foundation course and to assess the effectiveness and quality of the program.

**Materials and Methods:** A cross-sectional study was carried out among 120 first year MBBS students using pre-validated questionnaires. Pre questionnaire having three sections and post questionnaire having four sections were distributed at the start of course and towards the end of first year respectively using Google forms. Data was analyzed using SPSS version 22.0 and tests were done at a significance level of 5%.

**Results:** Mean scores of perceptions of knowledge and importance for all the modules increased after the course except for importance of Enhancement of language and computer skills module and the difference was statistically significant. Professionalism and ethics module was the most practically implemented module throughout the first year. Over-all rating of this one-month course was 3.31±0.78.

**Conclusion:** Feedback responses from students were indicative of the effectiveness of this program. This study sheds light on the significance of the foundation course in making the medical graduate an effective health care provider and physician of first contact of the community.
78. “Desire for Medical Gifting”- Qualitative Analysis of Attitudinal and Motivational Perspectives of Registered Whole-Body Donors.

**Swathi Poornima Chandaka, Professor, Department of Anatomy, Dr. Pinnamaneni SIMS & RF, Chinnaoutapalli, Krishna District, Andhra Pradesh.**

**Background:** It is highly appreciated that cadaveric dissections are of paramount importance for learning basic principles of Human Anatomy. Whole-Body donations therefore play a vital role for enhancing continuous medical education. We at Dr. Pinnamaneni SIMS & RF receive around 2-3 deceased bodies as donation every two months and as of present statistics there are around 435 bequest applications submitted and registered till date. This has ignited a surge to have an insight into the attitudes and motivational perspectives of registered whole-body donors.

**Objective:** To analyze qualitative aspect of attitudes and motivational perspectives of whole-body donors at Dr. Pinnamaneni SIMS & RF.

**Materials & Methods:** Study Design: Qualitative study. Participants: 56 registered whole-body donors, Sampling: purposive, Area of study: Dr. PSIMS & Rf, Method: In-depth interviews with open ended questions were conducted, the responses were documented as written transcripts. Thematic analysis was done through the process of coding in six phases to derive meaningful themes & patterns.

**Results:** The data documented through transcripts provided valuable themes which could be further categorized into sub-themes. Some of the prominent themes identified from the response data included desire for medical gifting, complex cultural beliefs, reducing burden of rites & rituals on immigrant children, self-motivation or self-interest, role model for future generations and societal appreciation.

**Conclusions:** Present study is a qualitative research which highlights the perspectives of whole-body donors. Though the responses appeared complex and multifaceted, the desire and motivation to support medical education and research stood primal. The self-motivated aspect with an interest to gain societal appreciation highlighted the altruistic aspect of the donors.

79. Identifying the role of picture based questions for assessment in Anatomy

**Gayatri Muthiyan, Payal Kasat, Aditya Tarnekar**

All India Institute of Medical Sciences, Nagpur

**Background:** Innovative technology has seen evolution of computer-based training programs to virtual learning environments. The COVID-19 pandemic lockdown has affected the scholastic system worldwide leading to closure of academy and alma mater. We had to move to the online assessments during this time. Multiple choice questions (MCQs) have been a preferred method of assessing student knowledge and understanding in the medical field for many years. Administering MCQs through online forms gave the opportunity to use more image based questions in the assessments.

Usually anatomical texts, atlases include diagrams and illustrations to explain the concepts; typically with minimal text. Even histology teaching is dependent on visual inputs; traditionally using light microscopy, in addition to textual information. Anatomy is learned through visualization (cadaveric dissections, microscopy, atlases, texts, ppts etc.). However, we continue to assess the students based on their ability to systematically write short and long answers and answer factual text based MCQs.

This COVID-19 pandemic lockdown has provided the opportunity to establish, the evidence with regard to use of picture based questions in theoretical assessments in Anatomy. Hence, the study was contemplated with the idea that inclusion of image based MCQs / questions would also aid in decreasing students anxiety levels. It can also help in covering major portion of the syllabus. This type of assessment has the potential to serve as
A learning tool.

**Aims:** The present research aims to assess the use of pictorial representations in theoretical assessments in Anatomy and to determine students’ perception about it.

**Methods:** Ninety five first year MBBS students participated in this study. A pre-test which was based on textual MCQs for superior extremity was conducted via online form. Following this a post test was conducted via online form. The questions of the pre-test were reframed with inclusion of relevant anatomical image to compile the questions for the post test.

Structured feedback regarding this pictorial assessment was taken from the students. Participation in the study was voluntary. Prior permission from the institutional ethics committee was obtained.

The data so obtained was tabulated. The descriptive analysis was done for the students’ feedback. Student t-test was used for content achievement based on pre and post test scores.

**Results and Conclusion:** Will be discussed during the presentation at IVACON conference

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80. A Comparative study of offline versus online teaching of Anatomy conducted on First year MBBS students of JNMC, AMU, Aligarh.

**Midhat Muttaqui¹, Nema Usman², Akansha Singh³**

1-Junior Resident, Department of Anatomy, Jawaharlal Nehru Medical College, AMU, Aligarh; 2-Assistant Professor, Department of Anatomy, Jawaharlal Nehru Medical College, AMU, Aligarh; 3-Senior Resident, Department of Anatomy, Jawaharlal Nehru Medical College, AMU, Aligarh.

**Background:** Location differentiates online and offline learning. With offline learning participants are required to travel to the learning location while online learning can be conducted without physical mobility to the learning location. The present scenario of corona pandemic has made it indispensable to continue the learning process through online platform.

**Aims and Objectives:** The present study is conducted to find out whether online learning is as effective as offline learning and to assess whether teaching Anatomy through online portal has affected their knowledge and to find out the ways for the improvement of learning.

**Methodology:** The study was conducted on two batches (2018 and 2019) of first year MBBS students of JNMC, AMU. The mean marks of the two batches will be calculated and compared.

**Result:** The mean marks of 2018 Batch were 65.67±12.224 while those of 2019 Batch were 58.57±11.806. The mean difference was 7.093 (p value<.001).

**Conclusion:** Offline teaching is better than online method.

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81. Assessment of Psychological Morbidity among First Year Medical Students

**Manmeet Singh, Vanita Gupta**

Acharya Shri Chander College of Medical Sciences, Jammu (J&K)

**Background:** Medical Curriculum is highly stressful. Stepping into a new environment, huge course syllabus which has to be mastered in a short period of time besides continuous assessments, examinations and othersocial and personal issues makes a newly joined medical student prone to develop negative emotionsymptoms.

**Aims and Objectives:** This study is an attempt to assess the level of depression, anxiety and stress among first year medical students.
**Methods:** A cross sectional study was conducted on 97 first year medical students of ASCOMS, Jammu, Jammu & Kashmir, India. Depression, anxiety and stress was assessed by administering a self-reporting DASS-42 questionnaire. Statistical analysis- SPSS version 16 was used for statistical analysis and Pearson Chi-square was applied for statistical significance.

**Results:** There was significant level of depression, anxiety and stress among first year medical students. The mean depression, anxiety and stress score was 1.31±1.38, 1.71±1.3 and 1.08±1.41 respectively. The prevalence of depression was 58.76%, anxiety was 69.07% % and stress was 54.63%. The incidence of depression and anxiety was highest which showed statistical significance (p<0.05) and females were affected more than males.

**Conclusions:** A significant proportion of first year medical students are affected with depression, anxiety and stress. The impact of negative emotional symptoms and the relevant contributing factors have to be understood. Early and timely intervention should be done addressing the negative psychological states.

82. **Prevalence and distribution of dominance and ramus intermedius in north Indian population on CT cardiac angiography**

Dewanshi Mishra¹, Dewansh Mishra²

¹Senior resident, King George’s Medical University, Lucknow; ²Junior resident, Dr RMLIMS, Lucknow

**Background:** Computed Tomography (CT) coronary angiography is used as a non-invasive method to evaluate coronary artery stenosis in patients presenting with cardiac symptoms and to look for coronary anatomy and its variations if any. It can also be used to decide coronary artery dominance which has various clinical implications like relatively higher death rates in left dominant coronary circulation. The most common variation of Left coronary artery is ramus intermedius seen in approximately 30% of cases.

**Aims & objectives:** of the study is to find the type of coronary artery dominance in male and female patients and to look for the prevalence of ramus intermedius in patients undergoing CT angiography for coronary artery disease following cardiac symptoms and to look for predominance based on gender if any.

**Methods:** 161 patients underwent CT coronary angiography on 64 slice Philips Brilliance CT scan machine in the Department of Radiodiagnosis were evaluated by experienced radiologists for the type of coronary dominance and the presence or absence of ramus intermedius.

**Results:** Out of 161 patients, right, left and codominance was present in 77%, 14.9%, and 8% respectively with no significant difference between the sexes. Ramus intermedius was present in 20.4% with a slight female predominance.

**Conclusion:** Right dominance was found to be in a greater number of subjects as compared to left dominance and co-dominance with no significant difference between both the sexes. Ramus intermedius came out as a common variation with a slight female predominance and higher prevalence among patients with co-dominant coronary circulation.

83. **A MRI Study of volume of Hippocampus**

Kumari Pooja, *Sushma Tomar, *Archana Rani

Ram Manohar Lohia Institute of Medical Sciences*KGMU, Lucknow.

**Background:** A MRI Study of volume of Hippocampus.

**Aims and Objective:** The aim of this study is to do genderwise comparison of right and left hippocampus volume in age 41-60 years. In this study, volume of hippocampus is measured in subjects not having any
Methods: This study was done in the Department of Anatomy in collaboration with Department of Radiology, KGMU, Lucknow, U.P. The study was done in 50 patients (24 females and 26 males) of age 41-60 years, who came with the complain of headache or epilepsy.

Results: Average of total volume of left side hippocampus was 5.87 cm³ and of right side was 6.54 cm³. In males, average volume of left side hippocampus was 6.23 cm³ and of right side was 7.43 cm³. In females average volume of left side hippocampus was 5.53 cm³ and of right side was 5.72 cm³. The total average hippocampus volume of males was 6.83 cm³ and in females was 5.62 cm³.

Conclusion: The total volume of left side hippocampus was less than that of right side. Also average right and left side volume of hippocampus was more in males than females.

84. Morphometric Analysis Of Macula In Different Age Groups And Gender In Indian Adult Population

Dr Shayama K Razdan, Prof. and Head, Department of Anatomy, HIMSR; Dr Shalini Kumar, Associate Professor, Department of Anatomy, HIMSR; Dr Taskin Khan, Associate Professor, Department of Ophthalmology, HIMSR; Dr Pareesa Rabbani, Postgraduate 2nd Year, HIMSR, New Delhi

Background: Histological morphometric analysis of retinal layers has inherent limitations that we face while processing the specimen. A new in-vivo technique, OCT has been developed, that can be used to analyse and differentiate normal and pathological retina.

Aims and Objectives: To do morphometric analysis of normal macula in adult population of India and study its variations on grounds of sex and age.

Methods: One hundred healthy adult subjects (19-65 years) underwent macular cube scanning using Zeiss SD-OCT. Macular thickness from all 9 regions of the Early Treatment Diabetic Retinopathy study map was documented for each subject. Variations in macular thickness by age and sex were determined both manually and automatically.

Results: The mean age of the subjects was 34.2 ± 13 (range, 19-65) years. The mean automatic central subfield thickness (CST) of all subjects was 239.52 ± 22.9μm and mean macular thickness was 284.73 ± 15.7μm. Mean CST measured manually was 167.75 ± 21.94μm and mean macular thickness was 167.75 ± 21.94μm. The mean CST in the right and left eyes were 238.04 ± 22.39μm and 241 ± 23.43μm, respectively (P <0.0001). Manual measurements for CST in the right and left eyes were 162.55 ± 23.52μm and 172.95 ± 18.96μm (P <0.0001). Males were associated with greater mean CST (manual and automatic) and mean macular thickness (manual and automatic compared with females (P <0.0001). There was no significant change in mean CST and mean macular thickness with increasing age (>30 years) (P=0.63). The automatic mean CST is significant with manual CST (P<0.0001).The automatic mean macular thickness is significant with manual macular thickness. (P< 0.0001).

Conclusions: This will serve as a normal data base in macula of Indians that has been created and found to be significantly different in already fed normal comparative data in SD OCT machine. It will help in analysing morphometry of macula and understanding macular pathologies in Indian eyes.
85. Evaluation of the role of various imaging modalities in the study of normal morphological anatomy of breast

Sanjula Singh, Sachin Mahur, Manjula Singh*

Department of Radiology, Maharani Laxmibai Medical College, Jhansi, UP, India;*Department of Anatomy, Government Medical College, Banda, UP, India

Aims & Objectives: Present study was done to evaluate the role of various imaging techniques in studying the normal morphological anatomy of the breast. As breast cancer is most commonly diagnosed cancer in women (24.1%) i.e. about 1 out of 4 new cancer cases. Therefore knowledge of normal anatomy of breast is necessary to distinguish normal from pathological structures.

Methods: In present study, images of breast were obtained from the department of Radiodiagnosis, MLB Medical College, Jhansi. This study comprises of 100 female subjects with age group between 35 to 50 yrs. Careful study of normal anatomy of breast was done in various radiological modalities like High resolution ultrasonography, mammography and MRI of breast to differentiate normal from pathological structures.

Result: These procedures and the knowledge of radiological anatomy of breast is helpful in early diagnosis and treatment of various pathological condition of breast and decreases the rate of morbidity and mortality.

Conclusion: Various diagnostic technologies has the purpose to diagnose malignant lesions in early stages, improving the prognosis of patients with breast cancer.

86. Placental Thickness Measurement by Ultrasonography and its Correlation with Gestational Age of Fetus in Manipuri Population

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Background: The placenta is the organ that facilitates nutrient and gas exchange between the maternal and fetal compartments. As the fetus begins the ninth week of development, its demands for nutritional and other factors increases, causing major changes in the placenta.

Aims and Objectives: To determine the correlation between the gestational age and placental thickness by means of ultrasonographic biometry in Manipuri population and to assess the role of placental thickness as a useful parameter for gestational age estimation.

Methods: The study was a cross sectional one with sample size of 134 pregnant aged between 20 and 40 years, and with known last menstrual period and singleton pregnancy, history of regular menstruation, no gynecological or obstetrical pathology. All recruited women were interrogated for baseline demographic data, obstetric history, screened for routine investigations and then ultrasonographic examination was done for evaluation of placental thickness at 11-40 weeks of gestation and data was entered in a pre-structured and preformed questionnaire. Institutional Ethical Committee approval was taken, and records were maintained with full confidentiality and consent form was duly filled in.

Results: The anterior placenta was maximum with 46% distribution. The mean placental thickness and standard deviation (±SD) in <14 weeks was 12.90 mm and (±1.26) respectively. From 14-27 weeks of gestation, the mean placental thickness was 21.56 mm and (±SD) was (± 4.56). For gestational age of > 27 weeks, the mean placental thickness and (±SD) value was 34.67 mm and (± 4.21).
Conclusions: The placental thickness and gestational age bear a linear and a direct relationship with \( p < 0.0001 \). Placental thickness bears a strong positive correlation with other fetal parameters like biparietal diameter, abdominal circumference, head circumference and femur length.

87. Morphometric Analysis of Lumbar Spinal Canal & its Clinical significance: A radiological study

Akhalaq Ahmed, Brijendra Singh, Kumar Satish Ravi

Background: Low back pain is a common health problem among individuals. Muscles impairment & spinal canal stenosis are most common causes of low back pain. Normal value of lumbar spinal canal ranges from 13-21mm in Anterior-Posterior direction & transverse diameter is more than 15mm. Present study was conducted to have a morphometry of spinal canal at lumbar region which may provide a better understanding of biomechanics of low backache.

Aim & Objectives: To estimate morphometry of lumbar spinal canal, Anterio-Posterior & transverse diameters.

Method: For present study 40 MRI scans were taken from the department of radio diagnosis. Anterior-Posterior (A-P) & Transverse diameter of spinal canal were measured at the level of lumbar inter vertebral disc (L4-L5, L5-S1) by using RadiAnt DICOM software.

Results: Out of 40 MRIs studied 23 were males & 17 were females. Minimum age was 15yr & maximum 75yrs with mean 42.85yr. Normal Spinal canal were found in 12 MRIs & spinal canal stenosis were found in 28 MRIs.

At L4-L5 level average anterio-posterior diameter was 10.90mm with standard deviation 4.64 & average transverse diameter was 11.93mm with standard deviation of 3.61, average anterio-posterior diameter was 10.72mm with standard deviation of 3.41 & average transverse diameter was 11.71mm with standard deviation of 3.12 at the level of L5-S1.

Conclusions: Lumbar spinal canal shows morphometric variations. Understanding of spinal canal morphometry and its correlation with muscles will be important to improve treatment modalities of low back pain.

88. Prevalence and distribution of dominance and ramus intermedius in north Indian population on CT cardiac angiographystudy of correlation of morphometric and radiological parameters of hyoid bone in the population of telangana.

Syeda Sadia Sameera

Background: Since modern facilities have improved the accuracy of measurement and study, this work correlates the radiological features from the dry specimens, as well as scanned images from living hyoid, will generate useful data for medico-legal and anthropometric uses.

Aim & Objectives: To correlate the morphometric and radiological parameters of adult hyoid bone in the population of Telangana.

Methods: 40 dried specimens of hyoid bones studied for the Parameters using vernier calliper and correlated in living using CT scan. parameters are Length of right greater cornu, Length of left greater cornu, Height of body of hyoid bone, length of body of hyoid bone.

Result:

All the morphometric parameters of hyoid bone correlate with the radiological parameters. There is no significant difference between the dry bone and ct scan measurements.
Conclusion—Data acquired from the study may be helpful for anthropometry and has medicolegal importance.

89. Exploring the perception of medical students on the utility and implications of plastinates for anatomical studies

**Dr. Najma Mobin**, Dr. Basavana Gowdappa.H, Dr. Madhu.B; Dr. Najma Mobin¹, Associate Professor, Department of Anatomy; Dr. Basavana Gowdappa. H¹, Principal & Professor, Department of Medicine; Dr. Madhu.B¹, Associate Professor, Department of Community Medicine; JSS MEDICAL COLLEGE, JSS Academy of higher education & research, S.S.Nagara, Bannimantap, MYSURU – 570015.Karnataka State. INDIA.

**Background**: In the recent years medical curriculum has changed considerably following the introduction of integrated teaching and giving importance to early clinical exposure. Presently e-learning, digital technology and plastinated models are being used for teaching & learning anatomy in many medical schools across the globe due to shortage of cadavers. In India very few medical schools are aware of plastination techniques & its implications.

**Aims & objectives**: The purpose of this study was to assess the awareness of plastination & to determine the perception of pre-clinical & clinical medical students on the use of plastinates as educational tools.

**Methodology**: This was a small group quasi-experimental study using structured, self-administered questionnaires with 5-point likert scale. The study was conducted on 70 medical students of our medical school.

**Results**: It was found that only 69% of pre-clinical students knew about Plastination and 51.3% of clinical students were not aware of plastination techniques. Only 60.60% of pre-clinical & 67.5% of clinical students strongly agreed that plastinates can replace the wet specimens in future, 93.93% of pre-clinical & 83.7% of clinical students strongly agreed that plastinates can be included in the present curriculum for better understanding of the subject. The medical students strongly agreed that both wet specimens and plastinates combined together are better learning tools for anatomical studies.

**Conclusions**: We can conclude that plastinates can be useful only as adjunct tools along with the wet specimens for anatomical studies. This study will benefit the studies that will assess the effectiveness of plastinates in anatomy education.

90. Framing of Multiple-Choice Questions by medical students: A strategy for active learning during COVID-19 pandemic lockdown

**Payal Kasat¹, G Muthiyan², AM Tarnekar³**

1 Senior Resident, 2 Associate Professor, 3 Professor and Head, Department of Anatomy, AIIMS NAGPUR

**Introduction**: Innovative technology has seen evolution of computer-based training programs to virtual learning environments.¹ The COVID-19 pandemic lockdown affected the scholastic system worldwide leading to closure of academy and alma mater. Hence, it necessitated to implement teaching learning methods in which students play a major role in their active learning. Multiple choice questions (MCQs) have been a preferred method of assessing student knowledge and understanding in the medical field for many years. The student-generated MCQs has a documented benefit of development of deeper understanding of the content learned and sense of ownership for the content. It also helps in covering major portion of the syllabus.²³

**Aim**: To assess the framing of multiple-choice questions by medical students as an active learning strategy and to determine their perception about this activity during COVID-19 pandemic lockdown.
Methods: 99 first year MBBS students participated in this study. A pre-test which was based on MCQs for the broad region for example SUPERIOR EXTREMITY was conducted. Students were divided into 8 groups. Each group comprised around 7 to 10 students. Broad regions were divided into five - six major topics, which were further divided into sub-topics. Each group of students was allotted one major topic. The students were expected to frame minimum six questions of various types on the chosen subtopic. The questions had to be self-made and copying from any source whatsoever was NOT permitted. These had to be submitted online. The students were given adequate time to read the entire SUPERIOR EXTREMITY portion in Anatomy. While doing so they were asked to mark likely questions in their textbook itself. Following this a post test was conducted via online forms.

The questions that were received online were thoroughly scrutinized. These were then compiled and shared with all the students. Feedback regarding this activity was taken from the students. The descriptive analysis was done for the students’ feedback. Student t-test was used for content achievement based on pre- and post-test scores.

Results and Conclusion: There was improvement in the scores of students in the post-test compared to the pre-test. The students steadily, vigorously and positively participated in this activity. This also helped them to revise and to prepare for the university/ professional examinations in turn decreasing their anxiety levels. Thus, the student contributing via framing of multiple-choice questions served as a strategy for active learning during COVID-19 pandemic.

91. Plastination, a modern teaching tool: To study cross-sectional anatomy with corresponding MRI images.

Dr. Poornima Kalla, Dr. Sushma Kushal Kataria

Background: In the present study the potentials of plastinated cross-section specimens of thorax and their corresponding MRI images were compared, and its use in teaching cross-sectional anatomy to undergraduate medical students.

Aims and Objectives: To find and compare the learning outcomes of study group and control group of first year undergraduate medical students with help of plastinated cross-section of thoracic inlet and T3 specimens and their corresponding MRI images.

Material and Method: 100 students (50 control and 50 study) of first year undergraduate medical students of Dr. S.N. Medical College were selected for study in department of Anatomy. Cross-sectional anatomy of thorax were taught to study and control group with the help of plastinated specimens and MRI images. After that theory assessment was conducted to evaluate the learning outcomes and data was collected and analyzed.

Result: After analyzing, the increase in mean marks from control to study group was noticed, reveals plastinated cross-section of thoracic inlet and T3 specimens enhanced the study of cross-sectional anatomy in relation to MRI images.

Conclusion: Plastination in modern time act as important tool for both teaching and preservation. Teaching anatomy along with various adjunct increase depth of relational and cross-sectional anatomical knowledge of undergraduate students.
92. A Delphi consensus study to identify most valuable assessment tools to assess anatomy competencies in CBME curriculum

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*Prof & HOD, ** Assistant Professor, Department of Anatomy, JSS Medical College, JSSAHER, Mysore

**Background:** Over recent years, wide ranging changes have occurred in undergraduate medical curricula with reduction of hours allocated for teaching anatomy. Anatomy forms the foundation of clinical practice. However, the challenge of acquiring sufficient anatomical knowledge in undergraduate medical education for safe and competent clinical practice remains. Standard setting in examination is the procedure to determine the passing score; the value that differentiate the competent from the non-competent. The present study was undertaken to identify most appropriate assessment tools to assess anatomy competencies in CBME curriculum.

**Methods:** Modified Delphi technique with three rounds involving twenty renowned anatomists across the country was conducted. Anatomy assessment tools were generated from the opinions of this expert panel in the first round and its relevance of these tools were rated with a four point Likert scale in the subsequent two rounds to generate consensus.

**Results:** Response rates were 90% for the first round and 100% for the next two rounds. After three Delphi rounds, seven assessment tools were identified as most valuable following iteration.

**Conclusions:** The findings of this study provide anatomists regarding the current required essential assessment tools for assessing the anatomy competencies of higher order cognitive domains and psychomotor domain for CBME curriculum.

93. E-Learning in Medical Anatomy during COVID-19 Pandemic


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**Background:** WHO declared COVID-19 a pandemic on March 11th, 2020. The disease has increase drapidly reporting numerous active cases all over world. To prevent the COVID-19 spread, Indian government declared the emergency state on 24 March 2020. All educational institutions have been closed including medical colleges. Due to which, Distance E-learning surfaced as a new method to take classes in various education institutes including medical colleges during the COVID-19.

**Aim:** This study will aim to understand distance E-learning among medical students during their 1st years and to identify possible challenges, limitations, satisfaction as well as perspectives for this approach to learning.

