ISCAA 2024 | BOOK OF ABSTRACTS

Oral and poster presentations

Oral presentations

Immunotherapy-related colitis and associated anatomical changes in a steroid resistant case

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The use of immune checkpoint inhibitors in treatment of cancer has increased dramatically over the last few years. It poses a groundbreaking approach to cancer treatment. Through immune checkpoint regulation, especially by inhibiting proteins expressed by cancer cells- such as PD-1, PD-L1, and CTLA-4, it enables the patient's immune system to recognise and attack cancer cells more effectively. In doing so, the overstimulation of the immune system can create an excessive inflammatory response which leads to several changes in anatomy and physiology.
It most commonly affects the gastrointestinal tract and predominantly the large bowel. Inflammation of the colon can be assessed early on during presentation with simple imaging with abdominal xrays. The anatomy of the affected bowel shows signs of inflammation, such as thickening of the bowel wall. CT is the imaging modality of choice which reveals colonic inflammation, shown by wall thickening and mucosal hyperenhancement in either a diffuse or localised distribution. The bowel wall oedema leads to increased permeability and ulceration which can be further appreciated through lower GI endoscopy.
This presentation will revolve around a challenging case of steroid-resistant immunotherapy related colitis which was managed at Prince Philip Hospital and will demonstrate key anatomical features of both normal large bowel anatomy from pre-treatment CT staging images as well as the drastic changes resembling toxic megacolon a few months after initiation of treatment.

Key words: Immunotherapy, radiology, endoscopy

John Napier: Tracing the origins of a life's work on the human hand

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John Napier was an influential figure in the field of human evolution and anatomy. He was regarded as a world expert in the evolution and function of the human hand and is perhaps best known for his work on the fossil remains of Homo habilis published in the 1960s. His reconstruction of the hand was used to argue that H. habilis was the earliest human ancestor able to make and use stone tools. He went on to dedicate his life to the study of locomotion, hand function and evolution in humans and other primates. His influence inspired a generation of anthropologists and helped bring human evolution and tool-use to the fore in popular culture.
However, Napier also made several clinical contributions that are not widely recognised. He began his career as a surgeon. Having graduated from St Barts' medical school in 1943, he trained in orthopaedic surgery and worked at Hill End Hospital during World Ward II. It was during this time that he developed a special interest in the anatomy and function of the hand and foot. He published research on peripheral nerve injuries and functional assessments of the foot and ankle joint. His most important work included detailed study of the carpo-metacarpal joint of the thumb which informed his later work on the fossils of H. habilis. His original description of the prehensile movements of the hand includes a classification into 'precision' and 'power' grips that is still widely used in anatomical and clinical texts today.

Key words: hand, surgeon, human evolution, anthropology

The jugular foramen is rather a canal with intervals of differing anatomical implications

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Aim: To assess the morphology of the jugular foramen (JF) bony configuration and redefine this rather long bony passage as a jugular canal (JC) based on its morphometric data.
Methods: The JF was endocranially and exocranially observed and measured by digital Vernier caliper bilaterally in 302 dry skulls with opened cranial cavity. The PARAMETERS: 1) the external and internal width in the mediolateral dimension, 2) the external and internal length in the anteroposterior dimension. 3) the depth between the external plane and the internal plane of the JF. The classification based on appearance: A) The presence of an intrajugular process: No bony bridge, Intrajugular bridge, Intrajugular incomplete bridge. B) Based on the course of the jugular canal: Straight, Curved.
Results: The length of the JC (right-12.2 mm, left-11.88mm) seemed to be symmetrical. The external opening of the JF was found to be slightly larger (13.00mm) than the internal opening (12mm). The size of the JF is rather asymmetrical with a tendency to be larger on the right side. The fibrous bridge connecting the two counterpart intrajugular processes was ossified bilaterally in 33.11% and unilaterally in 36.75% of cases, exhibiting complete to incomplete bridging bony septum.
Conclusions: The JF should be regarded clinically as a canal. It is composed of an internal and external opening where the jugular fossa resides in between. It takes three forms of a straight, semi-curved, and curved canal. The anatomical landmarks of the jugular canal intervals are usual guidance for skull base surgery and imaging navigation.

