

males. It was found to be 0.27 in right mandibular canine; and 0.27 in left mandibular canine among females.

Sexual dimorphism for right mandibular canine was calculated as 7.954%; and for left canine, it was 8.891%.

Conclusion: From my study it can be concluded that diagnostic efficacy of mandibular canine index and sexual dimorphism method is important for sexual dimorphism, by these methods we can easily determined the role of mandibular canines in sexual dimorphism the relevant values always higher in males as compare in females.

Conflicts of interest

The authors have none to declare.

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Age estimation from epiphyseal union degrees of medial end of clavicle



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Introduction: Age estimation in cadavers, human remains and living individuals is important because it clarifies issues with significant legal and social ramifications. Clavicle displays longest growth period as compared to any other long bone in the body and the fusion of medial epiphyseal cartilage of clavicle has proved to be useful in estimating the skeletal age in young adults.

Materials and methods: The present study was done in the Department of Anatomy in collaboration with the Department of Forensic Medicine, Pt. B.D. Sharma PGIMS, and Rohtak. 50 pairs of autopsied clavicles of age group 18–28 years were retrieved. The bones were cleaned and dried. Epiphyseal union was analysed in terms of 4 stages: (1) non-union, (2) beginning of union, (3) active union, and (4) complete union.

Results: In both the sexes, when union is in stage 1, the age was certainly estimated to be less than 18 years old and in stage 4, it was more than 23 years old. The minimum age of beginning of fusion was 21 years in females and 18 years in males. The minimum age of complete union was 23 years in females and 24 years in males.

Conclusion: In females, the union of medial epiphyseal cartilage of clavicle appears to proceed faster in comparison to males.

Conflicts of interest

The authors have none to declare.

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Porta hepatis in normal liver



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Introduction: Hepatic surgery requires comprehensive knowledge of structures passing through porta hepatis. This fact prompted us to undertake the study of porta hepatis. Our aim was to find out the dimensions and shape of porta hepatis and the numerical variations of structures passing through it.

Material and methods: This study was carried out on 25 adult cadaveric formalin preserved human liver. The porta hepatis was identified and its transverse diameter, maximum anteroposterior diameter, various parts of liver contributing in its formation and total circumference were measured using Digital Sliding Vernier Caliper, thread and scale. Number of arteries, veins and ducts passing through it were observed.

Observations: The mean transverse diameter, anteroposterior diameter and total circumference of porta hepatis was 3.80 ± 1.03 cm, 1.79 ± 0.43 cm and 13.61 ± 1.92 cm respectively. Maximum contribution to the circumference was by caudate process (2.26 ± 0.83 cm) and minimum by fossa for gall bladder (1.56 ± 0.42 cm). 32% (maximum) cases showed presence of 2 arteries, 1 vein and 1 duct at porta hepatis. Maximum number of arteries, veins and ducts passing through it were 5 (4% cases), 3 (4%) and 3 (4%) respectively. In most of the cases the shape of porta hepatis was triangular.

Conclusion: From the above study we conclude that dimensions and shape of porta hepatis; arrangement and number of structures at it is highly variable and hence its knowledge can be of great importance to hepatobiliary surgeons.

Conflicts of interest

The author has none to declare.

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A study of diaphyseal nutrient foramina in human tibia



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Introduction: The nutrient artery is the major source of blood supply to the long bones. It enters through a nutrient foramen which runs obliquely and usually directed away from the growing end. The nutrient artery of tibia is the largest nutrient artery of the body. The knowledge of presence, number, location and direction of nutrient foramen has clinical significance in orthopaedic procedures. The present study analysed the presence, number, location and direction of nutrient foramina in 100 dry tibia bones taken from Department of Anatomy, RIMS.

Materials and methods: The present study was conducted on 100 dry adult tibia bones (49 right, 51 left) of unknown sex and origin from the Department of Anatomy, Regional Institute of Medical Sciences, Imphal, Manipur. The lengths of tibia were measured using an osteometric board. For the purpose of study, the tibia was divided into three equal segments. The presence, number, location and direction of nutrient foramen were noted.

Results: The nutrient foramen was located in upper third of tibia in 67.3%, in middle third in 32.7% of tibia and no nutrient were found in lower third. Out of 100 bones, 91% of tibia has single foramina, 8% has double nutrient foramina and 1% has triple nutrient foramina. Most of the nutrient foramina was located on the posterior surface (96.3%) compared to medial and anterior surfaces. Out of 110 nutrient foramina, 3 were seen directing towards proximal end (defying ossification law).