**Methods:** This is based on a questionnaire in Google form that was designed and delivered to medical students of 1st year (2019-2020) Batch of 250 students through whatsapp.

**Results:** 250 students were given the questionnaire. The satisfaction rate in medical distance learning was significantly higher in students with previous experience in distance learning in their schools as well as when Faculty were actively participating in learning sessions, using multimedia and devoting adequate time for their session and main challenge reported by students was internet/network availability and compatible devices etc.

**Conclusion:** The study represent an optimal solution for learning processes in emergency situations such as
pandemic and analyzing technological, financial, institutional, educators, and student barriers are essential for the successful implementation of distance learning in medical education.

94. Evaluation of Feedback by first year MBBS students – A study on implemented one month foundation course

Roli Joshi, Pankaj Singh, Vinod Kumar
Saraswati Medical College, Unnao

Background and Aim: To study the feedback of students after attending the foundation course as designed by MEDICAL COUNCIL OF INDIA. It is mandatory one month programme in first year MBBS curriculum. The beginning of the First phase of the course enables the students to acquire the basic knowledge and skills required for all medical students going to be professionals.

Methodology: 150 students of First professional MBBS batch 2019 who attended this course over a period of 30 days. A predesigned, pre tested questionnaire was given to the students before and after the completion of one month of foundation course.

Results: Feedback was positive 92 to 98.5% regarding the importance of feedback session. The mean scores of the knowledge and importance of the topics included in module were 1.2±0.440 before the foundation course but after wards the scores increased to 3.8 ±1.7 respectively and the relation between them is found to be statistically significant p<0.001. Objectives of the course, contents, presentation, encouragement, future value of the course in the student’s career by a Questionnaire issued to the students.

Conclusion: The Foundation Course at the beginning of the medical entry enables the knowledge of students to acquire the devotion, basics and skills required for all the subsequent phases in MBBS course and later on their medical practice, behaviour and career. Rating for the foundation course indicates that feedback response of newly admitted students was very satisfactory and encouraging.

95. Concept Mapping: An Activity to Foster concepts, Ideas, and Relationships of Anatomical Structures in Medical Undergraduates

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Background: The COVID 19 pandemic upturned every walk of life, including medical education, causing an unprecedented education crisis. Synchronous and asynchronous modes of learning combined to deliver the curriculum.

Aims and Objectives: To understand the perceptions of students towards the usage of concept maps in in-depth learning of anatomy.

Methods: Followed by one hour lecture on the anterior abdominal wall, students were assigned to construct a concept map on the Rectus sheath within the span of three days. The early bird and best 3 submissions were awarded. Perceptions of students towards concept map were recorded using a closed-ended questionnaire. Data were analyzed using semi-quantitative thematic analysis.

Results: Positive student perceptions (n= 91) indicated that this approach had enhanced conceptual learning in anatomy.

Conclusion: The outcome of the study will have wide-ranging implications in post-pandemic blended curricula.
96. A true insight into the morphological variations of human liver

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Background: The existing data on the surface variations of liver is still contradictory. A sound knowledge of these variations would aid the surgeons and radiologists to circumvent the misdiagnosis and complications during surgeries.

Aims and Objectives: To study the surface morphological variations of cadaveric livers.

Methods: The study was conducted in 93 cadaveric livers. Minor liver fissures, Accessory fissures and lobes were noted along with the dimensions. The livers were classified according to the Netter’s classification. The morphology of caudate and quadrate lobes were studied. Any other variations in the appearance of groove for Inferior vena cava, gall bladder & its fossa were also studied. The results are tabulated.

Results: The study revealed several variations in the morphological features of liver. Accessory fissures were noted in 51.61% of livers, distributed on various liver surfaces. Accessory lobes were noted in 27.9%. Pons hepatitis was present in 22.5%. Gall bladder variations that were noted include the Hartmann’s pouch (n=14; 15.05%) and the Phrygian cap (n=2; 2.15%). 65.6% livers (n=61) had the fissure of Gans or Rouviere sulcus which is a normal fissure present in majority of normal healthy livers.

Conclusions: The current study provides a complete understanding and a thorough knowledge of surface morphological variations in liver. We hope that this will be greatly helpful for surgeons and radiologists to avoid possible errors in interpretations, to plan appropriately and assist during liver surgeries and to do radiological interventions.

97. A cadaveric study on Branching pattern of Terminal branches of Facial nerve

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Background: For a successful facial surgery, it is vital to have a good knowledge of the distribution of the facial nerve in face.

Aims and objectives: To highlight the pattern in the branching of end part of facial nerve in adults and fetuses and to look for any anastomoses between them. Branching pattern in the two groups are compared for any significant association.

Methods and Material: Done in 100 facial halves of adult and fetus specimens.

Statistical analysis used: Analyzed for any significance in the variations in the branching pattern with respect to gender and side of face using Chi-square test.

Results: The branching pattern was classified to 6 types as per Davis et al classification in the two study groups - adults and fetuses. The frequencies of occurrence in the first group was Type I- 1%, Type II- 7%, Type III-18%, Type IV-17%, Type V-4%, Type VI-3% and in the second group was Type I- 1%, Type II - 8%, Type III- 20%, Type IV- 15%, Type V - 5% and Type VI- 1%. No significant association was found in the branching pattern with respect to gender and side of face in two groups of study.

Conclusions: There are multiple anastomotic communications among the end branches of facial nerve. More the anatomical knowledge of these communications, lesser will be any unwanted facial nerve injury.
98. A South Indian Cadaveric Study on anatomic characteristics of Corona Mortis and its Clinical Significance

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Background: The Corona mortis is the vascular connection between the obturator and external iliac system. Although this connection is regarded as arterial, it can be arterial, venous or both. Corona Mortis is located on the superior ramus of pubis and has its surgical importance in hernia repair, trauma and orthopaedic approaches.

Aims & Objectives: The objective of this study is to estimate the incidence and location of Corona mortis in south Indian population, to determine the differences between males and females and to understand its clinical significance.

Materials & Methods: The present study was done on 55 adult cadaveric hemipelvises obtained from the Department of anatomy, Rajarajeswari Medical College & Hospital. Dissection of pelvis was done to trace the Internal & External Iliac vessels, obturator artery & vein. Corona mortis was observed on pelvic surface of superior pubic ramus, number of venous and arterial anastomosis were noted.

Results: The Corona Mortis was observed in 35 out of 55 specimens (63.63%). Vessels which measured more than 1mm in diameter, which connected the Obturator and external iliac systems, were noted in all the specimens. Vessels 1mm or greater in diameter were noted in 14 out of 55 specimens.

Conclusion: Corona Mortis is an important anatomic variant which the surgeons must be aware of especially in minimally invasive surgeries and Femoral hernia repair as it is prone to injury.


Divasha, Sonia, MukeshSingla, Kumar Satish Ravi

An ideal method of exploring the surgical anatomy and the variations organs and neurovascular structure is the human cadaver. The unblemished knowledge of vascular pattern and its variations is substantial.

Ordinarily, Obturator artery (OA) comes from anterior division of internal iliac artery or one of the parietal twigs of internal iliac artery (IIA). A comprehensive understanding and knowledge of retro pubic pelvic vascular anatomy is essential for successful performance of endoscopic total extra peritoneal inguinal hernioplastic, as well as for laparoscopic herniorrhaphy.

Materials and Methods: This study was conducted on 30 hemi pelvises of 15 adult cadavers, independent of age and sex dissected as per Cunningham’s manual of dissection in the department of Anatomy, AIIMS, Rishikesh. During the dissection, origin and course of the obturator artery were traced.

Observation and Result: In 53% specimens out of the 30 pelvic halves, the obturator artery originated from the anterior division of the internal iliac artery. In 17% of cases OA was arising from inferior epigastric artery, in 7% cases it took origin from common trunk of IIA and in 13% of specimens it originated from the posterior division of IIA. Though, in the remaining 6% of the specimens, both the superior and inferior gluteal arteries give rise to obturator artery.

Conclusion: The present study revealed the origin of the obturator artery is highly variable. The surgeons who deal with the direct, indirect, femoral and obturator hernias need to have a clear understanding and knowledge about its variations and relation to the femoral ring. Due to its highly variable origin, this could be a cause of serious medical interventions, as such aberrant origins may be a significant source of bleeding during surgical interventions in the region.
100. An anatomical study of the nutrient foramen of adult human tibia

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**Background:** The nutrient artery for tibia is one of the largest nutrient vessel in the body. It enters the tibia through its nutrient foramen located over its proximal third, on its posterior surface, runs through nutrient canal and then enters the medullary cavity in the middle third of tibia.

**Aims and Objectives:** The aim of the present study was to determine the location, number and position of the nutrient foramen of tibia.

**Methods:** The study was conducted in the anatomy department of Government medical college, Ratlam, M.P. Dry, preserved adult tibia bones of unknown age and sex were randomly selected. 60 tibia bones were studied, out of which 31 were of left side and 29 of the right side. The presence of nutrient foramen was observed macroscopically and confirmed by passing a 24 guage needle tip through it. Then, its number, location, position and direction were noted.

**Results:** Single nutrient foramen with downward directed nutrient canal was observed in all but one bone (one case of each exception). The foramen was present on the posterior surface in 93% of cases, and on the upper third of the bone in 98% of cases.

**Conclusions:** Damage to the nutrient artery during fracture or surgical procedures may lead to delayed union or nonunion. Hence, the knowledge of the anatomy of nutrient foramen should be kept in mind during surgical procedures involving tibia.

101. Morphological variations of liver in humans and its surgical relevance

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**Background:** The knowledge of normal and variant anatomy of the liver is important during radiological investigation and surgery. Variations in the liver morphology can be either congenital or acquired. The common congenital anomalies in liver are agenesis of the lobes, absence of segments, deformed lobes, smaller lobes, atrophy of the lobes and hypoplastic lobes. It is mainly due to defective development or excessive development and sometimes these deformities are present with abnormality of diaphragm and suspensory apparatus of the liver. Though variation in the branching pattern of the hepatobiliary system has been extensively studied, the morphological variations of the liver have not been studied at length.

**Aims and objects:** This study aims to determine the gross anatomical variations of the liver in human cadavers

The objectives of the study are:

1. To determine the morphological variations of liver
2. To determine the segmental anatomy of liver and surgical relevance
3. To determine the presence of sulci, fissures, notches and enlargements of lobes in liver

**Methods:** The study was conducted in the Department of Anatomy of our institution after obtaining the ethical clearance. 100 liver specimens in the Department were used for the study. The morphological variations of the
liver such as changes in size and shape, presence of pons heptatis, accessory lobes and fissures were noted. Photographs were taken to document the variations. The results obtained were then tabulated.

**Results:** The fissures in right lobe was 38 % and left lobe 13%, caudate lobe fissures were 6 % and quadrate lobe was 21%, pons heptatis was 21%. Grooves in the anterior surface was 9%. Conical shaped right lobes were 28% and notched border was 10%. Elongated left lobe was 17% and quadrate lobe with tongue projection was 15%, bilobed quadrate lobe was 5% and accessory lobe was 9 %.

According to Netter’s classification, type 1 livers were 50%, type 2 was 20%, type 3 was nil, type 4 was 5%, type 5 was 3 %, type 6 was 12% and type 7 was 10%.

**Conclusions:** Knowledge of such variations is also important as these do not always remain clinically latent though most often it may be clinically asymptomatic. Awareness of these variations would help both the surgeons and radiologists to avoid misdiagnosis of cases and unnecessary surgical complications.

102. **Morphological study of chordae tendinea of human AV valves**

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**Background:** Chordae tendinea (CT) are strong cord-like fibro-collagenous structures between valve leaflets and papillary muscles (PM). They are critical in conveying the systolic contraction of the PM to the valve and therefore prevent the collapse and regurgitation. Disintegration of CT can affect the valve competence.

**Aims and Objectives:** To study the number, length, types and branching pattern of chordae tendinea.

**Methods:** The study was carried out on 100 formalin fixed hearts regardless of sex. Dissection was performed according to standard techniques. CT were observed on the basis of number, length, types and branching pattern.

**Results:** The mean number of CT attached to anterior cusp were found to be 12.24 in LAVV and 14.81 in RAVV, in posterior cusp 12.39 in LAVV and 12.62 in RAVV, in accessory cusp 12.75 in LAVV and 9.17 in RAVV. In case of RAVV, the mean number of CT found in septal cusp were 10.96.

For RAVV, length of the largest and the shortest CT of tricuspid heart valves were significantly higher than those of LAVV. For posterior heart valves, length of the largest CT was significantly higher in LAVV as compared to RAVV. 4 types of CT were found i.e., muscular, tendinous and membranous. The branching pattern observed were straight, branched, spiral and web forming.

**Conclusion:** This knowledge would help cardiac surgeon during procedures like chordal cutting and chordal dislocation for correction of valve dysfunctions.

103. **Morphometry of nutrient foramina of human long bones of leg and its clinical relevance**

**Anam Ahmad**, **Punita Manik**, **Anita Rani**, **Rakesh Kumar Diwan**, **Rakesh Kumar Verma**, **Garima Sehgal**

**Introduction:** The nutrient foramina of bones is useful for surgical procedure suchas microvascular bone grafts to preserve the circulation.

**Aims and Objectives:** The objective of present study is to study the morphology of nutrient foramina in bony
specimens which is helpful for clinicians involved in vascular bone grafts.

**Material and Method:** The study was conducted in total 100 bones including 50 tibia and 50 fibula (25 of each side). The study was conducted using osteometric board for measuring the length of the bone along with the location of nutrient foramina and the calculation of foraminial index. The nutrient foramina was seen through naked eyes in natural light. The material collected for our study was from the Department of Anatomy, King George’s Medical University, U.P. Lucknow.

**Result:** The nutrient foramina in case of tibia, 99.6% showed single foramen and in 2.5% cases it was absent. With respect to fibula 90.2% had single foramin and 8.4% has no foramen while in 1.4% cases there were multiple foramen.

**Conclusion:** The study provides information about the morphometry of nutrient foramina in lower limb leg bones. The foramina of tibia were commonly observed at its upper part, whereas in fibula they were present in the lower part. This provides information during surgical procedures.

**104. Morphometric and topographical analysis of the nutrient foramen of dry adult human radius bones in Belagavi region and its clinical significance.**

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**Background:** Radius is a long bone of forearm, present laterally. Arterial supply to the long bones, which is clinically important, is chiefly by the nutrient foramen.

**Aims & Objectives:** To determine various parameters of the nutrient foramen of the dry adult human radius bone.

**Methods:** 200 dry adult human radius bones of unknown sex and age (100 each side) were collected from the Department of Anatomy, KAHER’S JNMC, Belagavi, Karnataka. All bones were carefully assessed for the number of nutrient foramina present, (its location, direction, size, distance from both the ends) and length of the bone using digital vernier caliper, measuring tape, hypodermic needles of different gauges. Foraminal index was calculated using the Hughes formula.

**Results:** Single nutrient foramen was found mostly, double in 7% of each side, triple in 2% of left radius only while it is absent in 4% of left and 5% of right radii. It is located majorly on anterior border, followed by posterior surface in left (14%) and interosseous border in the right (13%). Mostly, it was present in the middle 1/3rd of the shaft. Small sized foramen was found significantly.

**Conclusion:** This study will provide important data regarding the nutrient foramina to the radiologists to ensure precise interpretation of the radiological images and for orthopedicians for successful procedures like bone grafts, fracture healing, microsurgical vascularized bone transplantation etc.

**105. Single center morphometric study of sacral hiatus and its correlation with caudal epidural block**

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**Introduction:** Sacrum is a wedge shaped bone formed by the fusion of five sacral vertebrae, forming caudal
end of vertebral coloumn. Sacral hiatus is an opening present at the caudal end of sacral canal.

Sacral hiatus is clinically important for caudal epidural block in orthopedic and obstetric surgeries. Success and failure of caudal epidural block varies with the anatomical variation in sacral hiatus.

This study will help to determine the anatomical variation of sacral hiatus and its effect on caudal epidural block.

**Aim:** To study the anatomical variation of sacral hiatus in relation with caudal epidural block.

**Method:** The sacral hiatus of 35 dried sacrum bone of unknown sex were studied at Department of Anatomy, SMS Medical College, Jaipur. The parameters assessed were: shape of the sacral hiatus, level of apex and base, length and anteroposterior diameter (AP) at apex.

**Result:** Inverted “U” shape of sacral hiatus was most commonly encountered. Apex and Base of the hiatus were commonly seen at S4 and S5 vertebra level respectively. Length of sacral hiatus ranged between 4.9 mm to 51 mm. AP diameter at apex ranged between 2mm - 8.4 mm.

**Conclusion:** The present study concluded that there are anatomical variations in shape and level of sacral hiatus. Knowledge of these variants may improve the reliability and success of caudal epidural block.

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106. Establishing Anatomical proximity between mitral valve annulus and circumflex artery – implications to mitral valve surgery

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**Background:** Mitral valve surgery is associated with risk of acute myocardial infarction and iatrogenic injury of circumflex artery (CFA).

Previous studies shown there is relationship between distance of the mitral valve annulus (MVA) and CFA and dominance pattern of coronary arteries.

But number of patients studied is small.

**Aim & Objectives:** To Establish a standardized anatomical distance of CFA to the MVA and to elucidate link between coronary dominance and CFA-MVA relationship in a clinically relevant context.

**Methods:** 100 adult human hearts were procured from Forensic department of Rajarajeshwari medical college. Coronary artery dominance pattern was evaluated. Left atriotomy was performed and three measurements were performed to characterize MVA: anterior-posterior length, inter-commissural length, circumference.

In order to report anatomical data in a clinically relevant context, a standardized clock face used in cardiothoracic surgery will be visually overlain on the mitral valve annulus.

Then distance between CFA and MVA will be measured at each hour on clock face where artery is present.

**Results:** CFA was closest to MVA across all hearts at P1 leaflet (8 o'clock) position. In right dominant hearts CFA was closest at anterior commissure (10 o'clock) position. In left dominant hearts CFA was closest at P3 leaflet (3 o'clock) position. Overall CFA was closest in left dominant arteries and in female hearts.

**Conclusions:** This study provides better understanding of CFA-MVA relationship and prevents iatrogenic damage to CFA, thereby helps cardiac surgeons to prevent operative complications. This study supports previous anatomical findings which states that left dominant hearts shows closer anatomical relationship between CFA and MVA.
107. Coccygeal Sacralisation – A Study

Dr. Shaheen Rizvi, PG Student

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Background: The coccyges are a series of rudimentary vertebrae forming the caudal termination of the vertebral column. At the cranial end of the sacrum when L5 fuses with S1, it is termed as Lumbar sacralisation. At the caudal end of sacrum, when first coccygeal vertebra fuses with the S5 it is termed as coccygeal sacralisation. Hence when sacrum comprises of six vertebrae, it is always due to the loss of a vertebra from the lumbar region or coccygeal region. There is hardly any literature available related to the coccygeal region.

Aims and Objectives: To study the variations at the caudal end of the sacrum.

Materials and Methods: Total fifty adult dry human sacra with attached coccyx were examined in the Department of Anatomy of K. J. Somaiya Medical College with respect to five pairs of sacral foramina. Those vertebrae which exhibited lumbar sacralisation were excluded. Various types will be discussed at the time of paper presentation.

Observations: Eight sacra showed coccygeal sacralisation (16%) of which 4 (8%) were Type I showing complete fusion, 2 (4%) was of Type II showing incomplete fusion medially and 2 (4%) was of Type III showing incomplete fusion laterally.

Conclusion: The classifications in the present study range from complete fusion of vertebrae to incomplete fusion of parts of the vertebrae. This is essential for diagnosis of sacralisation related diseases to understand the degree of ossification and the extent of fusion. Sacralisation of coccygeal vertebra may cause coccygodynia, caudal block failure, difficult second stage of labour, a difficult forceps delivery and perineal tear. Thus knowledge of sacralisation of lumbar and coccygeal vertebra is of utmost importance to anatomist, orthopaedicians, physicians, surgeons and obstetricians.

108. Morphometric study of sacral hiatus and its clinical insinuation in the caudal epidural anaesthesia

Sameeullah Bin Azeem Hassan, Akhalaq Ahmed, MukeshSingla, Kumar Satish Ravi.

Background: Sacrum is a large triangular bone formed by the fusion of five sacral vertebrae and forms the caudal end of the vertebral column. The sacral hiatus is formed by incomplete fusion of the posterior elements of the fourth or fifth sacral vertebra. It’s an essential landmark for inoculating caudal epidural anaesthesia or analgesia in patients with low back pain, in obstetrics as well as in the orthopaedic surgeries.

Aim and Objective: To study the morphometric measurements of sacral hiatus for inoculating caudal epidural anaesthesia.

Methods: 46 dry human sacra of adults were studied. Various anatomical measurements were taken with the help of digital Vernier calliper, accuracy (0.1mm).

Results: Measurements and shape of 46 sacral hiatus were studied. V-Shaped hiatus was found predominantly followed by U shape. The maximum length of hiatus from base to the apex was 3.9 cm and a minimum of 1.5cm. Level of the apex of hiatus was found mostly at S-4 level (49%) followed by S-3(18%). Level of the base of hiatus at S-5(75%) followed by S4-S5 joint. Other measurements taken are the transverse, anteroposterior measurement of sacral hiatus. Antero-posterior and transverse measurements of the spinal canal were also taken

Conclusion: Sacral hiatus shows morphometric variations in various populations. Understanding and

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Background: The use of gastrocnemius muscle flaps have started to become popular amongst surgeons hence it becomes of utmost importance to understand its blood supply to make the flap viable. However lateral head of gastrocnemius flap is less commonly used as it was considered that lateral sural artery is not a reliable source of giving musculocutaneous perforators.

Aims and Objectives: To study the morphometry of lateral sural artery and its musculocutaneous perforators throughout the length of gastrocnemius.

Material and Method: 6 fresh and 6 embalmed adult cadavers of both the sexes were dissected following injection of colored latex in the popliteal artery and lateral sural artery and it musculocutaneous perforators were observed

Results: The lateral sural artery (LSA) was present in 100% cases. The distance of LSA from the mid-condylar point was more in males (0.46 ± 0.49mm) than in females (0.22 ± 0.36 mm). The distance of origin of perforators of LSA from the mid condylar line in males (54.45±9.36 mm) was more than in females (52.85±5.25). The mean diameter of LSA was found to be almost the same in females (2.48 ±0.24mm) and males (2.54±0.14mm). The mean diameter of perforators of the LSA was more in males (1.50±0.07mm) than in females (1.43±0.10mm).

Conclusion: In 100% subjects 3-4 musculocutaneous perforators originated from LSA supplying the Gastrocnemius, hence we can say LSA is a reliable source for flap design.

110. A Cadaveric study on plantaris muscle with its clinical significance.

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Background: The Plantaris is a superficial muscle of posterior compartment of leg. It is a vestigial muscle, has a small belly and long slender tendon. It arises from lower part of lateral supracondylar line and oblique popliteal ligament, tendon runs obliquely inferomedially between gastrocnemius and soleus and inserts in a calcaneum medial to calcaneal tendon. Aims and objectives - The Present study was aimed for detailed anatomical study on plantaris muscle and to observe variations of muscle in cadavers.

Methods: For present study ninety (45 right and 45 left) knee joints were dissected. In posterolateral aspect of knee plantaris was dissected; morphometric measurements were taken by digital Vernier caliper, anatomical variations were observed. Obtained data were analyzed statistically.

Results: Plantaris muscle was present in all cadavers. Double plantaris was found in one of knee joint. Mean length of belly and tendon of muscle was found 8.3cm and 38.46cm respectively. Mean width of belly and tendon of muscle was found 5.5cm and 0.9cm respectively. Mean length of from proximal to distal attachment
was 41.6cm.

**Conclusions:** Plantaris muscle is the choice of graft in reconstruction surgery of anterior talofibular and calcaneofibular ligament, tendon transfer for flexor tendon in hand and in atrioventricular repair and hence anatomical knowledge of muscle is of great importance to surgeon, orthopedic surgeon, radiologist and physical therapist. The knowledge of anatomical variations is of great importance to anthropologist to understand the evolutionary changes in lower limb and knee joint.

111. **Stereological estimation of the neurons of the left stellate ganglion after artificial myocardial hypertrophy in rats.**

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Pt B D S PGIMS, Rohtak and SGT Medical College

**Background:** Heart-failure (HF) is a leading cause of cardiovascular mortality. One of the risk factors of HF is myocardial-hypertrophy (MH). Cardiac sympathetic fibres originate from the left stellate ganglia (LSG) and have been linked to arrhythmias and HF.