Key words: Jugular foramen, Jugular canal

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Suprascapular notch cross-sectional area on MRI is not highly accurate in the diagnosis of suprascapular nerve entrapment in comparison to sonography

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Aim: This is a descriptive imaging study of the suprascapular canal MRI and sonographic anatomy with emphases on the difficulty of visualizing the suprascapular notch vicinity. Inaccurate information was encountered through the literature illustrating the suprascapular notch on MRI images. The matter of fact, the orientation of the suprascapular notch does not align with the captured MRI sections. In this study we illustrate more accurate anatomical description of the suprascapular notch and differentiating it form the other segments of the suprascapular canal.
Methods: Forty retrospective MRI of healthy shoulder were collected. The sections were examined and labelled in accordance to our previous cadaveric study describing detailed anatomy of the suprascapular canal. Sonography of the superior shoulder region was bilaterally experimented on ten young healthy (six females and four males) volunteers of age ±21, with prior written consent.
Results: The MRI visualization of the entire suprascapular notch borders at one image was not achieved. The passage of the suprascapular canal was well visible exposing the passing neurovascular bundle. The frontal plane was the optimum to examine the lateral margin of the suprascapular notch. The transverse plane was the optimum to visualize the course of the suprascapular canal.
Conclusions: MRI is a useful modality for screening the surrounding tissues of the suprascapular canal for pathologies, while ultrasound has a greater potential for navigating suprascapular canal intervals because an observer can manipulate the transducer orientation.

Key words: Suprascapular canal, suprascapular notch, suprascapular MRI, suprascapular sonography, suprascapular ultrasound

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Assessing the suitability of AI-generated multiple-choice questions for anatomy

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Objectives: The aim of the present study, was to evaluate the potential of ChatGPT and to determine its capabilities for to generate multiple choice questions in anatomy education of medical students.
Methods: In this study, the questions prepared by ChatGPT-4 with given learning objectives for the 2nd year students of medical faculty who completed the musculoskeletal system module was evaluated by 2 experts and the content validity, discrimination level, difficulty of the questions were scored. And it was asked from the experts to indicate whether the questions were appropriate to be asked in the exam or whether they could be asked with modifications.
Results: In line with the instructions given to it, ChatGPT-4 generated questions that can be used directly in multiple-choice exams of students or can be used by modifying them. However, it was observed that it made some mistakes in the answers produced to the questions that were asked to be prepared on a case-based basis. Some of the answers produced to such questions could be eliminated very easily, some of them were found to contain overlapping information.
Conclusion: Although ChatGPT-4 has some limitations, it seems to be a useful tool for preparing multiple-choice exams in the future. The steps that an instructor thinks writing a good question should be well described in the prompter besides the learning objectives. The level of the questions should be determined according to bloom taxonomy and the difficulty level should be well described. Despite all these guidelines, it seems that ChatGPT-4 cannot completely replace the critical role of educators and should be used as a complementary tool after an expert evaluation. Future research should be made on students to establish ChatGPT's optimal use and application in medical education assessment and evaluation.

Key words: anatomy education; artificial intelligence; ChatGPT; medical education; multiple choice questions

Topographical anatomy of the hypoglossal nerve

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Aim: Continuous positive airway pressure (CPAP) is a commonly used treatment for obstructive sleep apnoea (OSA), a chronic condition caused by periodic collapse of the pharynx during sleep. However, considering the non-compliance of patients and the consequences of untreated sleep apnoea, an alternative treatment method needs to be developed. Indeed, neuromuscular stimulation devices as a novel approach have recently become increasingly popular as an important and life-improving alternative. This study aimed to identify the appropriate site to optimize the implantation of neuromuscular stimulation devices.
Methods: The bilateral hypoglossal nerve (HGN) of eight cadavers was evaluated in the study. The distal branches of each HGN to the hyoglossus, geniohyoid and genioglossus muscles (GG) were examined and localized using a precision digital calliper. Distance from the cervical midline and distance from the symphysis to the mandible were assessed to measure localization. Moreover, anthropometric measurements were performed to assess other factors that may contribute to OSA.
Results: This anatomical study evaluated the location of the HGN and its terminal branches innervating the hyoglossus, geniohyoid, and genioglossus muscles. The appropriate area for positioning neuromuscular stimulation devices and associated risks were evaluated. The appropriate placement of the neuromuscular stimulation device was determined to be 20±2 mm in the midline and 50±6 mm in the symphysis mandible.
Conclusion: OSA, an increasingly prevalent disease, and the standardization of necessary treatment modalities are of vital importance. Drawing from the experiences gained in previous studies, an appropriate area was determined for neuromuscular stimulation devices. This provides a convenient option for patients who are non-compliant with CPAP devices, offering an alternative treatment approach.