Conclusion: The study will provide the essential data for nutrient foramen which will be helpful in surgical orthopaedic procedures.

Conflicts of interest

The authors have none to declare.

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The morphometry of patella

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Background: Patella is the largest sesamoid bone in the body which develops from the tendon of the quadriceps femoris muscle. It is important anthropometrically as well as pathologically because it is one of the parts like distal end of femur, proximal end of tibia and bones of ankle which are concerned in various method of sitting and squatting and withstand continuous stress and strain exerted by body in standing, walking and running. The paucity of morphometric study on patella of any population or group of Gujarat prompted the present study.

Material and methods: The present study was conducted on 81 patellae obtained from department of anatomy, Baroda medical college. The morphometric parameters like length, width, thickness, articular facets, nonarticular area, and ridge thickness were measured. Distal nonarticular portion of patellae were classified.

Results: The shape pattern of patellar articular facets classified according to Wiberg's classification. The most predominant pattern was type-II with normal nose pattern on both the side. A lateral facet prominence was observed for median ridge and variation in the prominence of secondary ridges which are distinct in 11% cases.

Conclusion: The morphometric data obtained from the patellae are crucial in the diagnosis and development of surgical techniques and often utilized in certain surgical procedures such as patellar resurfacing for total knee arthroplasty. The present study also beneficial for local anthropological records.

Conflicts of interest

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Goniometric study of carrying angle of upper extremity and its correlation with various parameters in western Rajasthan population

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Aims and objectives: The angle formed by the axes of the arm and the axes of forearm when the elbow is fully extended and forearm is supinated that obtuse angle is known as "carrying angle". The present study aimed measure and correlation of carrying angle with various parameters in young males and females.

Materials and methods: The present study includes 200 (100 females and 100 males) healthy students of MBBS from Dr. S.N. Medical College, Jodhpur, were selected and age groups is 18–22 years. Universal goniometer is used for measurement of carrying angle. Bicipital groove, biceps brachii tendon at its insertion and palmaris longus tendon at the wrist were palpated and marked as anatomical landmarks to demarcate the median axes of arm and

forearm respectively. Measurements were documented and statistically analyzed.

Result: The mean carrying angle of male on right limb was 11.80 ± 4.98 and the females was 13.42 ± 6.01 , p -value (<0.003) and the mean carrying angle of male on the left limb was 11.11 ± 5.08 and the female was 13.01 ± 5.97 , p -value (<0.01). We observed the greater carrying angle in dominant limb than the non-dominant limb and mean carrying angle was greater in females than males.

Conclusion: The present study showed that the carrying angle was greater in females than in males and was greater in dominant arm than in non-dominant arm.

Conflicts of interest

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Tyrosine receptor kinase A expression in malignant and benign breast tumors

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Introduction: Breast cancer is one of the major causes of cancer-related deaths in women. The prototype member of the neurotrophin family, i.e. nerve growth factor (NGF), along with its two receptors tyrosine kinase A (TrkA) and p75 neurotrophin (p75NTR) receptors are implicated in number of cancers including breast by various study reports. The TrkA receptor has been indicated to play a significant role in regulation of tumor growth and metastasis, and may serve as potential targets for therapeutic strategies in breast cancer. But studies are scarce on this issue which has examined malignant and benign breast tumors together which may provide clearer view on perceived role of TrkA. The present study was designed to observe and compare TrkA receptor expression in malignant and as well as benign breast tumors.

Materials and methods: Fresh surgically removed tissue from malignant and benign breast tumors specimens were collected from 28 patients reporting to Surgery OPD) and classified in 4 groups (tissues collected from 7 patients per group) for comparison. The receptor expression was assessed by immunohistochemistry (IHC), using the indirect peroxidase method. Normal tumor margins under each category were used as control.

Result: A differential TrkA receptor expression was observed in malignant (maximal) when compared with benign breast tumors, and normal tumor margin (minimal).

Conclusion: Significantly increased expression of TrkA receptor in CA Breast tumors in comparison to benign tumors, and normal tumor margin indicates its potential role in carcinogenesis and warrants for further research on this issue.

Conflicts of interest

The authors have none to declare.

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