**Aim and Objectives:** To study the effect of MH on LSG in a rat model with quantification.

**Materials and Method:** Rats were distributed randomly in two groups- control and isoproterenol. MH was induced in rats by isoproterenol intraperitoneal injections for 4 weeks. Echocardiography was done before & after 4 weeks. After completion of dosing rats were sacrificed and heart, neck and posterior thoracic wall with LSG were dissected out. Later, heart tissue from each group were stained and observed under microscope. Subsequently, using stereological estimation, volume of the ganglion, total number of neurons and area of the ganglion were calculated.

**Observations and Results:** 12 rats were included in the study with 6 in each group. In echocardiography we found that the thickness of interventricular septum and posterior wall of LV in isoproterenol group were significantly increased. We also confirmed the pathological changes (fibrosis in the subendocardial region) by histological examination of heart. We found that the overall volume of the LSG of the isoproterenol group rats was significantly more than that of the control group rats (p = 0.01).

**Conclusion:** Results show that MH affects the morphology of LSG, which may lead to its hyperinnervation and ultimately results in HF. Hence, in cases of cardiovascular diseases, blocking the sympathetic activity of SG may prevent the progression of HF.

112. **Plasticity of the retinal horizontal cells under light of variable photoperiods and intensities**

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**Background:** Retinal degenerative diseases like AMD are characterized by photoreceptor degeneration, followed by changes in the inner retinal neurons.

**Aims & Objectives:** To examine morphological and neurochemical modifications in horizontal cells (HC) after light induced retinal damage (LIRD).

**Methods:** Adult Sprague-Dawley rats (N= 30) were acclimated in 300 lux at 12 hour light: 12 hour dark (12L: 12D) photoperiod for 7 days and then exposed to 3000 lux at 12L: 12D, followed by exposure to constant light (24L: 0D) for 2 days. Rats were then brought to 12L: 12D and reared for 15 days in 300 lux. They were sacrificed at different days to see retinal HC remodeling. Calbindin D-28k (Calb) was localized by immunohistochemistry and their number counted in 280 µm length of inner nuclear layer (INL).
Result: Calb⁺ HC decreased in number with constant light but increased after light intensity was reversed (from 6 to 8/280µm length of INL, respectively; p<0.05), whereas abnormal Calb⁺ HC increased in number with constant light and decreased with light reversal. There was an increase in total number of Calb⁺ HC under constant light (13/280µm length of INL; p<0.05).

Conclusion: In response to LIRD, remodeling in HC soma and dendrites is induced. This plasticity is aimed to maintain the retinal circuitry. The increase in number of HC may be due to their inherent property to divide under stressful conditions.

113. Distance between sulci/gyri of temporal lobe and temporal horn of lateral ventricle with its side and gender comparison in human cadaveric brains

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Background: Medial Temporal Region [MTR] of the brain is difficult to access during neurosurgeries because of its location. Exposure of the temporal horn is an important step in these surgeries.

Aims and Objectives: To measure the distances of various sulci and gyri of the temporal lobe from the temporal horn of the lateral ventricle and their comparison between right and left hemispheres and between male and female cadaveric brains.

Methods: Fifteen formalin fixed human cadaveric brains [male- 8, female -7] were used for this study. Coronal section of the brain was taken at the level of inferior choroidal point. The distance from the various sulci and gyri of the temporal lobe to the temporal horn was measured using digital vernier callipers.

Results: No comparable differences were obtained between the values in our study and that of Western population on reviewing previous literature. In the present study, the distance between inferior temporal sulcus and temporal horn was more in males than in females. No other statistically significant differences were obtained on comparing male and female brains and left and right hemispheres in the present study.

Conclusion: Knowledge of the distance between the various temporal sulci/gyri and the temporal horn is necessary for planning approaches for surgeries in the medial temporal region.

114. Anatomical study of p1 segment of posterior cerebral artery in adult indian population

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Background: Human brain is a highly perfused organ of the body. Vasculature of brain is unique because it has a circular ring of arteries that anastomoses with each other to provide collateral circulation to brain. P1 segment of Posterior cerebral artery (PCA) takes part in formation of the arterial circle.

Aims and Objectives: To study the microsurgical anatomy including morphology and morphometry of P1 segment

Material and Methods: This study was done on 60 PCA obtained from 30 formalin fixed adult human brains which were procured from Dept. of Anatomy and Forensic Medicine (LHMC). With the help of eye loop and vernier’s callipers, the length and external diameter of P1 segment were measured. The data was tabulated and analysed statistically.

Result: The mean length of P1 segment of PCA was 5.48+-2.08 mm and the mean outer diameter at origin
was 2.75+/-0.88 mm and at the end was 2.6+/-0.93 mm.

Conclusion: Comprehensive knowledge of morphology and morphometric parameters of P1 segment of PCA can benefit the neurosurgeons and health care professionals in important medical implications.

115. A Study on the Footedness as Marker of Brain Lateralization and Its Relation with IQ

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Background: Human Brain exhibits unique characteristic known as laterality which indicates the preferential use of one side of the body while performing various tasks and is governed by the dominant brain hemisphere. Handedness is the commonly studied marker for assessing cerebral lateralization. However parameter viz. footedness also can serve as a marker but is rarely being explored.

Thus in this study an attempt was made to evaluate the human brain dominance based on foot preference and henceforth it’s correlated with IQ.

Materials and Methods: This study was carried out in the Department of Anatomy, Heritage Institute of medical Sciences, Varanasi with the inclusion of 600 participants. The participants were distributed age wise into 4 groups A, B, C, D (3-7, 8-11, 12-15, and 16-20 yrs)

Results: The left footed individuals had significantly (p<0.05) higher IQ levels than their right footed counterparts. However IQ was not significantly correlated with gender when compared with footedness. The results of IQ were analyzed as per predefined age groups but were found to be non significantly associated for genders within each groups.

Conclusion: Footedness can be used as one of the better indicators for human brain lateralization and IQ, as it is less affected by the existing societal and environmental factors.

116. Cadaveric Morphometry Of Corpus Callosum In Chhattisgarh

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Background: Morphometric parameters of corpus callosum (CC) have been observed as a useful guide during callosotomy, for various pathological conditions. Therefore, it is of great value to study the morphometry of corpus callosum and adjoining structures.

Aims and Objectives: To measure the dimensions of CC in cadavers of Chhattisgarh.

Methods: After procurement of 60 midsagittal-sectioned brains from Anatomy department, all the hemispheres were grouped according to side and labelled with a number. Various parameters of CC were evaluated using digital Vernier callipers, noted in MS-Excel sheet and analysed later.

Results: In CC of the right and left hemispheres, average length was 72.07mm and 71.84mm, straight distance between anterior and posterior surfaces of brain was 147.57mm and 148.53mm, distance between frontal and occipital poles was 152.86mm and 151.57mm, vertical distance between upper surface of hemisphere to superior border of mid-point of body of CC was 34.96mm and 38.10mm, distance between frontal pole to anterior-most point of CC was 28.69mm and 29.97mm, distance between occipital pole to posterior-most point
of CC was 50.73mm and 51.24mm, distance between anterior edge of genu to upper end of lamina terminalis was 28.31mm and 28.36mm, maximum width of genu was 11.14mm and 10.31mm, maximum width of splenium was 6.24mm and 6.79mm and width of mid-point of CC was 9.69mm and 10.19mm, respectively.

**Conclusion:** The various parameters of CC in cadavers in Chhattisgarh were established, for future reference and studies.

**117. Morphological variations and morphometry of Middle Cerebral Artery: A cadaveric study**

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Departement of Anatomy, KGMU, Lucknow

**Background:** Knowledge of anomalies in branching pattern of the middle cerebral artery (MCA) and variations in its length and diameter is of immense significance for surgical interventions. MCA's branching pattern influences the frequency of aneurysm and chances of stroke and reflects inter-population variations. There are only few cadaveric studies from India that have observed the morphometry and variations of MCA but none are from north India.

**Aims and objectives:** To study morphological variations and morphometry of MCA in the north Indian population and compare it with other studies.

**Methods:** We studied 42 middle cerebral arteries from 21 formalin-fixed brains. We observed the length of the M1-segment; outer-diameter at the site of origin; early branches; pattern of branching; anomalies of MCA and perforators of M1 and M2 segment.

**Results:** Mean length of M1-segment was 22.31±6.27mm (right) and 24.24±7.91 mm (left); outer-diameter was 3.10±0.48mm (right) and 2.94±0.59mm (left). We found duplication of MCA in 4.7% and accessory MCA in 7.14%. According to the branching pattern of M1-segment it was divided into three groups: Group I: bifurcation (72.72%), Group II: trifurcation (18.18%) and Group III: quadrifurcation (9.09%). Early branch from M1 was temporo-polar (34%), anterior-temporal (29.5%), orbito-frontal (20.45%) and posterior-temporal (15.9%). Proximal perforators from M1 segment were 3.47±1.8 distal 3.22±1.5 and perforators from M2-segment were 2.8±1.3.

**Conclusions:** Knowledge of variations in branching pattern will help in avoiding diagnostic pitfalls and the morphometry of MCA is key to successful thrombectomy.

**118. Behavioral and Biochemical alterations in cerebellum of rats exposed to Sodium Arsenite**

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**Background:** Arsenic, a naturally occurring toxic metalloid is ubiquitously found in the environment. Arsenic enters into the body through inhalation, oral exposure and dermal exposure and affects different regions of the body. Arsenic enters into the body through inhalation, dermal exposure and consumption of contaminated ground water and crosses the blood brain barrier and accumulates in brain and exerts neurotoxic effects. This study examined the neurotoxic effect of arsenic in cerebellum and also the motor changes and behavior changes in rats.

**Aim:** To find the effect of arsenic on Behavior, Motor and Biochemical parameters in rats

**Objectives:** To assess the behavior and motor activities and also the biochemical changes in arsenic induced
Methodology: Behavioral activities (Elevated Plus Maze and Open Field Test) and Motor activity (Beam Walking Test and Open field Test) were measured. Oxidative stress markers were analyzed by spectrophotometry.

Results: There is significant changes noted in locomotor activities, weight loss, rearing, grooming and also in freezing time, anxiety and in oxidative stress markers in exposed rats than control group.

Conclusion: Based on the present study and supporting literature clearly indicates that arsenic is toxic to animals and humans from biochemical and behavioral point of view.

119. Competency-based medical education: Implementation in basic sciences and an overview
Dr. Shaguphta T. Shaikh, Associate Professor, K.J.S.M.C, Mumbai

Medical education is undergoing a major paradigm shift to competency-based medical education. Competency-based medical education (CBME) is gaining impetus across the world. The Medical Council of India has described the basic competencies required by an Indian Medical Graduate and designed a competency-based module on integration of knowledge, attitudes, skills, and communication. While competency-based medical education is an evidence guided change in approach to curriculum and assessment, it is not immune to critique and concerns. CBME, hence, needs to be reviewed for its usefulness and limitations in the Indian context. The revised curriculum, aims to strengthen competencies in quantitative research methods, public health and preventive medicine, and health service organization and delivery, and understanding the societal needs. The implementation of CBME in an institute, in the context of basic sciences in general and anatomy in particular is discussed in this presentation. The promises and perils of CBME that need to be kept in mind to maximize its gains are described.

120. Perceptions of M.B.B.S. Students Towards the Digitalization of Perceptions of M.B.B.S. Students Towards the Digitalization of Anatomy Education: A Cross-sectional Study in a Medical College of New Delhi
Shilpa Bathla, Sneh Agarwal, Tarana
Lady Hardinge Medical College, New Delhi

Background: The COVID-19 pandemic necessitated an unprecedented and sudden digital switch-over in medical education worldwide, teaching and learning Anatomy being no exception. Appraisal of medical students’ perspective towards this inevitable change is extremely beneficial for efficient delivery and a further improvement in Anatomy e-learning.

Aims & Objectives: To analyze the experiences, benefits and challenges perceived by the Phase-I M.B.B.S. students regarding the digitalization in teaching and learning of Anatomy in the wake of COVID-19 crisis.

Methods: This cross-sectional study was conducted by the department of Anatomy. A self-designed questionnaire validated by subject experts was circulated among the Phase-I M.B.B.S. students (2019-20 batch) via google forms. Voluntary responses collected after mandatory written informed consent were entered in Microsoft excel sheet and subjected to appropriate statistical analysis.

Results: A response rate of 70.83 % was noted with 170 responses recorded out of a total roll call of 240. Majority (80 %) of the students appreciated replacing regular didactic lectures with interactive online theory classes. 3-D Apps based learning (54.1 %) was preferred over online streaming of practical classes (17.6 %). Offline conduction of Histology practicals after re-opening of college was requested by 45.3 % of the lot.
Conclusion: This study highlighted the students’ preferences as well as the difficulties faced by them with respect to digitalization in Anatomy education. We conclude that an integrated pedagogy model combining both traditional and online approaches looks promising even in the post COVID-19 learning era.

121. Short protocol plastination of upper limb specimens- To study cross-sectional anatomy with corresponding CT – films.

Dr. Shivani Garoda, Dr. Sushma Kushal Kataria

Background: Present study was aimed to find out suitable long-lasting preservation technique to preserve upper limb cross-sections specimens and compare it with their corresponding CT – films and used for teaching aid.

Aims and Objectives: To find the learning outcomes of study and control group of first year medical students by comparing plastinated cross-sections of arm with their corresponding CT-films.

Material and Method: 100 first year medical students were selected as per inclusion and exclusion criteria and were divided into two groups, control and study by simple block randomization technique. Teaching session was given to both the study groups with the help of plastinated cross-section of arm along with CT-films. Practical assessment was conducted to find out how much they had learned and data was collected and analyzed.

Result: After analyzing it was found increase in mean marks from control to study group, revels plastinated cross-section act as better tool in teaching cross-sectional anatomy in relation to CT-films. Students of study group have shown better understanding and obtain more marks in examination.

Conclusion: Plastinated cross-section specimens improve the quality and learning cross-sectional anatomy. In this study we found a good overall correlation between plastinated specimens and CT.

122. Usefulness and Challenges of Medical Students towards ‘Image based OSPE’ for Assessing Practical Anatomy during a Pandemic

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Background: Practical examination in Anatomy employs ‘OSPE-Objective Structured Practical Examination’ as a part of assessment in real-time. It includes a stream of prosections with structures pinned or tied in pre dissected specimens. It also includes histological slides, embryological models and radiological films. However, things have changes due to the COVID pandemic. Therefore, we at the department of Anatomy attempted an ‘Image based OSPE’ assessment.

Aims and Objectives: The study aims to showcase our experiences in conducting the image based OSPE and the students’ attitude towards it.

Methods: ‘Image based OSPE was conducted for 250 first-year medical undergraduate students. Images of dissected specimens, histology slides, embryological models and radiographic films were used. The structures to be identified was marked by pointers and relevant questions were tagged to it. Students’ perception regarding the session was assessed using a semi structured questionnaire. Responses were recorded and the quantitative data was expressed in percentage. The qualitative data was subjected to thematic analysis.

Results: Majority of the students stated that the conduct of image based OSPE was smooth (80%). When asked whether, it is a convenient alternative for specimenslide-based (real-time) OSPE, 47 % agreed and 37%
disagreed. Thematic analysis of qualitative data identified two themes: usefulness of the session and difficulties/challenges encountered.

Conclusions: Conduction of ‘Image based OSPE’ for assessing practical Anatomy during a Pandemic was a good move as indicated by the students. It could be an effective alternative provided the technical issues such as virtual hindrances and impaired logistics are taken into consideration.

123. Perception of phase-I medical students towards online teaching during COVID-19 pandemic-An Institutional study

Sultana Dr. Zafar, Associate Professor Of Anatomy, Deccan College Of Medical Sciences, Hyderabad, Telangana, India.

Background: During current pandemic online teaching evolved quickly to fill the void created in medical teaching by the lockdown. A new normal has to be set up with respect to medical education.

Aims and objectives: 1. to understand student perspective about online classes; 2. to assess the preparedness for blended learning in future

Methods: The self designed questionnaire as Google form was sent to phase-I students of Deccan college of medical sciences, Hyderabad via WhatsApp with informed consent.

Results: Out of 150 students of phase-I, 128 responded to all questions. 103 [80.5%] students responded as they have not participated in any type of E-learning before this pandemic. 91 students 71.1% were attending classes with their smart phones. Main Advantages of online classes accepted by students were ability to stay at home 84 students [65.5%] and comfortable surroundings. Main disadvantages were poor network connections and family distractions and lack of suitable devices. 82.8 %, 106 students opted for physical classes are better than online mode. 104 students responded as they are not having any idea about blended learning.

Conclusions: The success of online teaching in a developing country depends on various factors like administrative planning, technical support, instructional planning and execution of classes, and feasible high-speed internet connection. Knowledge of student’s perspectives could help develop medical school curricula in future.

124. Soft Embalming of Cadavers for Training Purposes: Our Experience

Prajakta Kishve

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Background: Surgical and anatomical training has been found to be most optimally simulated in a cadaver than any other available methods. The widely accepted soft embalming techniques makes the cadaver soft and more lifelike and better suited for training unlike with traditional embalming by formalin.

Aims & Objectives: The aim is to evolve new methods of soft embalming which provide better cadavers for surgical training. Objective is to provide long term preservation of tissues, viscera and body for cadaveric workshops.

Materials & Methods: The study was carried out in department of Anatomy, ESIC Medical College, Hyderabad. The cadavers were embalmed with readymade embalming fluid obtained from Genelyn Pvt Ltd. of Span Surgical Co. Coimbatore. The cadavers were preserved at 4 °C. These cadavers then used for hands on training workshop of flap dissection course by department of Plastic surgery and for Knee arthroplasty & arthroscopy workshop. We have conducted the workshops in two sessions in one year. Five-point Likert scale
questionnaire was used with criteria of measurements like skin colour, consistency, odour, differentiation of the layers.

**Result:** The participants expressed satisfaction on cadaver quality on their utility for performance of surgical procedures. They expressed that joint mobility was good, the consistency was soft and differentiation of layers was good.

**Conclusion:** The soft embalmed cadavers retain their organoleptic properties and hence facilitates surgical skill training.

125. “Students’ Perception of Online Anatomy Classes Compared to Traditional Classroom Teaching during COVID-19 Pandemic: An Institutional Study”

**Rashmi Malhotra, Pooja Bhadoria, Brijendra Singh,** Department of Anatomy, AIIMS, Rishikesh

**Background:** Sudden outbreak of COVID-19 pandemic led to suspension of regular classes and created restlessness, anxiety and uncertainty among the students regarding their studies and training. To ensure continuation of teaching-learning process, e-learning through online classes was initiated. After six months of this mode of teaching, a feedback from students was taken so as to know their perception about this mode and compare it with traditional classroom teaching.

**Aim and Objectives:** The aim of the study was to know the students’ perception of online anatomy teaching on their learning of Anatomy, as compared to traditional classroom teaching.

**Methods:** It was a cross sectional study, sample size consisted of 100MBBS first year students plus seven post graduate anatomy students. A set of self-designed questionnaire validated by five experts was provided to the students. Descriptive statistical tests were applied to calculate percentage, frequency and proportion of responses from students. Data derived from Likert scale was used to derive mean and standard deviation.

**Results:** Students gave a mixed response regarding online and traditional classroom teaching. In some aspects online teaching was appreciated in regards to time management, finishing the syllabus in stipulated time and accessibility to study material. Traditional classroom teaching showed a better response in terms of imparting basic concepts of Anatomy and Student teacher interaction. Students were of the view that practical aspect of anatomy learning could not be replaced with online or digital mode.

**Conclusion:** The results of the study suggest ideas that would help in implementation of new tools and modalities of teaching and learning.

126. Issues, challenges and solutions related to Anatomy teaching and research after lockdown among Anatomy faculties in Gujrat state of India

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**Background:** The COVID 19 lockdown in India came into effect in later half of March 2020. The physical classes which included dissections, practical, theory, demonstrations, tutorials etc. were cancelled due to lockdown and the teaching was purely virtual. These included virtual platforms like google meet, Microsoft teams, gotomeetingetc, video demonstrations, audio ppt, electronic and telephonic communication among students and faculties. The branch of anatomy which deals primarily with human cadaveric dissections and body parts is bit difficult to learn as well as teach on a virtual platform. However the faculties made full efforts to minimise the gaps in teaching and learning in spite of being busy with household chores and other work.
Hence a study was conducted among faculty members of Gujrat India with the aims mentioned below.

**Aims and Objectives:** To find out the Major challenges in anatomy teaching and research during the phases of lockdownTo offer solutions based on the study results

**Methods:** It is a cross sectional questionnaire based study, google forms circulated, among faculties of Govt. and private Medical colleges of Gujrat (sampling frame). 30 faculties willing to participate in the study will be randomly chosen. Taking 20% non-response rate an extra sample would be added if needed. Ethical clearance will be taken from parent institute (Data was collected from 1st Feb 2021 up till 22nd Feb 2021. The data will be analysed till 25th Feb 2021.

**Results & Conclusions-** will be presented at the conference

**127. Variant course and termination of brachial artery – a cadaveric study**

**Hemamalini, Vinutha SP**
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**Background:** Brachial artery, a continuation of axillary artery, from the inferior border of tendon of teres major to neck of the radius, terminates into radial and ulnar arteries just a cm distal to the elbow joint. Unlike veins, variations in the arteries are less frequent. According to Poynter, major variations involving the brachial artery are seen in 25% of cases based on the development of arteries of upper limb. The knowledge of these variations is important for catheterization, graft harvesting, vascular shunt application.

**Aim and Objectives:** To observe the variations in the origin, course and termination of brachial artery

**Materials and Methods:** The present study was conducted on 20 upper limbs in the department of Anatomy of JSS Medical College, Mysuru. The brachial artery was traced and branching pattern was noted and photographed.

**Results:** In the present study, normal pattern of brachial artery course, branching pattern was observed in 14 specimens. Remaining 6 specimens showed variant course and branching pattern in the brachial artery like highly tortuous brachial artery, superficial brachial artery with tortuous course, superficial brachio-ulnar artery and brachio-radial artery.

**Conclusion:** Knowledge of vascular pattern of upper limbs especially their variations in their origin, course and branching pattern is of utmost importance clinically to physicians, interventional cardiologist, radiologist and orthopedic surgeons due to the advanced surgical procedures practiced in vascular surgeries, plastic (reconstructive) surgeries and also for diagnostic and therapeutic approaches.

**128. Os Fabella of knee: A Cadaveric study**

**Meghana Joshi¹, Vasant Vaniya¹, Mitesh Dave²**
Department of Anatomy Government Medical College Baroda, Gujarat

**Background:** Fabella is a sesamoid bone of knee develops in the tendon of lateral head of gastrocnemius muscle.

**Aims and Objectives:** The present study was aimed to observe and analyze the prevalence of fabella, in gender and symmetrical presentation in cadavers.

**Methods:** For present study ninety (45 right and 45 left) knee joints were dissected from the formalin fixed embalmed cadavers. In the posterolateral aspect of knee joint under the tendon of lateral head of gastrocnemius muscle, presence of fabella was observed & analyzed among gender, size of fabella was measured by digital Vernier caliper and obtained data were analyzed statistically.
**Results:** Fabella was found in twenty four Lower limb, showed total prevalence of 26.66%, on right side 15.55% (14 out of 45) and on left side 11.11% (10 out of 45). Bilateral presentation was found in 16 knees (17.77%) and unilaterally in 8 knees (8.88%). Prevalence in female and male was found in seven knees (7.77%) and seventeen knees (18.88%) respectively. Mean length and breadth of fabella was 19.22mm & 12.95mm respectively.

**Conclusions:** Present study suggested prevalence of fabella was more common with usual bilateral presentation, more seen on right sided knee. Lack of knowledge about fabella bone may be missed as loose bodies in diagnosis both clinically and radiologically and therefore study is of great importance clinically to the orthopedic surgeon for differential diagnosis in knee pain and also to the radiologist and anthropologist to understand evolutionary changes in knee joint.

129. **Morphological and morphometric study of foramen magnum in dry skulls and its clinical significance.**

**Dr. Vihangi A. Parekh¹, Dr. Dipali J. Trivedi², Dr. Sucheta M. Chaudhary³**

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**Background:** Foramen magnum is an opening in the occipital bone at the base of skull. Structures passing through it are lower end of medulla oblongata, vertebral arteries and spinal accessory nerves.

**Aims and Objectives:** To observe shapes of foramen magnum and to measure various morphometric parameters.

**Materials and Method:** Morphological and morphometric study was done on 65 dry human skulls. Digital Vernier calipers were used for measurement. Different shapes of foramen magnum were noted and classified as oval, round, tetragonal, pentagonal, hexagonal and irregular. Morphometric measurements like anteroposterior diameter, transverse diameter were measured and foramen magnum index was calculated. Statistical analysis was done and minimum, maximum, mean and standard deviation were calculated.

**Result:** The most common shape of foramen magnum was oval in 31(47.69%), followed by round in 12(18.46%), pentagonal in 8(12.3%), tetragonal in 7(10.76%), hexagonal in 5(7.69%) and irregular in 2(3.07%) skulls. The mean anteroposterior diameter was 35.16±2.98mm, transverse diameter was 30.02±2.31mm and foramen magnum index was 1.17±1.2.

**Conclusion:** This study will be clinically significant to neurosurgeons in cranio-vertebral surgical approches and in posterior cranial fossa surgeries. Data of present study will be helpful to anthropologists, anatomist and forensic investigators.

130. **A Study of origin, termination and variations of the right coronary artery in the human cadaveric heart western Rajasthan population.**

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Department of Anatomy, Dr.S.N.Medical College, Jodhpur, India

**Background:** The word coronary is derived from the latin word co-ro-ne, latin ko ro ne, means anything hooked and coronary means ‘encircling in a manner of crown’. The right coronary artery arises from the anterior aortic sinus of the ascending aorta.

**Aims and Objectives:** The present study was conducted to observe the anatomical variations of the right coronary artery.
Methods: The present study was conducted in Department of Anatomy Dr. S. N. Medical College Jodhpur, Rajasthan, to observe the origin, termination and variations of the right coronary artery in human cadaveric heart. Study includes 50 adult human cadaveric hearts.

Results: In 38 (76%) hearts out of 50, the origin of the right coronary artery was from the right aortic sinus, whereas, in 12 (24%) hearts, its origin was from the posterior left aortic sinus. In 10 (20%) hearts out of 50, the termination of the right coronary artery was between acute margin and crux of the heart. In 15 (30%) out of 50, it terminated at the posterior interventricular septum. Whereas, most commonly in 23 (46%) cases, it was terminated between crux and obtuse margin of the heart. In 4% of heart, it was terminated.

Conclusions: A proper knowledge of anatomy of coronary arteries is a successful clinical outcome treatment of coronary artery disease.

131. Morphological variations of fissures and hilar structures of lungs and their surgical significance

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Background: The fissures of lungs are important during respiratory movements of lobes and help in uniform expansion of the whole lungs. The pulmonary hilar morphology of the arrangement of the structures is extremely variable. Knowledge of such variation may be important for performing lobectomies, surgical resections.

Aims and Objectives: The aim was to study the anatomical variations of the fissures of lung and structures at the hilum of the lung.

Methods: Fifty pairs of lungs from formalin-fixed cadavers (Total of 100 specimens) were studied for fissure of lungs and variations in arrangement of structures at the hilum and the observed and photographed.

Results: Horizontal fissure was absent in 14% and incomplete in 32% while oblique fissure was absent in 4% cases and incomplete in 42% cases of right lungs. The oblique fissure was absent in 8% cases and incomplete in 46% cases of left lungs. The hilum of right lungs showed three, two and one artery in 4%, 68% and 28% cases respectively. The percentage of two, three and more than three veins were 66%, 30% and 4% respectively while two and three bronchi in the right lungs were seen in 96% and 4% cases respectively. The percentage of two and one artery in left lungs was 6% and 94% respectively while that of two and three veins in left lungs was 84% and 16% respectively. 22% of left lungs had 2 bronchi and 78% had only one bronchus in the hilum.

Conclusions: The present study will provide the database for variations in the morphology of lungs which are clinically relevant and important for Cardiothoracic surgeons, radiologists for interpreting x-rays, CT scans and MRI.

132. A Morphometric Study of the Human Malleus

Sanjay Prasad Sah¹, Naresh Chandra Goel².

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Background: Malleus is one of the three ear ossicles which is the largest among all. It is present in the middle ear cavity and are responsible for the conduction of sound waves from external to inner ear. The malleus has a head, neck, manubrium and anterior and lateral processes.
Aims: To study the morphometry of human malleus and to determine the normal range of the various measurements of malleus.

Objectives: 1. To compare the morphometric data of malleus of Right and Left sides.

Methods: A total of 120 dry adult human mallei were used in this study. Mallei bones were collected during the routine dissection of cadavers by the MBBS students of first professional in the dissection hall of Anatomy Department of various medical colleges of Uttar Pradesh. These dimensions of malleus bone were taken with the help of digital Vernier calliper which has an accuracy of 0.01 mm. The weights of the malleus bone were taken by the electronic micro-balance of ‘Sartorius CP224S’ model with least count of 0.01 mg.

Results: Mean value of total length of malleus was found to be 7.915 mm and mean value of length of handle was 4.74 mm. The mean of weight of malleus was 23.435 mg.

Conclusions: No statistical significant difference was found when compared with the morphometric parameters of Malleus of right and left side.

133. Morphometric Study of Distal End of Femur in the Population of Central India : Comparison with Other Ethnic Groups and it’s Clinical Implication in Knee Joint Prostheses

Dr Awantika Thakur, L N Medical college, Bhopal

Background: Total knee arthroplasty is a complex and precise operation aimed at alleviating pain and improving the functional stability of knee joint. Commercially available TKA implants do not cater to anthropometric differences observed across different ethnicities which leads to the problem of an implant size mismatch with the resected bony surface in the Asian patients.

Aims & objectives: To measure, tabulate and analyze various parameters of the distal end of femur and compare the data with different Indian populations and other ethnic groups by various researchers to provide morphometric data of distal end of femur.

Methods: 250 human adult dry femora bone of unknown age and sex were taken. Bicondylar width, maximum anteroposterior distance of lateral and medial femoral condyle, maximum transverse distance of lateral and medial femoral condyle, intercondylar Notch Width were noted using digital vernier calipers.

Results: The mean bicondylar width for the right and left sides were 65.82±4.80 & 66.21±4.43 mm respectively. The mean antero-posterior distance of medial and lateral condyle of right femur were 55.58±4.15 & 56.52±4.18 mm. The mean antero-posterior distance of medial and lateral condyle of left femur were 55.80±3.77 & 56.49±3.69 mm. The mean transverse diameter of medial and lateral condyle of right femur were 21.82±2.44 & 26.07±2.64 mm. The mean transverse diameter of medial and lateral condyle of left side were 22.09±2.15 & 26.16±2.33 mm. In this study there were no statistically significant parameters between right and left femur.

Conclusion: The study provides the morphometric data of distal end of femur in Indian population of Central India region by direct method which would be useful to design the knee replacement prosthesis for Indian patients to reduce post-operative complications after TKA.

134. Morphometry of minor musculocutaneous perforators of Gracilis muscle: A cadaveric dye injection study

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**Plastic Surgery, King George’s Medical University UP, Lucknow**

**Background:** Gracilis muscle is being widely used as myocutaneous flap because it is easy to harvest, aesthetically suited to the patients and has low morbidity. There are several morphometric studies conducted on perforators of Gracilis but most of them have focused upon major perforators. Very little knowledge is documented about minor perforators of Gracilis. Considering the above-mentioned lacunae and wide range of use of Gracilis as flap the present study was designed.

**Aims and Objectives:** To identify the source and study the morphometry of minor musculocutaneous perforators of Gracilis throughout the muscle length.

**Material and Method:** 6 fresh and 6 embalmed adult cadavers of both the sexes were dissected following injection of colored latex in the femoral artery and minor musculocutaneous perforators of Gracilis were observed.

**Results:** 3-5 minor musculocutaneous perforators were found in each Gracilis muscle. Majority of minor perforators originated from superficial femoral artery (49.5%) followed by profunda femoris artery (25.3%) then medial circumflex femoral artery (21.9%) and femoral artery (3.3%). Distance of point of origin of minor perforator from pubic tubercle in males were significantly higher as compared to females in the upper one-third (85.26±25.80 mm and 61.86±24.50 mm respectively) as well as in lower two-third (212.72±45.04 mm and 182.14±41.07 mm respectively).

**Conclusion:** 3-5 minor musculocutaneous perforators were found in each Gracilis, this knowledge would help the surgeons in deriving Gracilis flap based on these minor perforators.
1. Facio-lingual trunk: a case report

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**Background:** The common carotid arteries provide the major source of blood to the head and neck. The right common carotid artery originates from the brachiocephalic trunk in the neck while the left arises in the thorax from the aortic arch. Normally, it gives two terminal branches, external and internal carotid arteries at the level of superior border of thyroid cartilage in carotid triangle. The anatomic understanding of the facial and lingual artery is thus necessary since most of the cosmetic surgeries take place in the Head and Neck region.

**Case Description:** During routine dissection in Anatomy Department in R.N.T Medical College, Udaipur, variation in the origin of facial and lingual artery from external carotid on left side was observed in a male cadaver. The lingual artery and facial artery were originating on left side as the common facio-lingual trunk from the anterior side of external carotid artery.

**Conclusions:** The variations in the branching pattern of external carotid artery are rare findings providing knowledge useful for surgeons operating on face and neck regions, for radiologists in the interpretation of imaging. The present case thus would provide useful information for clinical applications since most of the cosmetic surgeries take place in head and neck regions.

2. High bifurcation of brachial artery - A case report

**Dr. Goswami Prashant Giri (Resident), Dr. Seema Prakash (Sr. Professor)**

R.N.T Medical College, Udaipur (Rajasthan)

**Introduction:** Brachial artery is the continuation of axillary artery beyond the lower border of teres major muscles, opposite the neck of radius in the anterior cubital region it divides into radial and ulnar arteries.

**Case Report:** During routine dissection in department of anatomy R.N.T medical college Udaipur, unilateral high bifurcation of brachial artery was found in right upper limb of an old male cadaver 2 cm below lower border of teres major muscles.

**Conclusion:** Variations in origin and course of principal arteries have practical importance for orthopaedicians, radiologists and surgeons. So awareness is necessary to avoid pre-operative complications in upper limb.
3. Surface variations of the liver and their clinical implications.
Kruti Bhardwaj¹, Dr. Chandrakala Agarwal², Dr. Dhiraj Saxena³

Background: The liver is the largest of the abdominal viscera; it occupies most of the right hypochondrium and epigastrium, and extends into the left hypochondrium as far as the left lateral line. The liver has four lobes or eight segments, depending on whether it is defined by its gross anatomical appearance or by its internal architecture. Studies on the variations in segmental anatomy of the liver are extensive, but very few studies have dealt with the surface variations of the liver.

The knowledge of variant anatomy of the liver can be fruitfully utilised by anatomists, radiologists and surgeons respectively for academic interest, to avoid possible errors in interpretation and subsequent misdiagnosis, and to assist in planning appropriate surgical approach that is crucial for determining the patient outcome.

Aim - To study the variations on the surface of the liver and their clinical implications.

Objectives:
1. To find presence or absence of lobes and presence of any accessory lobes.
2. To find variation in shape of liver lobes and in contour of borders.

Methodology & Result: In the form of flow chart.

Conclusions: The study revealed that the variations on the surface of liver were common. This study highlights the frequent occurrence of morphological variations on the liver surface. These findings can be utilised by imaging specialists & surgeons to avoid possible errors in interpretation and subsequent misdiagnosis and to assist in planning appropriate surgical approaches.

4. Unilateral absence of round ligament of femur – a rare cadaveric case report
Divya Umamaheswaran, Naga Jyothi, Rema Devi

Background: Round ligament of femur is pyramidal structure with apex attached to the fovea of the femur head and its base blends with the transverse acetabular ligament. It is an intracapsular but extrasynovial structure. It is also called as ligamentum teres femoris or foveal ligament. It transmits the acetabular branch of obturator artery and also acts as a secondary stabilizer of the hip joint by supplementing the other ligaments of hip joint in extreme range of motion. Absence of Round ligament of femur is a rare variation which can be unilateral or bilateral and prevalence is 2-3%. It presents rarely as isolated entity or in association with congenital dysplasia of hip.

Methods/Case Description: We present a case report with a rare variation of unilateral absence of round ligament of femur. During routine dissection of a middle-aged cadaver, the left lower limb was found to be laterally rotated. On opening the hip joint cavity, the round ligament of femur was absent, acetabular labrum and femoral head was normal. On the right side, lower limb was normal in position and round ligament of femur was present in normal length and thickness.

Conclusion: Awareness and knowledge of such a rare variation is important for Radiologists and Orthopedicians for better diagnosis and management of hip related problems.

5. A unilateral double head of origin of flexor digitorum accessorius longus - a case report
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Background: In the ankle region, accessory muscle incidence was not uncommon; those are peroneus quartus
(most common), flexor digitorum accessories longus, tibiocalcaneus internus, peroneocalcaneus internus and accessory Soleus. The Flexor Digitorum Accessories Longus (FDAL) was the second most common accessory muscle present in the ankle region of about 4% to 8%.

**Case Description:** During the routine dissection of the ankle region, we observed the unusual muscle belly, flexor digitorum accessories longus covering the deep flexor tendons and neuro-vascular bundle underneath the flexor retinaculum of the left leg. It has two head of origin, which was the medial and lateral head. The medial head takes origin from the lower part of the tibia's medial border. The lateral head takes origin from the lower part of the calcaneum's medial surface. In the tarsal tunnel, it enters as muscle belly, then they both head get merged and exit as tendons. It gets inserted into the tendon of the flexor digitorum longus at the junction of the insertion of flexor digitorum accessories.

**Conclusion:** A better understanding of the detailed anatomy of Flexor Digitorum Accessories longus and its relation to the tarsal tunnel will give insight for differential diagnosis for causation of tarsal tunnel syndrome. The knowledge of these accessory muscles locations in the ankle was of immense significance during the foot and ankle surgery.

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**6. Ossified thyroid cartilage- A Case report**

**Janpreet Singh Kala, Aseem Tandon**

Dept. of Anatomy, Armed Forces Medical College, Pune

**Introduction:** The three major cartilages of the larynx - thyroid, cricoid, and arytenoids are all hyaline cartilages. They may undergo calcification or endochondral ossification (or both). Such calcified or ossified cartilages may compress the neurovascular structures in the vicinity. A fully ossified thyroid cartilage is rarely found and mostly seen in males as compared to females.

**Method:** During the routine dissection of 30 cadavers the case was seen in one male cadaver in the Department of Anatomy, Armed Forces Medical College Pune.

**Observation:** A completely ossified thyroid cartilage in one cadaver was observed.

**Discussion & Conclusion:** Disordered ossification or calcification of ligaments or cartilages may compress neurovascular structures and can cause serious implications during surgical intervention in the region, and may lead to false neurological differential diagnosis. Ossification normally starts in both sexes at the posterior border, the lower margin, and the inferior horn of the thyroid cartilage. The male thyroid cartilages ossified in most of its parts around the age of 70 years, but the female cartilage never ossifies completely, leaving the ventral half cartilaginous. Ossified thyroid cartilages may compress the neurovascular structures in the vicinity. Ossified thyroid cartilages found in this study may lead to internal or external laryngeal nerve palsy or compression. External laryngeal compression or palsy will result in voice changes ranging from slight huskiness and inability to reach a high pitch. Internallaryngeal compression or palsy will result in loss of laryngeal cough reflex, and, in turn, increase the risk of aspiration pneumonia.

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**7. A Novel Variation of Anterior belly of Digastric Muscle: A case Report**

**Dr. Sushma Daripelli¹, Dr. Satya Prasad.V²**

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**Background:** The digastric muscle consists of the anterior and posterior belly joining the mandible, hyoid bone and temporal bone. The anterior belly of digastric may present significant variations of substantial
surgical importance in head and neck region.

**Case Description:** During routine dissection of teaching for phase I undergraduate medical students at AIIMS Bibinagar, we found a variation with anterior belly of digastric muscle, the variant muscle belly had origin from right digastric fossa and crosses contralaterally superficial to mylohyoid muscle; and inserted to the left anterior digastric belly as well as merging with the intermediate tendon.

**Conclusion:** Anterior belly of digastric variations have shown to have impact on anatomists, radiologists and surgeons. The present variation is unique and knowledge of the same will be helpful to clinicians and oral surgeons. This is a novel variation which has not been described in the literature to the best of our knowledge.

8. **A Rare Anatomical Variation of Musculocutaneous Nerve**

**Dr. Kumari Soni**

**Introduction:** Musculocutaneous nerve (MCN) is one of the terminal branch of lateral cord of Brachial plexus, responsible for innervation of flexor musculature of elbow and skin sensitivity on Lateral surface of forearm. It arises from lateral cord in axilla, run downward, penetrate Coracobrachialis and passes obliquely between Bicep brachii and Brachialis and supplying them. It appear at lateral margin of bicep tendon and pierces the deep fascia just above the elbow. It runs down the lateral aspect of forearm as lateral cutaneous nerve of forearm.

**Aims and Objective:** Knowledge of variation of MCN is clinically important for Anatomists, Orthopedics, Neurologists, Surgeons and anesthetists to avoid unexpected complications.

**Material and Method:** A detailed study was carried out on 20 upper limbs by using 10 embalmed cadavers in Department of Anatomy, PMCH. Pectoral region, axilla, arms, cords and branches of brachial plexus were dissected. The origin, branching, relation and variation of MCN in were noted.

**Result:** Bilateral absence of MCN was noted in one male cadaver and area of innervation of MCN was supplied by median nerve.

**Conclusion:** The anatomical variation described here has practical implication since injury to median nerve in this case have caused unexpected paralysis and hypoaesthesia of lateral surface of forearm, in addition to clinical sign of Median nerve injury.

9. **Morphometry of Gastrocnemius muscle for flap design**

**Amber Rana¹Amber Irfan², RK Diwan³, Jyoti Chopra⁴ Sushma Tomar⁵, Brijesh Mishra⁶**

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**Background:** Gastrocnemius muscle is of a significant importance in covering large tissue defects, is easy to harvest as it is located superficially in the posterior compartment of the leg. According to Mathes and Nhai classification, Gastrocnemius falls under Type I i.e muscle having one dominant vascular pedicle.

**Aims and Objectives:** To take the morphometric measurement of Gastrocnemius muscle.

**Material and Method:** 6 fresh and 6 embalmed adult cadavers of both the sexes were dissected from the origin to insertion of the muscle.

**Results:** The mean length of muscle belly in males (167.86 ± 7.40) was significantly more than females (136.70 ± 12.67 mm). The breadth of the muscle belly at its widest part in males (81.57 ± 4.01 mm) was
significantly more than females (71.09± 2.38mm). Mean length of tendon in males (170.36±5.94 mm) was significantly more than female (146.40±19.22 mm). The breadth of the tendon in males (57.29 ± 4.43 mm) was more significantly than females (48.20±5.35 mm). The total length of the muscle in males (338.21 ± 12.14mm) was more significantly than female (283.10 ± 31.05 mm). Belly to tendon ratio in males (0.94±0.06) was significantly more than females (0.94±0.06). The ratio of the length of muscle belly to the breadth of muscle belly in males (2.06± 0.09) was significantly more than females. (1.91±0.22).

**Conclusion:** All the cadavers showed two heads of gastrocnemius muscle i.e a medial head and a lateral head. All the morphometric measurements of the gastrocnemius muscle and tendon were significantly more in males than in females.

10. **Fusion anomaly in thoracic and lumbar vertebrae: A case report**

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Department of anatomy, King George’s Medical University, U.P Lucknow

**Introduction:** The Fusion anomaly at thoracic and lumbar region may be congenital or acquired. It causes back pain and neurological symptoms. The vertebral column is formed from the sclerotomes of somites during third week of intrauterine life. The anomaly of these regions are of interest of anatomist, orthopaedician, neurologist, neurosurgeon and radiologists.

**Aims and Objective:** During routine survey of the osteology lab of the anatomy department we found a rare case of fusion anomaly between thoracic and lumbar vertebrae. Knowledge of fused vertebrae is used in surgical procedures and medical practice. Therefore, the present study was done to determine these types of fusion anomaly.

**Material and Methods:** An interesting and rare case of fusion anomaly of all lumbar vertebrae along with the lower 10 thoracic vertebrae was observed during routine survey in the osteology lab of department of anatomy King George’s Medical University Lucknow, UP, India.

**Results:** In the present study, we found fusion in 10(83.33%) thoracic vertebrae, 5(100%) in lumbar vertebrae. Superior and inferior articular facets of all vertebrae were fused together. Body of all vertebrae were fused together along with intervertebral disc. Ligamentum flavum between vertebrae were ossified. The interspinous ligament in middle segment of thoracic vertebrae was also ossified.

**Conclusion:** With the present study we can conclude any alteration from normal anatomy of vertebral column can affect various system of body as major or minor complication. The precise knowledge of this type of anomaly is important for preventing any serious damage by early diagnosis and treatment.

11. **Accessory leaflets of atrioventricular valves: a morphometric study**

**Adya Priyadarshini1, Anita Rani2, Jyoti Chopra3, Anoop Verma4**

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**Background:** Conventionally, right atrioventricular valve (RAVV) is described as tricuspid and left atrioventricular valve (LAVV) as bicuspid. But sometimes, the number of leaflets may exceed in both LAVV and RAVV and are known as accessory cusps. This study gives an overview about variations in the number of cusps. As the literature suggests that the valvular heart diseases are very common, the knowledge about number of cusps will help in the surgical procedures like valve replacement or valvoplasty.
Aims and Objectives: To determine the variation in the number of cusps in LAVV and RAVV.

Methods: The study was carried out on 100 formalin fixed hearts regardless of sex. Dissection was performed according to standard techniques. Number of cusps were observed in atrioventricular valves.

Results: In case of RAVV, tricuspid valve was found in 85% of hearts, and rest showed accessory cusps varying from 4 to 5 in number. In LAVV, 2 cusps were seen in 96% of hearts whereas 4% of hearts showed 3 cusps.

Conclusion: The data would be of immense help in designing prosthetic heart valves and in surgical procedures like valvuloplasty.

12. Unusual variation in renal artery – a case report

Dr Deepu Singh Kataria

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Introduction: The renal arteries arises from the lateral side of aorta below the origin of superior mesenteric artery at the level of L2 vertebra. The right renal artery is longer then left renal artery.

Case Report: During routine practical session of male cadaver aged 55 year, the renal artery of both sides showed variation in the branching pattern. On right side, three renal arteries were arise at different level from the abdominal aorta. The upper renal artery was arise just below the superior mesenteric artery. The middle renal artery was arise at the level of L2 vertebra. The lower artery was arises at the level of L3 vertebra 1.2 cm below the origin of inferior mesenteric artery.

On the left side the renal artery was arise from the normal level behind the left renal vein and divides into anterior & posterior trunks. Anterior trunk enter in the substance of kidney through the hilum. Posterior trunk supplies the posterior segment of kidney. The relation of hilum of left kidney were (before backward) - anterior trunk of renal artery, renal vein, posterior trunk of renal artery and ureter.

Conclusion: Variations of renal vessels are more significant due to gradual increase in interventional radiological procedures, renal transplantation, and vascular surgeries. Knowledge of presence of multiple renal arteries can prevent various complications during and after surgical procedures.

13. Unilateral alar thoracic artery: A case report

Dr. Kalpana Gehlot, Dr. Sushma K. Kataria

Background: Upper limb arteries shows many variations in its course or its branching at various levels may be at axilla, arm, forearm and hand. Axillary artery, main artery of axilla shows various variation in its branching pattern. Presence of one rare variant namely alar thoracic artery, interfere with surgical access diagnostic interventions.

Method: 48 embalmed cadaveric axilla and upper limb were dissected in the department of anatomy, Dr. S.N. Medical college Jodhpur. Branching pattern of all 3 parts of axillary artery were traced and presence of one rare variant namely alar thoracic artery was observed from 2nd part of axillary artery.

Case description: Axillary artery as a continuation of subclavian artery after lower border of first rib divided into 3 parts by pectoralis minor muscle. Branching pattern on right side was similar as texted in books, whereas on left side from 2nd part an additional 2 branches named alar thoracic artery suppling axillary fat, lymph nodes and skin of axilla.

Conclusion: Knowledge of variant branching pattern from axillary artery in axilla important for avoiding
possible diagnostic or therapeutic interventional errors like during cardiopulmonary bypass procedures and reconstructive surgeries.

14. Morphometry of minor musculocutaneous perforators of Gracilis muscle: A cadaveric dye injection study

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Background: Gracilis muscle is being widely used as myocutaneous flap because it is easy to harvest, aesthetically suited to the patients and has low morbidity. There are several morphometric studies conducted on perforators of Gracilis but most of them have focused upon major perforators. Very little knowledge is documented about minor perforators of Gracilis. Considering the above-mentioned lacunae and wide range of use of Gracilis as flap the present study was designed.

Aims and Objectives: To identify the source and study the morphometry of minor musculocutaneous perforators of Gracilis throughout the muscle length.

Material and Method: 6 fresh and 6 embalmed adult cadavers of both the sexes were dissected following injection of colored latex in the femoral artery and minor musculocutaneous perforators of Gracilis were observed.

Results: 3-5 minor musculocutaneous perforators were found in each Gracilis muscle. Majority of minor perforators originated from superficial femoral artery (49.5%) followed by profunda femoris artery (25.3%) then medial circumflex femoral artery (21.9%) and femoral artery (3.3%). Distance of point of origin of minor perforator from pubic tubercle in males were significantly higher as compared to females in the upper one-third (85.26± 25.80 mm and 61.86± 24.50 mm respectively) as well as in lower two-thirds (212.72± 45.04 mm and 182.14± 41.07 mm respectively).

Conclusion: 3-5 minor musculocutaneous perforators were found in each Gracilis, this knowledge would help the surgeons in deriving Gracilis flap based on these minor perforators.

15. Accessory slip of lateral head of gastrocnemius muscle with twig from CPN

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Introduction: Variation in muscles is regular and customarily found in routine cadaveric dissections. Most of these variants are benign and occur due to embryological developmental errors in timing. Some of these variations may acutely compromise muscular, vascular, nervous and/or organ system. The superficial muscle group of the posterior compartment of leg comprises of the two heads of gastrocnemius muscle, plantaris and soleus muscle.

Case Report: The present report describes the incidental occurrence of accessory slip of lateral head of gastrocnemius muscle in the right lower limb innervated by a twig from the common peroneal nerve. During routine academic dissection of a male cadaver in the Department of Anatomy, we found an atypical 8 cm long muscle in the right popliteal fossa. It was proximally attached to the lateral aspect of the popliteal surface of femur and distally terminated by joining the lateral head of gastrocnemius. No such variation was found in the left lower limb.
Conclusion: We conclude that this is a novel case of accessory slip of lateral head of gastrocnemius being innervated by common peroneal nerve. This variant muscle mass can possibly compress the tibial nerve and popliteal vessels. And damage to common peroneal nerve that supplies it will have change in the muscle dynamics of the superficial leg musculature. The awareness of this may also prevent its misinterpretation as a pathological structure by radiologists and surgeons.

16. A variant branching pattern of arch of aorta encountered during routine dissection in anatomy  
Fatima Bhopalwala Ali, Jitendra Gupta  
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Background: The arch of aorta and its branches develop from aortic sac and branchial arch arteries. The commonest branching pattern of the Arch of Aorta comprises of its three branches- the brachiocephalic trunk, the left common carotid and the subclavian artery arising from right to left side. These arteries are the chief source of blood supply to the upper limb, head, neck and brain region. Knowledge about anatomical variation and/or congenital anomaly in these vessels is of great clinical importance.  

Method: During routine dissection for the undergraduate teaching, the mediastinum was accessed by removing the sternum and anterior part of ribcage in this female cadaver. The contents were studied in situ and then the heart along with arch of aorta and proximal portion of its branches was dissected out.  

Case Description: In the present case, the arch of aorta had two branches only- the common trunk and the left subclavian artery. The left common carotid artery originated from this common trunk along with the innominate artery. The documented cause of death was non cardiovascular.  

Conclusions: Anatomical variations present in these vessels are important investigative pre requisites for aortic instrumentation and aortic reparative surgeries. These variations should also be kept in mind during diagnosis and management of intracranial aneurysms and vascular disorders of head, neck and upper limb.

17. A database for facial micro expressions among indians  
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Aim: Micro expressions are hardly identified and understood among the people. It plays vital role in understanding true intent of human interactions and behavior. There are hardly any database available on micro-expressions among Indians. The aim of the project was to build a database for micro expressions among Indians.  

Materials and Methods: 112 Indians were materials selected by random sampling for the database. They participated after giving informed consent. Emotionally valent videos were shown and the micro expressions were evoked and recorded. Later, videos are clipped, annotated and compiled into a Database.  

Result: The Indian Micro Expression Database [IMED] was compiled from the videos obtained for expressions like anger, sadness, disgust, contempt, fear, surprise and happiness. Database is available for researchers to enhance knowledge on micro expressions into various fields like machine learning, human interaction and behavioral therapists.  

Conclusion: Micro expressions are very good cue for lie detection, in improving human interactions be it business, academic, social or familial; psychiatric and psychological counselling.
18. Ossified ligaments of spine and its clinical implication

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Background: The various ligaments of vertebral spine are posterior longitudinal ligament (PLL), Ligamentum flavum, anterior longitudinal ligament, and interspinous ligament. These ligaments may ossify in various pathological conditions. Ossified ligaments may cause spinal stenosis and diffuse idiopathic skeletal hyperostosis.

Aims and Objectives: To observe incidence of various ossified ligaments of spine.

Material and Methods: This study was performed on 60 dried vertebral columns of the Department of Anatomy, SRMS IMS, Bareilly and GDMC, Dehradun. In all vertebral column ossification of posterior longitudinal ligament (PLL), Ligamentum flavum (LF), anterior longitudinal ligament (ALL), and interspinous ligament were observed.

Results: Ossification of spinal ligaments were observed in cervical, thoracic and lumbar vertebrae. This ossification is more common in lumbar vertebrae. In cervical region interspinous ligaments present in between atlas and axis vertebrae are ossified which is one of the rare finding.

Conclusions: Ossification of spinal ligaments of vertebrae may cause compression of spinal cord and may result in neurovascular compression which is important for neurosurgeon, physician and orthopaedic surgeon.


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Background: Pterygoalar bar is the name given to ossified pterygoalar ligament which forms a foramen known as porus crotaphitico buccinatorius with posterior border of lateral pterygoid plate. Pterygoalar ligament extends from the root of lateral pterygoid plate to the under surface of greater wing of sphenoid. The ligament may ossify partly or completely leading to the formation of bony bar.

Case Description: A rare case of bilateral pterygoalar bar and porus crotaphitico buccinatorius is being reported in department of anatomy MCDRC Durg. In this present case we found a skull with complete bilateral presence of ossified pterygoalar ligament and foramen known as porus crotaphitico buccinatorius. The ossified pterygoalar ligament is a major cause of the entrapment of the lingual nerve or a branch of the mandibular nerve and may cause mandibular neuralgia.

Conclusion: Knowledge of complete or partial ossification of the various ligaments in the region is important for anesthetists, surgeons and dentists. Being closely related to foramen ovale, such ossified bars of bone may cause entrapment neuropathy of mandibular nerve and its branches. The knowledge of detailed anatomy of the ossified pterygoalar ligament and porus crotaphitico buccinatorius can increase the success of diagnostic evaluation and surgical approaches to the region.
20. Variation in the Formation of the Retromandibular and the External Jugular Veins with Embryological Overview

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**Background:** Awareness of the formation and termination of superficial veins of head & neck, such as, jugular veins, are imperative for anatomists, surgeons, and radiologists during the interventional procedures.

**Case Description:** We report an uncommon variation in the formation of the retromandibular vein and external jugular vein on the right side of an embalmed male cadaver. The joining of the facial vein and superficial temporal vein within the parotid gland formed the retromandibular vein (RMV). The anterior division joined with the submental vein to form an anomalous venous trunk. The anomalous vein united with the external jugular vein (EJV) to form a common trunk in the lower third of the neck and terminated into the subclavian vein.

**Conclusions:** We compared the available literature and embryological development, which showed that the observed variation is rare.

21. Larynx Anatomy

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**Aim:** To study skeletal framework of larynx, laryngeal cartilages and muscles.

**Objective:** The knowledge of laryngeal muscles and its nerve supply is essential to avoid its injury during various surgery.

**Methodology & Results:** In form of flow chart.

**Conclusion:** Intrinsic muscles of larynx are innervated by superior and recurrent laryngeal nerves. Internal branch of SLN under the risk of injury as it is the only nerve traversing from lateral to medial and its injury causes loss in the cough reflex. The RLN gives mostly branches to lateral and posterior cricoarytenoid, inter and thyro-arytenoid muscles. To know about every detail of this nerve is very important for a surgeon to avoid nerve injury during surgery.

22. Anomalous Teres Hepatis Fissure for Ligamentum: An Anatomical Insight

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**Introduction:** Liver is a glandular structure located mainly in right hypochondrium, epigastrium and extending up to left hypochondrium. Anatomically it is divided into right and left lobe anteriorly by the attachment of falciform ligament. Posteriorly it is divided into four lobes - right, left caudate and quadrate lobe by the presence of four constant anatomical features. These include fissure for ligamentum teres hepatis, fissure for ligamentum venosum, groove for IVC, fossa for gall bladder and porta hepatitis.

Fissure for ligamentum teres is formed by invagination of ligamentum teres hepatis. This ligament is an embryological remnant of obliterated left umbilical vein, which during fetal life connects placenta with left portal vein. The knowledge of fissure for ligamentum teres is important for anatomists, radiologists and
Aim and Objectives: A total of 72 formalin fixed cadaveric livers obtained from routine dissection in the Department of Anatomy, K.G.M.U., UP, Lucknow, were obtained for the study. The study was carried for the period of two year starting from September 2018 to August 2020. These specimens belonged to cadavers of unknown origins. Unhealthy and damaged livers were excluded from the study. A bridge of liver tissue was extending between the left lobe and quadrate lobe of the liver, it was covering the fissure for ligamentum teres and converted into passage known as Tunnel. Each liver were observed and then photographed.

Results: 7 out of 72, (9.7%) liver showed different type of anomalies in fissure for ligamentum teres. These were categorized into 4 types: Type 1, 2, 3 and type 4. Further they were divided into two types complete and incomplete on the basis of membrane or liver tissue covering the left lobe and quadrate lobe.

Conclusion: Knowledge of these variations is important for radiologists to achieve correct diagnosis and for surgeons to plan for surgery and to achieve good surgical outcome.

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Background: The entity of absence of Pectoralis Major was included under the Syndromic Manifestation of Poland Syndrome. Pectoralis muscle being a crucial muscle in shoulder movements, its absence could lead to functional disability. In females, it may also be associated with underdeveloped breast tissue.

Case Description: A 28 year old man visited medicine OPD for regular checkup was found to have asymmetry in his chest wall. There was no significant family history of congenital anomalies and long term childhood illness. Further examination there was no scoliosis and anomalies in upper limb. But there was evidence of clubbing noticed in digits. Radiographic examination of the chest showed relative hyperlucency of the chest on right side as compared to left and no evidence of lung herniation. Ultrasound of abdomen revealed, shrunken liver.

Conclusions: Congenital absence or defect has been recorded in many muscles, the most frequently being the Pectoralis Major. They may be partial or complete and often may cause little or no functional disability. But if the anomaly is associated with other manifestations affecting the patient as in case of Poland Syndrome, then symptomatic management or reconstruction surgeries may be required.

24. Double pseudoganglion on the nerve to the teres minor muscle
Monica Baxla and Saroj Kaler, Jhajharia

Background: Pseudoganglion also known as gangliform enlargement are thickenings present on the nerves at their termination such as seen in posterior interosseous nerve, nerve to teres minor muscle.

Case Description: During a routine dissection of the scapular region of a 70-year-old male cadaver in the Department of Anatomy AIIMS, New Delhi two dilations were seen on the nerve supplying the teres minor muscle on the left side. Usually the nerve to the teres minor muscle bears pseudoganglion which is connective tissue around the nerve for protection of the thinned out nerve. The dilations were elongated (1.2 cm) fusiform swelling along the course of the nerve to teres minor muscle.

Conclusion: Perineuronal neuroma which is an enlargement in the nerve can be confused with a
pseudoganglion but can be confirmed by histology.

25. An anatomical variations in Great saphenous vein, Sciatic nerve and its sural, sural communicating branches.

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Introduction: Sciatic nerve is the large nerve formed from the L4 to S3 segments of the sacral plexus. The tibial and the common peroneal components of the sciatic nerve runs in the gluteal region and the thigh and at the superior angle of the popliteal fossa, terminate by dividing into the tibial and the common peroneal nerves. Great saphenous vein begins from the medial end of the dorsal venous arch and runs in front of the medial malleolus, medial side of the leg, and back of the knee joint and reach the saphenous opening where it pierces the cribriform fascia and opens into femoral vein.

Case Presentation During routine educational dissection for medical undergraduates, we observed a low division of sciatic nerve and variation of its cutaneous branch particularly sural and sural communicating nerves which are not communicating with each other. Great saphenous vein joins with small saphenous vein almost at the junction of upper two third and lower one third of the posterior aspect of the leg.

Conclusion: Knowledge of the anatomical variation of the sciatic nerve in the general population particularly high or low division is must for the anaesthetist to perform block of the sciatic nerve during the popliteal block anaesthesia. A detailed knowledge of the branching patterns of the sural and sural communicating nerves and their variations will help to decrease iatrogenic injury to this nerve. Normal as well a variant pattern of great saphenous vein is of great importance since this vein is used for coronary artery bypass graft and cerebrovascular disorders and incompetency of this vein also causes varicose vein.

26. Atypical origin of inferior gluteal nerve and its clinical implication

Shweta Kumari1, Vandana Mehta2, Rajesh Kumar Suri2
1. Santosh Medical College, Ghaziabad; 2. Vardhman Mahavir Medical College and Safdarjung Hospital, New Delhi.

Background: Variations in the origin, division, and course of gluteal nerves have been described in the past. Knowledge of their variant course and distribution can minimize the risk of their injury during various surgical procedures in this region.

Case description: The present study reports an interesting and rare neural variant during routine medical school teaching, where bilaterally the inferior gluteal nerves emanated from the Sciatic nerve and supplied the Gluteus Maximus muscles. On both sides the inferior gluteal nerves were found to be deep to the piriformis muscle. On the right side, the inferior gluteal nerve was present close to the upper border of piriformis and on the left side it emerged below the inferior border of piriformis muscle. Bilaterally the nerves entered the deep surface of gluteus maximus roughly in its middle portion.

Conclusion: The presence of anomalous innervation of the gluteal maximus muscle may create confusion in diagnosing neural conditions and also perplex the operating surgeons. A sound anatomical insight of the possible variants of gluteal nerves are of immense clinical relevance.
27. An Anomalous additional muscle belly of flexor digitorum profundus: A case report

**Anju Choudhary**, Surajit Ghatak, All India Institute of Medical Sciences, Jodhpur

The muscular abnormality in the flexor compartment of forearm is less common compared to that of extensor compartment acknowledgment of such variations could be useful for the clinicians, hand surgeons and plastic surgeons.

During routine dissection of the front of forearm for undergraduate teaching in the department of anatomy, All India Institute of medical Sciences, Jodhpur, we observed a unusual muscle that was a separate belly and tendon of flexor digitorum profundus muscle in a 62 year old male cadaver

In provisions of Clinical and functional significance; the abnormalities of muscles and their tendons in the forearm even though not common are important to the clinician in appropriate detection of etiology for symptoms and management of the patient. Acknowledgment of such variations could be useful for the clinicians, hand surgeons and plastic surgeons.

28. An unusual variation of Axillary artery branching pattern.

**Dr. Unnamatla. Sudha Rani**

Postgraduate, Department of Anatomy, Andhra Medical College, Visakhapatnam.

**Background:** It is not uncommon to observe variations in the branching pattern of the Axillary artery. These variations are required to explain and perform specific vascular procedures and surgeries in the pectoral region.

**Case description:** During routine dissection of a 65-year-old female cadaver's right upper limb, an unusual variation in the axillary artery's branching pattern was noted. The axillary artery first part has the branch superior thoracic artery as usual. The second part of axillary artery has shown a branch of thoraco acromial artery and a common trunk, which gave branch of the lateral thoracic artery and subscapular artery from which branches of the circumflex humeral artery and circumflex scapular artery aroused and later it continued as thoraco dorsal artery. In this case the third part of axillary artery has not given any branches and continued as brachial artery.

**Conclusion:** The knowledge of variation in branching pattern of axillary artery is important for orientation of vascular surgeons, clinical anatomists, and radiologists for performing procedures in the pectoral region where axillary artery has its course.

29. Palmaris longus muscle variation and its clinical implication

**KishoreSesham, JayashreeRaja, Monica Baxla, Rima Dada**

All India Institute of Medical Sciences, New Delhi.

**Background:** Gross anatomical variations in muscle include absence, accessory sites of attachment, presence of multiple bellies, varied course and presence of unusual and/or accessory neurovascular planes. In the current poster, we are presenting one such variation related to a degenerating muscle.

**Case description:** During the undergraduate MBBS curriculum for dissection of upper limb, a variation was observed in the palmaris longus muscle on both sides with respect to the pattern in an elderly male cadaver aged around 55 years. The muscle, considered to be degenerating in evolution, usually has a very short proximal belly and a long tendon inserting into palmar aponeurosis, and helps in anchorage of skin in resisting horizontal shearing forces in a distal direction. In our cadaver, the muscle (total length 27cm) had a flesh muscle belly distally extending about 13 cm in length from the point of attachment to the palmar aponeurosis into the forearm while the middle portion and the proximal portion of the muscle was unipennate (5cm) and
tendinous in nature respectively. We searched for such kind of variation in the literature and found that it is referred to as Inverted Plamaris longus and is rare in occurrence.

**Conclusion:** Palmaris longus plays a crucial role during reconstructive surgeries. Due to hypertrophy of the muscle and its close relation to the median nerve at the carpal tunnel, patients with a reversed PL may present with effort-related compartment syndrome. Thus, knowledge about the anatomical variations of palmaris longus is important both for physicians and surgeons.

### 30. Anatomy of teeth

**Dr. Satish Kumar Sharma,** Department of Anatomy, SMS Medical College, Jaipur, Rajasthan, India

**Background:** 1. Knowledge of tooth anatomy and morphology is important in dentistry. Teeth have two parts: Crown and root. Teeth are composed of 4 dental tissues: Enamel, Dentine, Cementum, and Pulp. Enamel is tough, shiny, white surface of tooth. Dentine is hard but porous tissue located under enamel. Cementum is tough, yellowish, bone like tissue that covers root of tooth. Pulp contains nerves, blood vessels, and connective tissue.

2. Primary teeth - incisors, canine, molars, Permanent teeth are - incisors, canine, premolars, and molars.

3. Eruption of teeth: Primary teeth - central incisors = 6-8 months, Lateral incisors = 8-10 months, Canine = 16-20 months, First molar = 10-15 months, Second molar = about 2 year. Permanent teeth - Central incisor = 7 years, Lateral incisor = 8 years, Canine = 11 years, First premolar = 11 years, Second premolar = 12-13 years, First molar = 6-7 years, Second molar = 12-13 years, Third molar = 17-25 years.

4. Functions of teeth: Incisors = cutting of food, Canines = tearing and grasping of food, Premolars = crush and tearing of food, Molars = chewing and grinding of food

**Aim and Objectives:** To study anatomy of teeth and morphology

### 31. Anterior Interosseous Nerve in relation to the surgically relevant landmarks

**Mamatha Hosapatna, Vrinda Hari, Ankolekar Anne D Souza**

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**Background:** This study explored the origin and course of the anterior interosseous nerve (AIN) concerning the surgically relevant landmarks such as bi-epicondylar line, pronator teres (PT), and Gantzer muscles.

**Methods:** The level of origin of AIN was measured from the bi-epicondylar line, and its length was measured in 44 upper limbs. The number of branches given to flexor digitorum profundus (FDP) and flexor pollicis longus (FPL) were quantified.

**Results:** The nerve originated at a mean distance of 4.16 cm from the bi-epicondylar line. In 12 upper limbs, FDP received two branches, and in 2 limbs, it received three branches. In 13 upper limbs, FPL received two branches from AIN. Gantzer muscle was observed in 18 (40%) specimens and was found superficial to the AIN.

**Conclusion:** Multiple muscular branches to the FPL and FDP were observed in the upper 2/3rds of the forearm. The knowledge of the length and the branching pattern of the AIN would help surgeon plan the nerve transfer surgeries.
32. ‘U’ shaped loop of first part of duodenum, completely covering the head of the pancreas- a case report

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Duodenum is the shortest, broadest and most fixed part of the small intestine. It is 10 inches long and is divided into four parts. Its first part is 2 inches, second part is 3 inches, third part is 4 inches and fourth part is 1-inch length. During dissection classes for medical undergraduates, a rare variation of duodenum was noted in an adult male cadaver aged 70 years approximately. The first part of the duodenum was 4 inches long. It formed an “U” shaped loop, which covered the front of the head of pancreas completely. The lesser omentum extended on to the first two inches of the duodenum. However, the hepatic artery, portal vein and the bile duct were situated behind and the first one inch of the duodenum. Interior of the duodenum presented densely arranged circular mucosal folds and appeared to be normal. The hepatopancreatic ampulla opened into the second part of duodenum in an usual manner. Head of the pancreas was of normal size and appearance. There were no other notable variations among the abdominal organs. The loop of the first part of duodenum might not cause any problems in digestion. But the knowledge of this could be of importance to radiologists. The first part of the duodenum forms the triangular duodenal cap of the radiographs. But, if the first part forms a loop, as observed in the current case, the shape of the duodenal cap could be distorted and lead to diagnostic dilemmas.

33. Superficial ulnar artery with variant accessory origin of brachioradialis muscle: A case report

Ashwini Aithal P, Naveen Kumar

Department of Anatomy, Melaka Manipal Medical College (Manipal Campus), Manipal Academy of Higher Education, Manipal

Background: Ulnar artery is one of the principal arteries of the upper limb. Brachioradialis is a key muscle, and its variation can affect the movements of the elbow joint. This report presents an unusual course of the ulnar artery with the accessory origin of brachioradialis.

Case presentation: Variations were noted in the right upper limb of an adult male cadaver aged approx. 70 yrs. The ulnar artery was arising from the medial side of the brachial artery, descended deep to the deep fascia, and passed superficial to the muscles of the forearm. At the distal third of the forearm and palm, the course of the ulnar artery was normal. Another variation was noted in the same limb. Few fibers of brachioradialis took origin from bicipital aponeurosis, and remaining fibers took origin from the upper two-thirds of the supracondylar ridge of humerus. The radial artery was found just underneath the additional slip of brachioradialis.

Conclusion: A thorough knowledge regarding variations of arteries of the upper extremity is necessary during the performance of vascular and reconstructive surgeries and also during the evaluation of angiographic images. An accessory slip of brachioradialis could lead to compression of the radial artery, causing radial artery entrapment syndrome. Such unusual slips from bicipital aponeurosis may distribute the stress concentration and may work in different directions affecting the supination of the forearm by biceps brachii muscle and bicipital aponeurosis.

34. The amalgamation of the musculocutaneous nerve with the median nerve- A rare entity

Naveen Kumar, Ashwini Aithal P

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**Background:** The communication between the median nerve (MN) and musculocutaneous nerve (MCN) is not a rare variation. However, the entire musculocutaneous nerve, following its emergence through the coracobrachialis muscle merging with the median nerve and supplying the muscles of the anterior compartment of the arm through the latter is a unique finding.

**Case description:** We report here a case of unilateral occurrence of unification between the two peripheral nerves on the right arm of an elderly male cadaver aged about 70 years. The musculocutaneous nerve has taken its normal origin from the lateral cord of the brachial plexus. After piercing the coracobrachialis muscle, the entire nerve has merged with the median nerve and provided its distribution to biceps brachii and brachialis muscles through the trunk of median nerve. Thereafter, the merged nerve continued distally and just above the cubital fossa, the lateral cutaneous nerve of the forearm was given off from the median nerve instead of MCN.

**Conclusion:** Anatomical knowledge of merged MCN-MN connection is necessary to avoid their damage during the management of peripheral nerve lesions to prevent the motor disorders of the upper limb.

35. **Unusual bilateral variation of anterior belly of digastric muscle**

*Rajesh Kumar, Shivshankar SPatil, Kishore Sesham, Harisha Kusuma, Rima Dada*

All India Institute of Medical Sciences, New Delhi- 110029

*Background:* Anterior belly of Digastric develops from first pharyngeal arch while posterior belly develops from second pharyngeal arch. The anterior belly is attached to the mandible’s internal surface in the digastric fossa; the posterior belly originates from the medial surface of the temporal bone’s mastoid process and digastric groove. Both bellies reach and attach the lesser horn of the hyoid bone by an intermediate tendon. The digastric muscle raises the hyoid bone when the infrahyoid muscles are relaxed during swallowing and depress the jaw when infrahyoid muscles fix the hyoid bone.

*Methods:* During routine dissection for undergraduate teaching, unusual variation in bilateral anterior belly of Digastric muscle has been found.

*Case description:* Bilaterally extra slips of anterior belly of digastric muscles have been found. Additional belly proximally originated from digastric fossa and distally crisscrossing with other side additional belly. Both are finally inserting on mylohyoid raphe at upper margin of hyoid bone.

*Conclusions:* These variations are attributed as the embryological remnants of the first pharyngeal arch mesoderm. These variations should be kept in mind during soft tissue imaging and surgeries for different conditions or malignancies in this region.

36. **A bouquet of unusual variations involving nerves of the gluteal region**

*Nidhi Mangla, DeepikaKumari, Vidhu Dhawan, Rima Dada, Jessy J P*

All India Institute of Medical Sciences, New Delhi

*Background:* Nerve entrapment syndromes are one of the causes of pain in the gluteal region.

*Case description:* We report a cluster of variations in the nerves of gluteal region not published previously. These unusual variations were observed during dissection of the right gluteal region of an adult male cadaver. The sciatic nerve was observed to emerge as two separate nerves from the greater sciatic foramen, one coursing through the piriformis and the other at the lower border of the piriformis. The two nerves further joined to form the sciatic nerve proper superficial to quadratus femoris. The inferior gluteal nerve (IGN) as well as the posterior femoral cutaneous nerve (PFCN) were observed as a branches of the sciatic nerve. IGN was given
off from the nerve which traversed through the piriformis, while PFCN was found to emerge as two separate branches from the nerve at the lower border of piriformis. Additionally these two branches entrapped the inferior gluteal artery and then joined to form PFCN proper. Some variations have been previously described in this region. However these variations have never been reported together in single cadaver.

Conclusion: The complete and holistic knowledge of such rare variations in this region will be of help to the clinicians who deal with nerve entrapment syndromes. Surgeons performing posterior approach hip arthroplasties should also keep such variations in mind to prevent inadvertent iatrogenic complications.

37. An associated mass lesion in the anastomoses between the median and ulnar nerve in axilla: a case report

Kishore Sesham, Dibakar Borthakur, Harisha Kusuma, Rima Dada. All India Institute of Medical Sciences, New Delhi

Background: Anastomoses between the nerves can cause changes in the normal anatomical pattern of sensory-motor innervation because of the exchange of nerve fibres. In the current poster, we are presenting one such anastomoses in which a mass lesion was observed as an accidental finding.

Case Report: During the routine undergraduate dissection of upper limb (right), we observed an encapsulated, highly vascular ovoid mass lesion measuring 5cm x 2cm which turned out to be neurofibroma (histopathology) in the abnormal communicating loop between the median and ulnar nerve in the axilla of an elderly male cadaver aged around 65 years. The lesion was neither visible nor palpable on gross examination prior to dissection probably due to axillary pad of fat, indicating the location of mass to be relatively deep. Apart from this communicating loop and its associated lesion, the other branches of the brachial plexus did not show any variations. No such communication or lesion was noted on the left side. There were no evident distal muscle atrophic changes, indicating the benign nature of the lesion. This anastomoses was different from all the four different types: Martin Gruber or Marinacci (forearm), Riché and Cannieu or Berretini (hand) described in the literature.

Nerve anastomoses in peculiar places have clinical and functional relevance. Clear knowledge about the possible nerve anastomoses is important for physicians and surgeons due to possible disparity of sensory-motor innervations in diagnosing peripheral nerve neuropathy or in treating injured nerves post trauma or post development of mass les.

38. Anomalous renal vasculature - a case report

Sarah Sangma

Background: Kidneys are the most important excretory organs in human body. Each kidney is supplied by one artery and drained by one vein generally. Anomalies in renal artery is quite common while that in the vein is not as common. Renal artery variations including their source and number are very common (30% Indian, 35.5% Bosnian, 17.1% Iranian population). Most common variation of renal vasculature is presence of accessory renal arteries. Renal vein variations include their number and drainage.

Case Description: During routine dissection for undergraduate we came across anomalous vascular pattern of renal vessels of 65 years old adult male cadaver at All India Institute of Medical Sciences, New Delhi, India. We observed that left kidney was supplied by two arteries. One main renal artery and one accessory renal artery supplying lower pole. A single renal vein drained the left kidney. Right kidney was supplied by three arteries. One main renal artery and two accessory renal arteries supplying the upper pole and lower pole. Two veins drained right kidney, one main right renal vein and one accessory renal vein.
Conclusion: The clinical importance of anatomical variations in a human body is seen with the development of new operative techniques. A difficult urologic procedure not only requires a urological surgeon to be thorough with the human anatomy of urinary system but also with many unreported variations related to it.

39. An extended attachment of lesser omentum onto visceral surface of liver: a case report

Kishore Sesham, Deepika Kumari, Rajesh Kumar, Saroj Kaler*, All India Institute of Medical Sciences, New Delhi.

Background: All the abdominal viscera project into the cavity of peritoneum forming two layers i.e. the parietal layer covering the body wall and the visceral layer covering abdominal viscera. The layers of peritoneum covering the surface of the liver is usually termed as ligament while for small intestine and colon termed as mesentery and mesocolon respectively. These peritoneal folds act as conduits for the passage of neurovascular structures from retroperitoneum to the intraperitoneal organs. They also form boundaries of various peritoneal spaces. In this poster, we are presenting an extended attachment of lesser omentum on the visceral surface of liver.

Case description: During the undergraduate MBBS dissection for the undergraduate students, we found encroachment of lesser omentum (5cm x 3.5 cm in dimensions) onto the gastric impression region on visceral surface of liver apart from regular attachment sites (lesser curvature of stomach and proximal 2.5 cm duodenum to fissure for ligamentum venosum) in a male cadaver aged about 55 years. No such description was noted in the literature till date.

Conclusion: In this abstract, we presented a new finding of extended attachment of lesser omentum not reported in literature till date containing neurovascular structures. Significance of these kind of variations yet to be explored.

40. The Metopic Suture—Facts and Faiths.

K. Uma, V. Lokanayaki, Y.Jalaja.

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Background: The cranial shaping and growth is an engrossing fact when we study about the cranial sutures and its evolution. Metopic suture, a dentate type of suture which gets ossified from two primary centers in frontal bone. According to Gray, the metopic suture usually closes by first postnatal year, may persists in small percentage of adult skulls of about 1-12%. The persistence of metopic suture is called Metopism, which usually extends from Nasion to Bregma.

Aim: To study the persistence of Metopic suture in 30 adult dry skulls.

Methods: 30 adult dry skulls with persistent metopic suture were examined in detail from Department of Anatomy, Government Kilpauk Medical College, Chennai.

Results: Out of 30 adult dry skulls examined, metopic suture was found in 07 (23%) skulls. Out of 07 skulls with metopic suture, 02 were complete, 05 were incomplete. In incomplete metopic suture, 02-Linear, 01-H shaped, 01-U shaped and 01-V shaped.

Conclusion: Persistent metopic suture is clinically very important. Though not pathological, the metopic suture may be an incidental finding in X-ray skull. This should be considered as one of the differential diagnosis in ruling out Skull fractures especially Frontal bones. Premature closure of Metopic suture is also of greater importance as it associated with underdevelopment of Brain and frontal sinus hypoplasia.
41. Anatomical study of sacral hiatus
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Background: The sacrum is a bone which contributes to the formation of pelvic girdle. The sacral hiatus exhibits variations in morphology which differs among populations. These variations may influence the success of caudal epidural injections for anaesthesia. The knowledge of anatomy of sacral hiatus plays a major role in success of correct needle placement during anaesthesia.

Aims and objectives: To study the anatomy of sacral hiatus.

Methods: 25 complete and undamaged dry sacral bones of unknown sex were used which were obtained from the Department Of Anatomy, Kilpauk Medical College, Chennai. Parameters of sacral hiatus such as shape, length, level of apex in relation to sacral vertebra, anteroposterior diameter at apex were studied.

Results: The inverted ‘V’ shape was the commonest shape (36%). Length of the sacral hiatus ranged between 7.6 mm and 38.9 mm. The apex of sacral hiatus was at the level of fourth sacral vertebra in 56% of cases. The anteroposterior diameter at the apex ranged between 2.8 mm to 5.4 mm.

Conclusion: The understanding of the sacral hiatus anatomy helps to define the landmarks clinically used during caudal epidural anaesthesia.

42. Morphometric analysis of supraorbital foramen in South Indian dry skulls with its clinical implications in craniofacial surgeries
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Background: Locating the supraorbital foramen and notch is very important as it transmit supraorbital vessels and nerve which can get damage while doing several surgeries like eyebrow lift surgery and treating facial wounds. This study was aimed to find out the occurrence of supraorbital notches and foramina, dimensions of foramen and to locate its distance from the nasion.

Materials and Method: The study was carried out on 50 dry skulls. Measurements of supraorbital foramen were taken from the nasion. Presence or absence of notch and foramen was also noted. Dimensions of foramen were also noted. Data analysis was done by using the Statistical Package for Social Sciences (SPSS) 19 version.

Results: The mean distance of the supraorbital foramen to the nasion was 2.39, 2.29 cm on the right and left side respectively. The mean width and height of the foramen was 6.36 and 2.7, 5.36 and 3.1 mm on the right and left side respectively. Bilateral notch and foramen was present in 38% and 22% of skulls, one side notch and one side foramen was seen in 34% of skulls and both side supraorbital notch was absent in 6% of skulls.

Conclusion: These measurements will aid surgeons while doing various craniofacial surgeries.
43. Morphometry of stylomastoid foramen

P. Vijayan, V. Lokanayaki, S. Supadevi, Department of Anatomy, Government Kilpauk Medical College, Chennai

Background: Facial nerve block is often used in emergency department for wound debridement, pain relief, wound closure and also for cataract surgery. Stylo mastoid foramen is anatomically constant through which facial nerve trunk exits and identifying its precise location with a reliable and palpable landmark like mastoid process can decrease nerve injury and complications.

Aim: To study distance and position of stylomastoid foramen in relation with mastoid process

Methods: 25 dry skulls collected from Government Kilpauk Medical college were studied bilaterally. Two imaginary lines as given below were drawn and the distance between tip of mastoid process to center of stylomastoid foramen (CSMF), distance between upper end of anterior border of mastoid process and CSMF, position of CSMF in relation to XY and angle between AB and the shortest distance between mastoid process to CSMF were measured on both sides of the skull.

A. Transverse line passing through the upper end of the anterior border of both mastoid processes (XY).
B. Antero-posterior line passing through the tip of the mastoid process (AB) which is perpendicular to line joining the tips of mastoid processes of both sides

The measurements were taken with help of scale, double-tipped compass and transferred to calipers and distances measured

Result: Results will be analysed and datas will be shown at time of presentation

Conclusion: Mastoid process is easily identifiable and most reliable landmark for facial nerve block.

44. Morphometric and topographic study of nutrient foramen in human clavicle

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Introduction: The nutrient artery is the main source of nutrition to the long bones. It enters the long bone by way of nutrient foramen.

Aims and objective: This study aims at determining the number, size and location of the nutrient foramen and its variations in the same, which will be of interest to surgeons in certain operative procedures to preserve the circulation.

Material and methods: The study was conducted in total 60 clavicle bones of both side. The number and position of nutrient foramen was determined by foramina index and its direction was also observed. The material collected for our study was from the department of anatomy, King George’s Medical University, Lucknow.

Results: The nutrient foramen was present in all the clavicles. One nutrient foramen was present in 66.7%, two in 30% and three in 3.3% of clavicles. Predominant position of nutrient foramen was on the posterior surface 75% and predominant location was in the middle one third 70% of clavicles. Direction of all the nutrient foramina were towards the acromial end.

Conclusion: The study of number, position, location and direction of nutrient foramina of clavicles are useful to preserve the arterial supply during surgical procedure like internal fixation and vascularised bone graft.
45. Elongated styloid process (Eagle’s syndrome): A case report

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First year resident¹; Professor and Head²; Department of Anatomy, B. J. Medical College, Ahmedabad, Gujarat, India.

**Background**: The styloid process is a thin, cylindrical, sharp osseous process, deriving from the posterior lower surface of the petrous part of temporal bone (just anterior to stylomastoid foramen). The normal length of the styloid process ranges from 25 mm to 30 mm. Its tip is located between the external and internal carotid arteries, just lateral to the tonsillar fossa.

**Case description**: During routine osteology study in the Department of Anatomy, B. J. Medical College, Ahmedabad, Gujarat; it was observed that in a dry bony specimen of right sided temporal bone, the styloid process was 37mm in length.

**Conclusion**: Eagle’s syndrome occurs when an elongated styloid process or calcified stylohyoid ligament causes recurrent throat pain or foreign body sensation, dysphagia, facial pain, neck pain with radiation to the ipsilateral ear. Inflammatory changes or impingement of the adjacent arteries or sensory nerve endings may occur. Any overpressure at the surrounding area of tonsillar fossa or violent manipulations around the neck area by medical, paramedical or manual therapists and rehabilitation personnel may lead to fracture, with many clinical subsequences for the patient. It might be of clinical significance to ENT surgeons, neurosurgeons, general surgeons, radiologists and physicians.

46. Synostosis of First and Second Rib: A Case Report

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**Background**: Congenital anomalies of the ribs are rare and they are usually discovered as an incidental finding during routine radiography. Bicipital rib results due to fusion of cervical rib with the first rib or the first rib with the second rib. Its occurrence is not uncommon and more frequently unilateral.

**Case Description**: During routine osteology teaching in the Department of Anatomy, B. J. Medical College, Ahmedabad; it has been observed that one of the first rib was fused with the superior surface of the second rib on the left side, 2.5 cm from the tubercle of first rib obliterating the first intercostal space.

**Conclusion**: Synostosis of ribs is usually asymptomatic but they may cause musculoskeletal pain or intercostal nerve entrapment. Involvement of 1st rib is one of the causes of thoracic outlet syndrome. A rib anomaly usually indicates an underlying systemic disease and might need surgical intervention. Precise knowledge and awareness of such anomalies is important for anatomists, clinicians, thoracic surgeons and radiologists.

47. Estimating body height from ulnar bone length in north Indian population

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**Background**: The height of an individual is a very important parameter for establishing the identification. The height can be indirectly estimated from different parts of the skeleton. Ulna bone has been chosen here because it is subcutaneous and can be used for measurements.

**Aims and Objectives**: To estimate the height of an individual from the length of ulna using a derived equation
and to compare the results in different populations.

**Methods:** The study was done on 200 students of the Nims Medical College. The subjects ranged from 20-30 years and were healthy. The height of the individual was measured from vertex to heel and the length of right and left ulna bones was measured from olecranon process to styloid process. The data was tabulated and analysed statistically.

**Results:** The correlation coefficient between ulna length and stature is 0.33 in males, 0.26 in females and 0.05564 in combined. And P value is P<.001. The regressions equation derived are: For males: Y=25.99X; For females: Y=23.05X; For both male & female (combined): Y=24.56X±17.27

**Conclusion:** The ulna bone length is a reliable and accurate parameter which is used in estimating the height of an individual. The regression equation derived from this study can be useful to anatomists, clinicians, anthropologists and forensic scientists.

48. **Anatomical study of variations of sacral foramina in human in North India and its clinical relevance**

**Anam Ahmad, Punita Manik, Anita Rani, Rakesh Kumar Diwan, Rakesh Kumar Verma**
Department of Anatomy, KGMU, Lucknow.

**Introduction:** The sacrum is a large, triangular bone formed by the fusion of sacral vertebrae S1-S5. Sacrum is the most variable portion of spine. Ventral surface of the sacrum bears four pelvic sacral foramina, they are smaller in size and less regular in form than those at the front, they transmit the posterior divisions of the sacral nerves.

**Aims and Objective:** The present study aims at determining the numerical variations of pelvic and dorsal sacral foramina of dry human sacrum which is important for caudal anaesthesia during surgical procedures.

**Material and Method:** The study was conducted on 60 dry human sacra irrespective of age and sex and was observed for numerical variations in the sacral foramina. The material collected for our study was from the department of anatomy, King George’s Medical University U.P., Lucknow.

**Result:** From 60 dry human sacra examined for variation in number of pelvic and sacral foramina. 4./. were found with three pairs of sacral foramina, 2./. with five pairs of sacral foramina. Normal four pairs of sacral foramina is seen in all other sacra.

**Conclusion:** The study provides information about variations of sacral foramina in human which is important for anaesthetics, radiologists, obstetricians and forensic experts.

49. **Morphometry Of Nutrient Foramen Of Human Long Bones Of Upper Limb**

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**Background:** Nutrient foramen is a natural opening into shaft of a bone through which nutrient vessels passes into medullar cavity. Knowledge of position, number & variation of nutrient foramina may be used in certain surgical procedures & disease analysis.

**Aim:** To determine the number, size, direction, site & location of nutrient foramina in long bones of upper limb.

**Materials/Method:** Macroscopic study on bones obtained from Anatomy Department KGMU, Lucknow for number, size, site, direction & location of nutrient foramina comprised of 100 upper limb long bones from
unknown age & sex which included 25 ulna each of both sides & 25 Radius each of both sides.

Result: In Ulna foramen was absent in 16 % of right and 8% of left while balance ulna had single foramen. Location of maximum was in 1/3 part of shaft with average 8 cm distance from upper end.

In Radii 12% of right and 4% of left had no foramen, 84% of both sides had single foramen, 4 % of right and 12 % of left had double foramen. Location observed in right was 56% on anterior surface, 24% on medial border and 4% on radial tuberosity while for the left side it was 52% on anterior surface, 32% on anterior border and 4% on posterior border.

Analysis showed 36 % of nutrient foramen of Right Side & 64 % of left were present in upper 1/3rd of shaft while 48% of Right & 44 % of left were present on middle 1/3rd of shaft.

Average length of both sides Ulna is 26 cm & Radius is 25 cm. All nutrient foramen in both Radius & Ulna were directed upward with average 0.1-0.2 mm diameter.

Conclusion: The data obtained from present study will be of interest to clinicians who are involved in surgical procedures and in the interpretation of radiological images.

50. Anatomical variation of Tibial plateau angle in north Indian population: Dry bone study.

Arun Kumar1, Rakesh Kumar Verma2, Punita Manik3

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Background: Medial and lateral tibial plateau have a slope directed postero-inferiorly relative to the long axis of the middle of the shaft. It has important consideration in surgeries such as knee arthroplasty, high tibial osteotomy and other surgery around the knee joint. The present study was to estimate the tibial plateau angle (TPA) on the dry tibia bones in north Indian population.

Aims and Objectives: To assess the medial and lateral tibial plateau slope in normal tibia(dry bone study).

Methods: A total 200 dry human tibia bones were analyzed for this study. The bones were obtained from the Department of Anatomy, King George’s Medical University U.P., Lucknow. The TPA angle measure in dry bone by direct method with the help of goniometer.

Results: Tibial plateau slope of medial condyle(16.06±2.91) was found to be significantly higher than lateral condyle (11.97±3.03) for overall dry bones as well as of both the laterality. Non-significant correlation with tibial length and laterality.

Conclusion: The present study described the variations of the TPA in the adult north Indian population (range 6°–24°, mean ± SD 14.1° ± 3.5°, no laterality, no tibial length correlation ). Knowledge of this study is important for better outcome after high tibial osteotomy and TKA.

51. A case report of a domed bony jugular fossa in the human dry skull and its clinical correlation

Yuvraj Sharma1, Dr Chandrakala Agarwal2

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Background: The knowledge of jugular region is of great importance as the region have many neurovascular structures are in relation with the region.many variations are found in the region (like presence of domed bony roof of jugular fossa, septation of jugular foramen by intrajugular process ). The jugular fossa is a depression
in inferior of the petrous temporal bone which have bulb of jugular vein.

**Description:** During routine osteology class at the department of anatomy, SMS Medical college, jaipur, a skull with the left side domed bony jugular fossa was noted. Masses in the jugular fossa are likely to develop, originating from vascular, neural, cartilaginous or meningeal, embryonal rests or metastases type of origin.

**Conclusion:** In the case of masses in the domed bony jugular fossa may cause abnormal phoning and swallowing, syncope, pulsatile tinnitus, neck and shoulder weakness or hypotension. A surgeon should know the anatomy of region case of removing the masses as the important structures are present in relation to fossa.

52. **Estimation of carrying angle in population of Eastern Uttar Pradesh**

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Department of Anatomy, Maharshi Vashishtha Autonomous State Medical College, Basti

**Introduction:** When the elbow is fully extended and forearm is in supination, the long axis of arm forms an obtuse angle with the long axis of forearm at the lateral side is defined as carrying angle. It is about 170 degree in males and 167 degree in females. Generally, females have greater carrying angle than males due to wider pelvis.

**Aim & Objectives:** The aim of the study is to measure the carrying angle of both upper limbs & to compare the carrying angle on dominant and non-dominant side of upper limb & to find out sexual dimorphism.

**Material and Method:** The study was performed in the department of Anatomy, Maharshi Vashishtha Autonomous State Medical College, Basti on 400 individuals (200 males & 200 females) in population of Eastern Uttar Pradesh. Carrying angle were measured with the help of goniometer. Landmark is marked with skin marker. Data obtained is analyzed statistically by using t-test in which p-value is determined which was significant when < 0.05 and p-value was highly significant when < 0.0001.

**Result:** We determine that mean carrying angle was obtained 171.41 degree in the dominant upper limb with maximum value of 176 degree and minimum of 165 degree while mean carrying angle was 170.35 degree in the non-dominant upper limb with maximum value of 174 degree and minimum of 163 degree.

**Conclusion:** In the present study we obtained that carrying angle in females is less than males in both dominant and non-dominant upper limb.

53. **Morphological and morphometric study of scaphoid bone and its clinical significance**

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**Introduction:** Scaphoid is the most commonly fractured carpal bone more prone for non union and delayed healing due to its restricted blood supply, thus leading to avascular necrosis of scaphoid. To avoid complications, the scaphoid fracture has to be recognized in time and treated early.

**Aim & Objectives:** The present study is carried out to observe the morphological variations of scaphoid and to measure its dimensions.

**Methods:** 30 dried adult human scaphoid bones were studied from the Department of Anatomy, Govt. Kilpauk Medical College, to identify the possible morphological variations. The morphometry of scaphoid was measured using vernier calipers. The circumference and length were measured using a thread. Magnifying glass was used to identify the nutrient foramina. The shape of tubercle, dorsal sulcus, and nutrient foramina on the dorsal sulcus were also observed and noted.
Result: The results will be analysed and data’s will be shown at the time of presentation.

Conclusion: The morphological and morphometric data thus obtained from this study can be compared with the previous studies, and it will be helpful for the early clinical intervention to avoid avascular necrosis of scaphoid.

54. Anatomical variations at the insertion of the palmaris longus tendon
Suresh sharma

Background: The palmaris longus muscle arises from the medial epicondyle by the common flexor tendon, adjacent intermuscular septa, antibrachial fascia and its long tendon passes in front of the flexor retinaculum and is continuous with the central part of the palmar aponeurosis.

Case description: During a routine dissection, a rare variation in the insertion of the palmaris longus tendon was observed. In the right forearm, the palmaris longus tendon bifurcated and giving rise to an accessory muscle, which passed superficial to the ulnar artery and ulnar nerve.

Conclusions: During reconstructive surgeries, surgeons agree that the palmaris longus tendon is the first choice as a tendon donor because it fulfils the necessary requirement in length, diameter and availability, and can be used without resulting in any functional deformity and every surgeon should be aware of the variations in the insertion of the palmaris longus tendon.

Dr. Jitendra Singh¹, Dr. Sangita Chauhan², Dr. Dhiraj Saxena³, Dr. Nandlal⁴

Background: Arcuate foramen transmits vertebral vessels and sympathetic plexus. Any additional foramen on atlas other than foramina transversaria is termed as arcuate foramen. Presence of arcuate foramen in various countries giving incidence from 5%-23%. Embryological variations in the presence and passage of vertebral vessels will manifest as variant foramen.

Aim and Objectives
Aim- To find the incidence of arcuate foramina in the first cervical vertebrae. Objective- To clinically correlate the incidence of arcuate foramina.

Methodology & Results: After applying inclusion and exclusion criteria the study was conducted on fully ossified 45 dried human atlas adult vertebrae of unknown sex in the Department of anatomy, S.M.S. Medical College. The arcuate foramen were observed and classified according to (Mitchell, 1998).

Conclusion: The incomplete and complete arcuate foramen may get damaged during neck injuries and surgeries related to lateral mass fixation of the atlas and may damage neurovascular structures related to first cervical vertebrae. Hence the knowledge of such variations is important for neurologists, radiologists, physicians and orthopedists.

56. Anatomical study of right and left coronary arteries in human cadaveric hearts
Dr. Rahul Kulhari¹, Dr. Dhiraj Saxena², Krati Bhardwaj³

Background and Objectives: Knowledge of the coronary arterial system will help in accurate interpretation of coronary angiograms. Awareness of the variations of branching pattern of coronary arteries will help during interventional procedures like angioplasty, balloon dilatation, bypass surgery etc. In the present study, the coronary arteries were studied to note their normal origin, course, branching pattern, dominance and variations.
Methodology & results: In the form of flow chart

Conclusion: 2 coronary arteries existed in most of the specimens studied. Third coronary artery was present in few hearts. Right dominance was more common. Prerequisite knowledge of normal and variant anatomy of coronary artery and their branches is important for cardiothoracic surgeons to plan their surgeries, radiologists to interpret the angiograms and for anatomists for academic and research purposes.

57. Study of types of dorsal venous arch of Hand and formation of basilic and cephalic veins

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Background: Veins of the hand is placed superficially and is easy to trace for various clinical procedures. Basilic vein (medial aspect) and Cephalic vein (lateral aspect) of the hand are clinically important for various surgical and invasive procedures.

Aim and Objectives: To study the various types and pattern of dorsal venous arch and the formation of the basilic and cephalic vein.

Methods: This is a cross-sectional observational study conducted in 100 hands (50 hands of male, 50 hands of female) in Department of Anatomy, SSMC, Tumakuru. The Dorsal Venous Arch is made prominent by putting a tourniquet at the proximal to the wrist and observed various types of arch and formation of basilic and cephalic vein. The types and pattern were noted and photographed adequately.

Results: The present study results showed 62% of male hands were type 2 pattern of arch and 56% of female hands were type 1 pattern of arch. In male, size (formation level) of the cephalic vein was bigger than basilic vein. Males had more prominent venous network than females.

Conclusion: The present study concludes, the dorsal venous network and formation of basilic and cephalic veins to give an opinion to clinicians, nurses and paramedical staffs for better understanding of this day-today clinically important structures for various emergency clinical procedures.

58. Occurrence of multiple asymptomatic subdural osteomas: A cadaveric case report

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Introduction: Osteomas are most common primary bone tumours of skull bones. These are found intracranial or extracranial in position, small in size and trabeculated in histological observation. Though exact etiology is not known, but different theories are given for different cases. They are usually found incidentally or may be associated with Gardner’s syndrome.

Case description: During routine dissection for MBBS students in an 87 years old female cadaver, we found multiple (6 in number) irregular, lobulated bony masses/structures between the dura mater and arachnoid mater that was compressing the adjacent brain tissues forming impressions on it or outside duramater. They were collected, measured, and observed under microscope by preparing slides after decalcification. On histological examination, they were having osteocytes in lamella forming irregular trabeculae at the centre and scattered osteocytes at periphery. The intertrabecular spaces were occupied by scarce loose fibrovascular tissue.

Conclusion: Among all types of intracranial osteomas (0.43% of all tumours), subdural osteomas are rare types. Whenever present, mostly, they are multiple. As there is an increase in the size of the mass, the patient usually presents with generalised intracranial pressure symptoms like nausea, headache, seizure, behavioural
changes etc or localised effect, according to the location and size of the lesion. So, it is essential to identify and remove all such subdural osteomas if one is identified on CT or MRI.

59. Absent common hepatic artery and variant right hepatic artery - An incidental finding on CT imaging

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Background: During abdominal surgery, blood supply to the liver and other abdominal organs plays a vital role. The knowledge with regards to hepatic artery variations is crucial for varied surgical and radiological procedures concerning the liver, and dutiful to be reported.

Aims and Objectives: To report a case of variant origin of right hepatic artery to contribute to the existing knowledge pool to improve surgical safety.

Methods: The present case describes a variant hepatic vascularization encountered on 3D volume rendered CT imaging of a 60-year-old male admitted to the hospital emergency for recurrent abdominal pain.

Results: The common hepatic artery was absent. The right hepatic artery was observed to arise from superior mesenteric artery, while the left hepatic artery arose directly from the coeliac trunk.

Conclusion: Awareness of such abnormalities is critical to minimize morbidity and help to prevent a variety of operational complications in hepatic surgery or during liver transplantation.

60. Exploration of coeliac trunk for its morphometry and positional relationships using cadaveric and radiological methods

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Background: Extensive radiological applications have renewed interest in the study of coeliac trunk (CT) morphometry. Knowledge of positional relationships of the CT to the other ventral branches and to the aortic bifurcation (AB) could be useful for studies that explore embryological mechanisms determining the development of arteries

Objectives: To conduct a comprehensive exploration of CT in a homogenous population group for morphometry and its positional relationship to the other ventral branches of the abdominal aorta and to the aortic bifurcation using multidetector computed tomography (MDCT) imaging technique.

Method: CT in 20 formalin fixed cadavers and in 50 MDCT angiography images from subjects that included both genders were assessed in this cross sectional study. Measurements of stem length, diameter, distance of origin from the superior mesenteric artery (SMA), inferior mesenteric artery (IMA) and AB were taken.

Result: Stem lengths and diameter values were consistent with literature. Absolute values of distances of CT from AB and from the other ventral branches significantly differed between genders. Cadaveric studies had lesser proportional CT-IMA distances but higher absolute values of IMA-AB distances compared to MDCT studies.

Conclusion: Absolute values and not proportional values, of distances of CT from the other ventral branches is determined by gender. Differences in inter-arterial distances between cadaveric and radiological specimens highlights the relevance of substantiating cadaveric data with in-vivo studies. Increase in the distance of origin
of CT from AB is likely to increase CT-IMA distance without affecting the CT-SMA positional relationships.

61. A rare anatomical variation of common Coeliacomesenteric trunk- A cadaveric and MDCT angiographic evaluation

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Background: A least frequently reported variation of all abdominal vascular anomalies is the presentation of common coeliacommesenteric trunk with celiac and superior mesenteric artery having a common origin from the aorta. Such rare variations if ignored can lead to life threatening complications.

Aims and Objectives: To study and correlate the occurrence of this variation in 50 cadavers and 50 persons by angiography using MDCT scanner and to compare the data with the available literature.

Methods: The study was conducted on 50 embalmed cadavers in the department of anatomy at Deccan College of Medical Sciences, Bhaskar and Osmania Medical College for a period of two years and on 50 persons who underwent abdominal MDCT angiography at Owaisi Hospital and Research centre and Princess Esra Hospital for the same time period. Data entry was done using MS-Excel and Statistical analysis was done using SPSS software.

Results: The occurrence of this variation was found to be 2% in cadavers as well as on MDCT angiography.

Conclusion: Accurate knowledge of such rare variations will help in avoiding complications in abdominal surgeries and successful accomplishment of surgical, oncological and interventional procedures and to avoid diagnostic mistakes and therapeutic complications.

62. A Radiological Examination On The Trabecular Pattern In Upper End Of Femur In Postmenopausal Women

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Introduction: Osteoporosis is a disease of bone that lead to an increased risk of fracture. It is a worldwide medical abnormality affecting older populations, especially women. It is a major health problem characterised by low bone mineral density and a reduction in bone strength. The upper end of the femur is a common site for osteoporosis.

Aims & Objectives: The aim of the study is to identify the trabecular pattern radiographically in the upper end of femur by Singh index & to correlate the Singh index with femoral geometry & body mass index in postmenopausal women.

Material & Methods: The study was conducted on 50 pelvis radiographs of post menopausal women who was age between 45-60 years in the department of radiology, MVAS Medical College Basti. Baseline values are recorded for all women, including age, weight, height. To determine the trabecular pattern by Singh index, the AP radiographs of the pelvic region including hip joint was taken at a distance of 100 cm in neutral flexion, abduction & 15 degrees of internal rotation. Karl Spearman’s & Pearson correlation coefficient was used to analyze the parameters under study.

Results: We determine that the Singh index is correlated significantly with hip axis length, femoral neck diameter, trochanteric width. If Singh index is correlated with BMI there was no a significant relationship between the Singh index and BMI (p>0.005). The evaluation of the Singh index grades in its self, there was a significant relation among them
Conclusion: On the basis of our findings we found that the Singh Index and femur geometry may play role in the determination of level of osteoporosis and limiting its progress in its early stage.

63. Smaller right anterior cerebral artery and enlarged anterior communicating artery: a case report
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Background: The anterior cerebral artery is the smaller terminal branch of the internal carotid artery. It supplies the most mediasl surface of front lobe and superior medial parietal lobe and is part of the Circle of Willis. Right and left anterior cerebral arteries are connected by the anterior communicating artery. The parts of the anterior cerebral artery are proximal and distal. Anatomical variations of anterior cerebral artery such as hypoplasia or double or triple have been reported. Obstruction or rupture of the anterior cerebral artery beyond anterior communicating artery might not normally result in serious ischemia to the brain because of the collateral circulation through the Circle of Willis. But when it is absent on one side or it is hypoplastic, it may result in serious problems. There are numerous reports in the past regarding variations of anterior cerebral artery.

Case Discussion: We report a rare case of large anterior communicating artery associated with smaller right anterior cerebral artery. The right anterior cerebral artery was traced from its commencement, anterior communicating artery was also observed. The right anterior cerebral artery was smaller in size at its commencement when compared to its counterpart adjoined by the anterior communicating artery which was larger.

Conclusions: The knowledge of variations of anterior cerebral artery is very important for neurosurgeons and radiologists to minimize the possible post-operative problems around the base of the brain. The variation observed during routine dissection in the proximal part of the anterior cerebral is rare and clinically significant.

64. Base of Skull - Kawase’s Triangle
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Tutor\textsuperscript{1}, Professor, \textsuperscript{2,3} Adtl.Professor, \textsuperscript{4}, Yenepoya Medical College Department of Anatomy, Mangalore

Background and aim: The skull base is a technically difficult region for neurosurgeons, and many surgical approaches to this area have yet to be perfected. The petrous apex and the middle cranial fossa is a commonly explored area in neurosurgeries and hence require a detailed knowledge and awareness of topographic variations is a mandatory practice in cadaver laboratory.

The aim of this study is to present the anatomy and measure the dimension of kawase’s triangle.

Material and Methods: This morphometric study was conducted in September 2020 in the Department of Anatomy. 30 dry adult open skull bones of both sexes were used (60 petrosal apices) to analyse a number of parameters relevant to anterior petrosectomy.

Results: the kawase’s triangle in the present study had a mean surface area of right side 93.1 $\pm$ 28.08 whereas the left side 99.5 $\pm$ 29.39

Conclusions: The skull base surgeries demand for high end precision and proficiency. The present study analysis throws significant light on certain parameters it will be helpful in doing anterior petrosectomy safer
65. Neural stem cell activity in the striatum of rat brain following transient occlusion of middle cerebral artery

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Background and Rationale: Stroke triggers proliferation of the neural stem-cells in the sub-ventricular zone (SVZ) that migrate towards the damaged area. The progenitor cells express Sox2. They express DCX during migration and differentiation into immature neurons. Here, we studied the changes in the expression of Sox2 and DCX in the striatum during early and late timepoints after inducing stroke in rats.

Methods: After obtaining ethical clearance, we induced cerebral ischemia for 60-minutes by occluding the middle cerebral artery in four adult male Wistar rats, weighing 270-300g, with a silicon-tipped filament. Reperfusion followed occlusion. In control animals, we performed sham surgery. Neuronal deficit scoring was recorded 24-hours before and after surgery. On days 4 and 14, brains were dissected out, flash-frozen and stored at -80°C. Protein was extracted from striatum of stroke-affected side and immunoblotting was performed to study the expression of Sox2 and DCX.

Results: In the stroke-induced group, rats that were included in the study had a neurological deficit score of 1 or 2 after surgery. On day 4, expression of Sox2 was significantly higher in MCAO group than in controls (p=0.0029). On day 14, there was no significant difference in the expression of Sox2 (p = 0.1143). There was no significant difference in the expression of DCX between the two groups on both days 4 and 14 (p = 0.89, 0.54, respectively).

Conclusion: Proliferation of stem cells increased significantly in the ipsilateral striatum in early period after stroke, but this increase subsided subsequently. However, the lack of change in expression of DCX reveals that the proliferating neural stem cells did not differentiate into neurons.


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Background: 'Live-wiring'- therein lies the secret of the adaptability of human brain. Our experiences which form the essence of our lives, from the activities we indulge in, to the thoughts and beliefs we hold, constantly rewire and reshape the minuscule details of this dynamic circuitry. Our brain's wiring is unusually incomplete at birth in comparison to other fellow animals. Instead, our genes act as blueprints for the formation of synaptic connections while the environment fine-tunes these links. The gene is the gun and environment, the trigger. With adolescence being a period of significant cognitive changes, it is imperative to study the effect that external experiences or rather the lack thereof, has, on the intricacies of the neural networks of adolescent brains. Cognitive functions is a collection of abilities and methods involving attention, decision making, alertness, information processing, problem solving and visuospatial skills.

Aims and Objectives:
1. To quantitatively compare 6 cognitive functions—Attention Span, Alertness, Short-Term Working Memory, Executive Function, Visual Scan Speed and Interference-Inhibition, of the gamers (test group) and non-gamers (control group).
2. To quantitatively compare the effect of video games on cognitive functions of male and female gamers.
3. To determine the video game-genre preferences among gamers and its correlation with cognitive
Methodology:

**Study Design:** Employment of standardised tests to gather quantitative data relevant to the study for comparison and statistical analysis

**Study Type:** Cross-sectional Study

**Sample Size:** 100 adolescents (11-19 years of age)

**Inclusion Criteria:**
- 100 healthy adolescent boys and girls (50 control and 50 test group).
- Playing video games for 15-20 hours per week since 2 years.
- IQ range 80-119

**Exclusion Criteria:**
- 1. History of major illness
- 2. History of color blindness
- 3. History of hand injury
- 4. History of learning delays and disorders.

**Result:** The statistical analysis was done by paired t-test for studying the correlation between playing video games and the 6 cognitive functions under observation. According to the t-test, there is positive association between playing video games and 5 cognitive functions – Executive Function, Short Term Working Memory, Alertness, Attention Span, Interference-Inhibition, of adolescents. No significant difference was detected between the groups with respect to their Visual Scan Speed. There was no significant difference between the performance of male and female gamers. It was also found that Strategy genre of video games showed positive correlation with the impact that video games have on the cognitive functions of adolescents.

**Conclusion:** 1. There is significant effect of playing video games on 5 cognitive functions - Executive Function, Short Term Working Memory, Alertness, Attention, Interference-Inhibition, of adolescents. There is no significant effect of playing video games on visuospatial memory of the adolescents. 2. There is no significant difference between the performance of male and female gamers. 3. Strategy genre of video games has a significant effect of the cognitive functions of gamers.

67. **Application of a rare case of solitary brain cyst findings into the case scenario of early clinical exposure (ECE)**

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**Background:** Cerebral cystic is a lesion with fluid-filled sac in the brain, it is maybe benign, or malignant. A cyst may be filled with blood, pus, CSF, etc. A benign tumour is usually restricted to a particular locus of the brain. Cyst may compress the adjacent brain tissues, it will manifest the symptoms like headache, blurred vision, paresthesia, etc. Brain cysts are of various types like arachnoid, colloid, abscess cyst, etc. They may be formed due to infections, injury, or some cysts may arise by birth itself. They can be diagnosed by correlating the clinical findings with the radiological/laboratory reports.

**Case Description:** During the cadaveric dissection of a male aged 70 years in the Department of Anatomy, JSS Medical College, Mysuru, a rare case of brain cyst was noticed in the right cerebral hemisphere, occupying...
the region of occipital pole. It was a fluid-filled semitransparent fluctuating cystic mass bounded by a layer of the connective tissue. The fluid was drained on puncturing, later a piece of cyst wall and brain was subjected for histopathological examination under H & E staining method.

**Conclusion:** The present case findings are used as a base to create a relevant Neuroanatomy case scenario by underscoring the application of preclinical knowledge into the components of early clinical exposure (ECE) for 1st year medical students.

68. **Morphological Variations in A1-segment of Anterior Cerebral Artery**

**Chetana Sharma, Jyoti Chopra, Anita Rani, R.K. Verma**

**Background:** Anterior cerebral artery is small terminal branch of internal carotid artery and exhibits several variations. Hypoplasia/Aplasia of A1-segment is most frequent type of variation and responsible for aneurysm, ischemic stroke and A1-segment hypoplasia syndrome (Right lower limb monoplegia, abulia and urinary incontinence), so it is necessary to study about variants for any surgical approach.

**Aim and Objectives:** To study morphological variations and anomalies of A1-segment of ACA in the Uttar-Pradesh population and compare it with other studies.

**Method:** We studied 42 A1-segment of anterior cerebral arteries from 21 formalin-fixed brains. We observed length, outer-diameter at site of origin, branches and anomalies of A1-segment of ACA.

**Result:** Hypoplasia of A1 segment of ACA was observed in 11.90% cases (right-4.76%, left-7.14%), aplasia in 2.38% (left sided) and accessory A1 segment in 4.76% cases (left sided). Variations observed in ACoA were, agenesis (4.76%), fenestration (4.76%) and H shape (4.76%). Mean length of A1 segment was 17.10+/−3.48mm (right) and 17.04+/−4.1mm (left); outer diameter was 2.49+/−0.53mm (right) and 2.39+/−0.70mm (left).

**Conclusion:** Variations in morphology of A1-segment of ACA in Uttar-Pradesh population is very common. Knowledge of anatomical variation of ACA is mandatory for Radiologist and Neuro-surgeons to minimize morbidity.

69. **Histopathological changes observed in ischemic rat brain.**

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**Background:** Stroke has been ranked the third most common cause of death worldwide. Global ischemia causes widespread brain injury and infarctions in various regions in the brain. Oxidative stress probably plays an important role in the development of tissue damage induced by arterial occlusion with subsequent reperfusion.

Kapikachhu or *Mucunapruriens* which is commonly called as Velvet bean is well-known for its aphrodisiac activities. It is also used in the treatment of snakebites, depressive neurosis and Parkinson’s disease. Although the plant possesses diverse pharmacological actions, the neuroprotective action has got little attention.

**Aim:** To evaluate the neuroprotective effect of *Mucunapruriens* in bilateral carotid artery occlusion induced global cerebral ischemia/reperfusion (I/R) injury-induced oxidative stress in rats.

**Methodology:** Global ischemic brain damage is induced by bilateral common carotid artery (BCCA) occlusion for 30 min, followed by reperfusion for 24hr. on wistar albino rats. The methanolic plant extract is given to the animal 10 days prior to the ischemia. Following decapitation, the brain is observed for
histopathological changes.

**Results:** Cerebral ischemia resulted in significant neurological damage in the brain. There is significant protection of the brain damage is observed in *Mucunapruriens* treated group as compared to negative control group.

**Conclusion:** This study, for the first time, shows potent neuroprotective effect of *Mucunapruriens* against global cerebral I/R-induced oxidative stress in rats, suggesting its therapeutic potential in cerebrovascular diseases (CVD) including stroke.

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70. **Role of genetic abnormalities in early detection of oral carcinoma**

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**Background:** Despite of advances in treatment the mortality rate of oral carcinoma has not changed in recent years, mainly because of late diagnosis and insufficient biomarkers for diagnosis. About half of the cases of oral carcinoma are associated with oral precancerous lesions and predisposing factors such as tobacco, alcohol etc which are in a rising trend. To make early diagnosis of oral cancer on molecular basis, we need a simple yet effective marker. Hence the present study has tried to assess micronucleus as a marker for oral carcinoma.

**Aims and Objectives:** To compare the micronuclei frequencies in cases with history of predisposing factors with those without any history of predisposing factors.

To explore the possibility of using this method as a screening tool for detection of oral carcinoma in population.

**Methods:** The study was conducted in department of dental and oral surgery and department of anatomy Lady Hardinge Medical College and associated Hospitals. A total of 50 participants with history of predisposing factors was taken as study group and 50 participants without any history of predisposing factors as control group which were age and sex matched was included. The data was tabulated and analyzed statistically.

**Results:** In this study out of 50 cases taken tobacco was the most commonly associated risk factor and Micronucleus frequency was significantly higher in cases then control with p value < 0.001.

**Conclusion:** The Micronucleus can be used as a biomarker for early detection of oral carcinoma.

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71. **Central retinal artery: A human fetal cadaveric study with histological correlation**

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**Background:** Optic nerve is a nerve of vision. It is supplied by the Central retinal artery. This artery starts getting incorporated within the optic nerve at around the sixth week and by ninth week it is entirely inside the optic nerve.

**Aims and Objectives:** The present study aimed at identifying the location of the central retinal artery inside the optic nerve – peripheral or central position.

**Methods:** Twenty-five spontaneously aborted human fetuses of second and third trimester were dissected to expose the optic nerve. The morphometric measurements (length and thickness)of the optic nerve were taken. The central retinal artery was identified. Transverse sections were taken and subjected for histological procedure.

**Results:** The length of optic nerve increased in the 3¹st trimester. The optic nerve was thick at the posterior
pole of the eyeball. The results showed that the central retinal artery, at its entry into the optic nerve, was peripheral and inferior in three optic nerves and peripheral and lateral in the remaining optic nerves. However, the artery was centrally placed, close to the posterior pole of the eyeball. The histological findings confirmed that the central retinal artery entered the optic nerve in the middle of the intraorbital part. At its point of entry, the central retinal artery lied peripheral and inferior in three optic nerves and peripheral and lateral in forty-seven optic nerves.

Conclusions: These findings are important for the ophthalmologist in identifying certain congenital anomalies of the eyeball in the neonates.

72. Comparative study of stress markers on pyrethroid & herbal treated lungs of albino rats with their withdrawal effect and its correlation with immunity

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Introduction: Mosquito borne diseases are very common worldwide problem. To avoid it, pyrethroid and herbal based mosquito repellents are frequently used in society. Still there are limited literatures shown the effect of mosquito repellents on immune response.

Aims & Objectives: To evaluate biochemical stress markers & withdrawal effect of mosquito repellants before and after the study.

Materials and Methods: 26 male albino rats weighing 120-180 grams were obtained from IITR, Lucknow, UP. These rats were further categorized as unexposed group i.e. 0- control, pyrethroid exposed group- IA and its withdrawal group-IB, herbal exposed group-IIA and its withdrawal group-IIB. Exposures were given for 12 weeks, whereas to see reversibility in withdrawal groups (IB and IIB), rats were kept for further 4 weeks after completion of exposure. Daily 8 hours exposure of mosquito vaporizer fumes was given for 12 weeks. Ethical clearance was obtained from Animal Institutional Ethical Committee, KGMU, Lucknow. Statistical analysis was done by using ANOVA and Tukey HSD tests.

Result: During study and at the end of experiment, statistically significant differences were found between control and exposure groups. Biochemical marker assessment revealed that at the end of study lipid peroxidase (LPO) or malondialdehyde (MDA), a marker of oxidative stress was significantly increased in lung tissue homogenate of pyrethroid exposed group (IA) followed by herbal exposed group (IIA). In withdrawal groups (IB and IIB) LPO level were found to be partially reversible.

Conclusion: Reactive oxygen species (ROS) & the oxidative damage are thought to play an important role in many human diseases including cancer. Thus establishing their precise role requires the ability to measure ROS accurately. In present study, we found max oxidative damage in pyrethroid exposed group (IA) followed by its withdrawal (IB). While the reversal changes were improved more in herbal withdrawal group than pyrethroid withdrawal group.
73. Tuberous sclerosis with multiple rhabdomyoma- An interesting case

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Background: Tuberous sclerosis complex (TSC) is an autosomal dominant disease with variable presentations. It is featured by tuberose deposits in various organ systems. Hence it presents with spectrum of clinical features mainly involving heart, lung, CNS and skin. Cardiac involvement is marked by the presence of multiple rhabdomyomas and in some cases arrhythmias. In the absence of symptoms, rhabdomyomas require no specific treatment. However, cardiac arrhythmias are unpredictable and may be the cause of sudden cardiac death in some cases. Here we are reporting a case of tuberous sclerosis.

Case description: A 4-months old female child presented with history of recurring episodes of convulsions for one month and increasing frequency since morning. On physical examination child had normal developmental milestones for the age had normal vital parameters. The child had multiple hypomelanotic macules over the face, hands, and legs. Systemic examination was unremarkable.

Conclusions: Tuberous sclerosis is a multisystem genetic disorder, with a significant number of patients showing cardiac involvement. Cardiac involvement is mostly in the form of rhabdomyomas and fatal arrhythmias. Hence early diagnosis with proper treatment has better outcomes. Genetic counselling can reduce mortality significantly since it carries 50% of risk of transmission to offspring. Also, the prenatal testing and counselling are of promising preventive measures in the affected family.

74. Variations in microanatomy of skin of palm and sole in humans; Gender differences

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Introduction: Accurate values of thickness of epidermis of skin and its variation with body site, age and sex are important in the fields of medical and biological research. Variations in skin reaction to certain stimuli could be due to biological factors such as the epidermal thickness, dermal thickness, distribution of epidermal appendages etc.

Material and Methods: Skin was procured from palm and sole of six freshly embalmed human cadavers. Out of these three were males and three were females. Age of the male and female cadavers ranged between 60 to 70 years (mean age 67 years). Skin samples measuring 1cm (L) X 0.5cm (B) were taken from center of palm. Tissue was preserved in 10% formaldehyde for 48 hours and further histological techniques were followed.

Result: In sole thickness of epidermis (Edp) were observed (866.07±22.20µm), (562.10±24.91µm), thickness of stratum corneum (470.43±21.68µm), (484.36±49.21µm), depth of rete pegs (62.89±5.96µm) (103.04±18.95µm) in female and male respectively. In palm thickness of epidermis (Edp) were observed (404.43±23.41µm) (296.63±107.03µm) thickness of stratum corneum (330±32.83µm) (112.20±63.92µm), depth of rete pegs (195.78±18.05µm) (104.56±15.28µm) in female and male respectively.

Conclusion: Despite of the fact that subjects from both sexes belonged to the same age group, clear and statistically significant histological differences were observed in the skin of palm and sole.
75. Shah-Waardenburg Syndrome type IV; A Case Report

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Background: The Waardenburg syndrome (WS) is a neurocristopathy which is caused by the arrested migration of neural crest cells. Its overall incidence of 1 in 40,000-50,000 live births. It is an autosomal dominant disorder manifesting with sensorineural deafness, pigmentation defects of the skin, hair and iris and various defects of neural crest-derived tissues. Shah-Waardenburg syndrome (type-IV WS, SWS) is associated with Hirschsprung's disease. The presentation is usually in the neonatal period with delayed passage of meconium (beyond 48 h) or with features of neonatal small bowel obstruction or constipation since birth although cases presenting beyond the neonatal period have been reported.

Case report: A three-day old male baby was brought with history of vomiting since birth, not passed meconium since birth, abdominal distension for two days and jaundice for one day. On examination baby was stable, not sick looking and vitals were with in normal limits. Anterior fontanelle open, White Forelock Present. Depressed nasal bridge present. Increased intercanthal distance and heterochromia of iris present. Abdominal X-ray: multiple fluid levels present. USG-Abdomen showed distal small bowel obstruction. A clinical diagnosis of Shah-Waardenburg syndrome or Waardenburg syndrome type 4 was made and treated.

Conclusion: Clinical features of Waardenburg syndrome are variable. Paediatricians and paediatric surgeons should have high index of suspicion for SWS in any case of WS presenting with neonatal intestinal obstruction or constipation since birth. A higher morbidity and mortality are documented in these babies thus, early intervention is essential to prevent the inevitable fulminant enterocolitis and sepsis.

76. Assessment of microarray for evaluation of Tetrasomy 9p.

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Background: Tetrasomy 9p syndrome is a clinically diagnosable very rare cytogenetic disorder characterized by tetrasomy 9p associated with a distinctive pattern of multiple congenital anomalies including severe intellectual disability, growth delays such as subnormal cognitive and physical developments, hypertelorism, abnormal ears, microretrognathia and bulbous nose being the most common dysmorphic traits. Microcephaly, growth retardation, joint dislocation, scoliosis, cardiac and renal anomalies are other traits observed in such cases.

Aims & Objectives: The aim of the present study is to describe the chromosomal abnormality observed in a case with polyhydramnios, hydrocephalus with cleft palate and hypoplastic nasal bone finding by USG referred to our genetic laboratory for evaluation.

Material & Method: In this case, we performed karyotype & microarray analysis from amniotic fluid. Karyotyping on amniotic fluid was performed using a long-term culture method followed by GTG banding. Slides analysis was performed by using Cytovision software. Microarray analysis was performed by using Affymetrix CytoScan 750K Array and ChAS software suite.

Conclusion: Both karyotyping and chromosomal microarray analysis showed consistent result of tetraploidy for 9p. Microarray analysis provides significantly more information related with microdeletions as compared to traditional cytogenetic techniques and hence enables a clear causality and provides information that allows for an informed decision making and counseling in prenatal cases with high-risk pregnancies abnormal
ultrasound findings etc. Although Tetrasomy can be easily diagnosed using karyotyping as well.

77. Clinical Significance of Cytogenetics in Multiple Myeloma and Chronic Lymphocytic Leukemia
(Red Review Literature)

Suresh Prajapati, Brijesh Kumar, Tara Nath, Neelam Deshmukh, Priti Kumari

Aim: Evaluate and establish the clinical significance of cytogenetics in cases of Multiple Myeloma (MM) and Chronic Lymphocytic Leukemia (CLL)

Material and Methods: We have reviewed the literature featuring cases of Multiple Myeloma and Chronic Lymphocytic Leukemia with a focus on cytogenetic studies.

Results: It was observed that conventional cytogenetics is commonly used in the study of chromosomal abnormalities in all hematological malignancies. Chromosomal Abnormalities (CA) were detected in more than 50% of cases, the most frequent being trisomy 12, 14q+, and t(11;14). In contrast, interphase Fluorescence In Situ Hybridization (FISH) allowed the detection of Chromosomal abnormalities in more than 82% of CLL patients, with abnormalities of chromosomes 12, 13, and 11 being the most common.

Summary: The clinical importance of cytogenetic analysis in MM and CLL is well established as it enables the detection of exact chromosomal abnormality which further enables better characterization of the disorder, disease progression and prognosis for the patient. It has been observed that majority of patients with MM and CLL display clonal CAs. FISH technique has enabled the detection of genetic abnormalities in plasma cells from the majority of patients in MM, even early course of the disease.

78. The cytogenetic & clinical implications of a ring chromosome 9

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Background: Ring chromosome are rare genetic abnormalities resulting from breakage and subsequent fusion of both end segments of the chromosome. It occurs in about 1/50,000 cases. Based on the integrity of genetic material there are two types - one is a complete ring without any loss of genetic material and other type is incomplete ring showing distal or interstitial deletions and duplications.

Aims & Objectives: The aim of the present study was to identify and characterize the chromosomal abnormality in a 11-year-old girl who showed dysmorphic features & seizure behavior and was referred to our genetic laboratory for evaluation.

Materials & Methods: Peripheral blood used for phytohaemagglutinin stimulated lymphocyte blood culture. Chromosomal analysis of this cases was carried out by using standard GTG banding procedure.

Conclusion: Patients with ring chromosome 9 often share a-typical features of the 9p-syndrome as well as some features seen in the less frequent deletion of 9q. Clinical features included developmental delay, hearing loss, seizure disorder, bushy eyebrows and other dysmorphic features. The application of the combined cytogenetic methods like Microarrays and FISH helped in the systematic characterization of the ring chromosome. The accurate characterization of the ring chromosome helps in the identification of chromosomal gene content or any other imbalances in the genome.
79. Mosaic Turner syndrome: a rare case with three different cell lineages.

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**Background:** Stature is a polygenic trait and often associated with X chromosome anomalies, due to involvement of the gene- SHOX. Turner syndrome is most commonly associated with short stature, which can be a structural or numerical anomaly, like a monosomy, isochromosome, ring chromosome or a mosaic, with various cell lines.

In recent years, various therapeutic advances, including administration of Growth hormone at a young age, can reduce the disabilities significantly.

**Methods:** Peripheral blood sample was collected. Standard G-banding Karyotyping was performed at Genetic Laboratory, Dept. Of Anatomy, Govt. Medical college, Kozhikode. A total of 60 cells were studied and reported.

**Case Description:** A 6 year old female child was brought to the local OP by her mother, with complaint of short height. She does fairly well in her academics and performs day to day activities independently. On examination her height was recorded as 98.5cm, corresponding to bone age of 3 years. No other obvious external anomalies were noted. She was advised to undergo routine investigations and Karyotyping.

Mosaic Turner syndrome was reported: mos 45,X[33]/ 46,X,der(X)add(X)(p22.3)[19]/ 47,X,der(X)add(X)(p22.3)der(X)add(X)(p22.3)[8]

**CONCLUSIONS:** The cytogenetic analysis of such a variant of mosaic emphasises the importance of prompt and accurate detection for planning a multidisciplinary approach in these cases.

80. Amniotic band sequence with craniofacial involvement: a case report

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**Background:** Amniotic band syndrome is a rare congenital disorder caused by entrapment of fetal parts by fibrotic amniotic bands in utero. It is a sporadic condition of unclear etiology with an incidence of approximately 1:1200 to 1:15000 live births. It causes a variety of fetal malformations involving the limbs, craniofacial region and trunk. The congenital anomalies in this syndrome vary widely and defects may be isolated or multiple and do not follow a specific pattern.

**Case Description:** In the present case, a male fetus weighing 200g (16 weeks of age), with attached umbilical cord was received. External examination of the fetus revealed right side anophthalmia, exencephaly on the left side (correlated with MRI), cleft lip with cleft palate, low set ears, malformed and fused fingers in both hands, constriction ring on left little finger and left leg, fused and malformed toes in right foot, club foot on the right side. Internalexamination and radiological investigations (MRI and X-RAY) were also done.

**Conclusion:** Recognition of amniotic bands is important, as many bands regardless of the etiology was found to be potentially harmful. This case is presented with an intention to understand the etiology and pathogenesis of this condition as well as to heighten the awareness of the amniotic band syndrome, which has implications for genetic counselling for early detection and diagnosis.
81. Caudal regression syndrome – a case report

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Background: Caudal Regression Syndrome (CRS) is a rare complex disorder of distal spinal segments. There are wide range of anomalies included in this syndrome like partial agenesis of spinal cord, pelvic malformations, imperforate anus, genital malformations, cardiac anomalies, bilateral renal dysplasia or aplasia, pulmonary hypoplasia. This paper aims at reporting a case of caudal regression syndrome with its embryological and genetic correlations.

Methods: A one-month old female child diagnosed antenatal with caudal regression syndrome, presented in a tertiary hospital for the treatment of her respiratory illness. The diagnosis was done prenatally during routine antenatal screening. Routine investigations and plain X rays of pelvis with both hips were taken. The patient was counselled for the prognosis.

Case description: The antero-posterior radiography showed the ‘sitting Buddha-like position’ which was the result of flexion-abduction of the hip joints, flexion of the knees and equino varus deformity. The sacrum was absent.

Conclusion: The embryological basis of this varied clinical presentation is discussed in the poster.

82. Bilateral Absent Posterior Communicating Arteries - A Case Report

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Background: The circle of Willis represents a vascular network located at the base of the skull in the interpeduncular fossa. In the posterior part, the basilar artery separates into the right and left posterior cerebral arteries, and their connection to the ipsilateral internal carotid artery is provided via a posterior communicating artery. The posterior communicating artery functions as a collateral channel for maintaining the blood flow.

Case discussion: A sixty seven year old male patient presented to the casualty of a tertiary care hospital with a history of giddiness & weakness in left upper & lower extremities. Patient is a known diabetic under treatment since 20 years. Neurological examination revealed left hemiparesis. Contrast MRI brain revealed bilateral absent posterior communicating arteries. Here we review various theories regarding its embryological basis and discuss the presentation, diagnosis, and treatment of this case of bilateral absent posterior communicating arteries.

Conclusion: PCoAs absence is a congenital variant of Willis circle and it is known that it becomes symptomatic when associated with internal carotid artery stenosis. However, some evidences suggest that PCoA hypoplasia per se predisposes to thalamic lacunar stroke because of the critical role of PCoA in the collateral supply of proximal PCA territory. Thus, it is suggested that the occurrence of the anatomic variant might have led to a hemodynamic infarction due to a poor regional collateral flow.

83. Chromosomal anomalies in anorectal malformation patients – a cytogenetic study

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King George’s Medical University, U.P, Lucknow

Background: Anorectal malformations are congenital malformations of the digestive system resulting from disturbed development of the hindgut during embryogenesis, involves both sexes. Association of Downs with anorectal malformation is very well documented. Objective- present study was done to study association of trisomy 21 with anorectal malformation patients.

Methods: 48 patients of anorectal malformation were selected from Department of Paediatric Surgery, KGMU-U.P, Lucknow. Blood samples were collected and their cytogenetic study was done in the Department of Anatomy, KGMU-U.P, Lucknow. Karyotypes obtained were further analysed.

Results: Out of 48 children enrolled in the study, karyogram could be obtained for 45 cases (93.75%). Trisomy 21 was found in 3 cases (6.7%) out of 45 karyotypes in which 2 were males and one female.

Conclusions: Incidence of trisomy 21 was found in 6.7% cases of ARM which emphasizes the need for a thorough investigation of patients with ARM.

84. Balanced translocations in Recurrent pregnancy loss, by Cytogenetics

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Background: About 15% to 20% of pregnancies end in spontaneous abortion, mostly in the first trimester. At least 50% of clinical abortions result from chromosomal abnormalities. Chromosomal translocation in either parent is the most common structural rearrangement involved in spontaneous abortions.

Aims & Objectives: The aim was to identify chromosome abnormality as an etiological factor in couples with recurrent pregnancy loss (RPL).

Material & Methods: Peripheral blood lymphocyte cultures and G banding was done as per the routine protocol.

Result: We describe 2 cases of balanced translocation carriers observed in my study with indications of recurrent pregnancy loss.

Case1: The karyotype of the husband was normal (46,XY) and the wife had a reciprocal translocation involving chromosome 14 and 21, with karyotype 45,XX,rob(14;21)(q10;q10).

Case2: The karyotype of the husband was normal (46,XY) and the wife showed a reciprocal translocation with karyotype 46,XX,t(3;10)(p10;p10).

Conclusion: The identification of balanced chromosomal rearrangement in a parent is useful because it provides not only an explanation for the miscarriages, but also information about the future pregnancies. Genetic counseling should be provided to such couples, which includes and explanation of the findings, risk for miscarriages and live birth with congenital anomalies and a discussion of reproductive options (IVF and PGS/PGD), including prenatal diagnosis. hence, in cases of RPL, cytogenetic examination of both partners should be routinely done.

85. Luminal Cast Plastination of the Human Anatomical Specimens

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Background: Luminal corrosion cast technique is useful to study the dimensions and architecture of different
cavities of organs and to study the tubular pattern of arterial, venous, various duct branches. The corrosion cast luminal plastinates yielded durable, odorless and pleasant to handle it. Luminal cast plastination using silicone gel is one of the methods of plastination to obtain the negative replica or mould of a tubular structure. The principle involves the filling up of the lumen with the material and dissolving the surrounding tissue.

**Aims and Objectives:** To create luminal cast plastinates of various human anatomical specimens and to assess the durability of the plastinated specimens.

**Methods:** Materials used for plastination were silicon gel, silicon gun and dissection box. The organs selected for plastination were cerebrum, brain stem, cerebellum, lung with trachea, arch of aorta, common iliac artery with its two divisions and renal artery. Plastination was completed in four steps. The steps were fixation, dehydration, impregnation and hardening. Silicon gel was used for impregnation.

**Results:** The luminal cast plastinated specimen of tracheobronchial part of lungs, renal artery, arch of aorta with branches, brain and internal iliac artery were made.

**Conclusion:** Plastination is a strong preservation method when compared to several others methods such as formalin. It is also used to create samples for demonstration purposes. It is hence, endorsed in various departments for conservation of specimen.

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86. **Students’ Perception on Benefits and Pitfalls of Teaching Embryology to Medical Students and Possible Remedial Measures for its Betterment**

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**Background:** Embryology is an integral part of basic science teaching in the medical curriculum. Its learning outcomes are widely applied in various fields of Medicine. However, it is still an area which is often ignored/overlooked by the students. Students often find embryology learning difficult.

**Aim and Objectives:** The present study was conducted to evaluate and understand the perception of first year medical undergraduate students regarding embryology teaching/learning.

**Methods:** The present cross-sectional study involved 250 first year medical undergraduate students of batch 2019. The students were provided with a semi-structured questionnaire that addressed embryology teaching (general understanding and practices of embryology teaching). The responses were recorded using a Likert’s scale. It also included an open-ended question wherein students were encouraged to express their opinion on teaching/learning embryology.

**Results:** Majority (68.8%) of the students opined that current syllabus of embryology is relevant for acquiring knowledge. They (76.1%) also stated that human embryology is essential in understanding gross anatomy and clinical ailments. Lecture class with models/videos (73.1%) was voted as the best method to learn embryology. Students (74.8%) also opined that small group teaching is required to understand embryology.

**Conclusions:** The present study indicates that there is a need to reform the existing method of teaching embryology to enhance student learning. We understand that students need more hours of embryology teaching in the form of lectures and small group teaching. Further, the use of clay models (3D) and videos are need of the hour facilitate the better understanding of the embryology.
87. Students’ perspective on online Anatomy learning: A cross sectional study

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Objective: To analyze the challenges faced by the students in online learning of anatomy and assess the possibility of integration of technology and hands on experience using a questionnaire.

Methodology: We conducted a cross sectional study at Jawaharlal Nehru Medical College & Hospital, Aligarh by using a questionnaire with closed items.

The study group contained 100 students of first year who had to study anatomy online were randomly selected.

The control group contained 100 students of second year who had hands-on experience with cadavers and specimens to study anatomy.

Result: The study group was found to have difficulty in grasping concepts and elements of anatomy without hands-on experience as compared to the control group who had full access to cadavers and classroom discussions as well as videos and online lectures. The study group also lacked concentration, work-place satisfaction and creativity during online learning as compared to the control group. The study group also had difficulty in accessing high speed internet for online learning.

Appropriate statistical test was applied and p value was found to be less than 0.05 thereby results were significant.

Conclusion: The study confirms that only online learning can not make efficient Indian Medical Graduates. However integration of online learning with classroom discussion and hands-on practice with cadavers can evolve learning experience of students for better perception of human anatomy.

88. Covid-19 pandemic – Teaching and assessment through virtual anatomy

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Background: With the beginning of the pandemic COVID 19 since March 2020, the medical education in India has experienced a major disruptive change as a consequence. Due to the nation-wide lockdown, measures to prevent spread and hence to ensure social distancing have led to the closure of all educational institutes including medical schools and have compelled everyone to work from home for both medical teachers and students. Almost all undergraduate students of medical colleges are relocated to their homes, leaving their hostels just before the beginning of lockdown, of local, interstate, and international travel.

Aims and objectives: To compare online teaching and assessment methods with traditional method.

Methods: Students of first MBBS were exposed to both methods of assessment and their result and feedback was compared.

Results: It was found that students were more comfortable with traditional teaching and assessment methodology.

Conclusion: Virtual anatomy cannot replace dissection and online assessment cannot replace traditional methods.
89. To study the impact of Basic Clinical Skill Training Programme On Learning Of First Year MBBS Students

Mumal Nagwani
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Background: The effect of clinical skill laboratory training is widely recognized. Despite the fact that bedside teaching has always been deemed an indispensable and valuable method of teaching, its role is declining in medical schools.

Practicing on real patients is a problematic ethical issue, particularly where it involves the training of invasive procedures. Basic clinical skills acquisition on wards occurs in a rather “haphazard” fashion and frequencies of performance of such skills differ widely among students.

Aim and Objectives: Aim of the study is to bridge the gap between expectations and actual learning experiences on the wards and to see the effectiveness of the “proficiency-based” teaching interventions of skills training sessions using simulators on first year MBBS students.

Material and Methods: Study has been carried out on 90 students. This research study used a pre-test/ post-test design with three measurement times to evaluate the gain in knowledge and competency in intramuscular (IM) injection skill in Deltoid region in Skill Lab settings on manikins. Subjects underwent practice sessions also. A task-specific checklist was used to collect data at all three time points. Evaluation system was mainly MCQs and OSCE based on checklists prepared for the scenarios.

Results: The mean± S.D. for pre-test scores was 8.60±2.280 and the same value for post-test scores was 14.24±0.933. The p-value is highly significant showing a clear cut benefit to the students.

Conclusion: A significant gain in knowledge was observed.

90. Transport Embalming in SMS Medical College, Jaipur

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Introduction & Objectives: Transport embalming is required for transportation of dead bodies to delay decomposition. The preferred place for the cremation of dead body is the native place and whenever death occurs across the state or nation, embalming becomes necessary. In this poster, transport embalming services provided by SMS Medical College, Jaipur is depicted through a flow chart for public awareness.

Methodology & Result: In the form of flow chart.

Conclusion: Knowledge of transport embalming services is useful to make easier the final passage of loved one, because transportation of dead body is a daunting task especially for relatives with an influx of emotions and because of legal aspects.

91. Thiel soft embalming method.

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Background: Cadaver Preserved with the thiel method have no detectable odor, a life like flexibility of body parts, excellent color preservation of muscle, viscera and vasculature, superior antimicrobial preservation properties.

Aim and Objectives
Aim-To demonstrate thiel method of soft embalming in form of flow chart for social awareness.

Objective-To demonstrate that soft embalming method has more advantages than routine conventional method of embalming.

Methodology & Results: In form of flow chart.

Conclusion: Soft embalming method has more advantages than routine conventional method of embalming because of more lifelike texture and color of structures. Dissection is of high quality, improving learning in the laboratory, also helpful in learning clinical procedures such as intubation, lumbar puncture, central line placement, thoracocentesis and surgery.

92. A review on approaches of anatomy learning and future prospects.

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Background: During the lockdown, we were forced to use unconventional methods to study anatomy i.e. without cadaver and specimens. Which led me to think of the ways in which anatomy learning has changed since the times of Herophilus and Erasistratus. The review article particularly emphasizes on how these evolving perspectives can lead us to wield better tools for anatomy learning in the future by incorporating the conventional and unconventional ways.

Objective: To review the methodologies used in the past for anatomy learning and analyze the future perspectives for aforementioned.

Methods: An extensive study of articles from pubmed and ncbi on the history of study of anatomy and medical curriculum for anatomy learning was done to write the review article.

Result: It was observed that study of human anatomy has always had an important part in medical science. It is recent that human bodies are procured through donations to medical schools. Medical curriculum has widely evolved and now students have access to dissection as well as online learning portals.

Conclusions: Cadaveric dissection is now legal but technology is another readily available resource to learn without the burdenation of conventional resources and ethical issues.

93. Impact of an online awareness session on the knowledge and attitude of social welfare professionals towards Voluntary Body Donation

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Background: Cadaveric dissection enables the students to locate the topographic arrangement of the organs within the body of an individual. Cadavers also hold an important place in practicing surgical skills and surgical techniques. Voluntary body donation is of utmost importance to facilitate anatomy pedagogy. However, the number of individuals opting for voluntary body donation varies with the individual’s awareness and attitude towards it.

Aim and Objective: To create and assess the mindfulness on voluntary body donation among the social welfare professionals and students.

Methods: This cross-sectional interventional study included undergraduates, postgraduates, faculty and certified social welfare professionals from several institutes in South India. Educational intervention in the
A form of an interactive session using an online platform was organized. Semi-structured pre and post questionnaires were designed to assess the awareness of voluntary body donation.

**Results:** It was found that most of the respondents had knowledge of the term anatomy and body donation. However, they weren’t sure of the purpose of cadavers in medical institutions, laws governing them and the procedure involved in body donation. General perception, knowledge and attitude regarding body donation significantly improved among the study population after the webinar. **Conclusion:** Awareness talks among social welfare professionals and students are useful in spreading the knowledge reading the importance of body donation.

94. **The impact of COVID-19 pandemic on anatomy teaching**

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**Background:** Remote teaching was adopted by many countries upon the declaration of COVID-19 a pandemic by the World Health Organization on March 11th, 2020. Like many universities around the world, Sultan Qaboos University in the Sultanate of Oman shifted to Emergency Remote Teaching (ERT) as a measure to contain the spread of the virus. Anatomy courses were shifted to be completely taught online.

**Aims and Objectives:** We aimed to explore students’ perspective about the impact of COVID-19 pandemic on anatomy learning.

**Methods:** Students enrolled in anatomy courses during spring 2020 semester were asked to fill a questionnaire.

**Results:** Results indicated that coronavirus pandemic was disruptive to students’ anatomy learning. Fulfilling courses requirements, home environment, internet connection and the anatomy knowledge were their main concerns. The reliability of internet connection was a major factor affecting their way of studying anatomy and their selection of learning resources. Social media platforms were helpful in assisting students for their study and communication between themselves and their instructors. Assessment and practical part teaching were not well satisfactory to the students and they urge improvement. It is suggested that more effort should to be given for the replacement of 3D and cadavers exposure by online resources and synchronous teaching.

**Conclusion:** Collaboration between different sectors including the teaching institutes, telecommunication companies, administration sectors is mandatory for better online education in the coming semesters. Good transition to remote teaching despite the challenges is a good indicator that online learning should be adapted and incorporated in the anatomy teaching even in normal situations.

95. **Awareness, Attitudes and Practices of COVID-19 among the General Population of Sitapur District, Uttar Pradesh**

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**Introduction:** A survey of awareness, attitudes and practices of COVID-19 were done on people of Sitapur district of Uttar Pradesh, India. Few questions related to COVID-19 were asked to each participant. The data were collected analyzed and presented statistically.

**Aim:** The aim of this study was to find the awareness, attitudes and practices of COVID-19 taken by the
people of Sitapur district of Uttar Pradesh.

**Materials and Methods:** This cross-sectional study was conducted on 500 people with irrespective of sex and age. The participants were asked questionnaires verbally. The study was conducted in three months. The sample size of 500 participants was collected by simple random sampling.

**Results:** In this study, we found that only 17% of people were using mask. During the field visit of this study, it was observed that people were not maintaining social distancing. It was also found that only 19% of people do frequent hand washing. Aarogya setu mobile app users were found to be only 22%. People were not following the protocol of COVID-19 prevention.

**Conclusion:** Many of the people were aware of COVID-19 but the hygienic practices of people towards COVID-19 were found to be very low.
Thank You