Key words: Obstructive sleep apnoea, hypoglossal nerve, genioglossal muscle, neuromuscular stimulation devices

Possibilities for biomechanical modelling of stress on individual anatomical structures of the eye using an improved mathematical model of the human eye

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Aim: The human eye is a complex optical system involving a variety of tissues, from connective to nervous. Implementation of individual layers and structures allows the biomechanical modelling of the istribution of tissue loading during selected loading events and can therefore be used to visualise changes in load and overload during injuries of selectable direction or intensity, as well as changes in the stability of the optical system following surgery or implantation of an artificial lens.
Method: The Abaquus program using finite element method (FEM) was used to create the model and simulate the loading. Additional structures relevant to the stability of the optical system of the eye under physiological conditions, in case of intraocular lens implantation and in case of blunt impact were implemented in the basic eye model.
Results: A model of the eye was created that corresponds significantly better to its anatomical structure. The simulations demonstrated the loading of individual structures in various defined situations and described the risk of their mechanical failure in case of overloading, especially with regard to the time course of selected dynamic processes.
Conclusions: We have verified the possibilities of biomechanical modelling of loaded anatomical structures in different situations. From a clinical point of view, this is important information that can be used not only in the diagnostic but also in the therapeutic process of various eye disorders, from changes due to simple ageing to post-operative changes or changes due to different types of trauma.

Key words: FEM, biomechanical modelling, eye trauma, eye model, IOL

Gamification in anatomy teaching: a systematic review

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Aim: Various gamification platforms, virtual learning software and online learning applications have been recently introduced in the field of anatomy to complement traditional methods. The present study aims to systematically review the literature on the effects of gamification use in anatomy education.
Methods: A systematic review was conducted, in which initially 60 unique articles were found. After the removal of non-eligible and irrelevant studies, 16 studies were included in the current systematic review. MEDLINE, Cochrane, EMBASE and Scopus databases were utilized. Terms relevant to use of gamification in anatomy teaching were used in the search strategy.
Results: The current systematic review includes studies published from 2017 to 2024. The study groups varied in size ranging from 12 to 672 participants. A variety of gamification methods were utilized such as card games, anatomy board games, web-based computer game, virtual reality (VR), bingo. In the included studies implementation of gamification in anatomy teaching demonstrated increased student satisfaction and engagement, games found to be fun and interesting and also the trainees' motivation to learn was increased.
Conclusion: Both digital, such as VR, web-based computer game, and physical, such as card games, board games, bingo) forms of gamification tool have been used in anatomy teaching. The implementation of gamification in anatomy teaching was associated with several positive outcomes.

Key words: anatomy teaching, gamification, systematic review

Left-Sided Inferior Vena Cava – A Case Report

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Introduction: The Inferior vena cava (IVC) is formed by a complex process of embryogenesis during the sixth to tenth week of gestation. The incidence of this congenital anomaly of the cardinal system is approximately 0.2-0.5%, usually being an incidental discovery on Computed Tomography (CT) scans, or likewise during post-mortem dissection. Improper completion of the embryological process may result in four major anatomical abnormalities; duplication of the IVC, retro-aortic left renal vein, circumaortic left renal vein, and transposition or left-sided IVC as discussed in this case study.
Methods: The dissection of a male cadaver specimen (90 years old) revealed a persistent left-sided IVC, with left-lateralisation occurring at the level of renal vein convergence into the IVC. The azygous system, iliac vessels, renal veins, and the left-sided IVC have not shown apparent pathology. Measurements of the IVC diameter are as follows; 34mm at the hepatic junction, maximum measurement of 33.61mm and minimum of 32.35mm upon passing of the aorta, and 39.19 at the point of bifurcation to iliac vessels.
Discussion: Classically, anomalies such as this are picked up on CT scan, it is unknown whether this anatomical variant was recorded previously in medical records. Various surgical challenges are posed by this congenital venous anomaly, for example, cannulation during cardiopulmonary bypass during thoracoabdominal aortic aneurysm repair, and the persistent thrombotic events post IVC filter placement. In this case report, we explore the incidence, pathology and associated surgical and medical challenges that left-sided IVC presents and its clinical implications.

Key words: Left-sided Inferior Vena Cava, Surgical Approaches, Congenital Venous Anomaly

The Effect Of Distance Anatomy Education On Medical Faculty Students After A Natural Disaster

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Unfortunately, the natural disasters experienced in our country have negatively affected the 2022-2023 spring academic year. Distance education has become a very life-saving practice during the Covid-19 infection and ensures that education is not disrupted even if there is an earthquake. During the earthquake disaster in our country, distance education was used to teach anatomy lessons. Of course, distance education has both advantages and disadvantages in anatomy education. While there are still discussions on this issue, distance education links and their use have not completely ended in the world. Distance anatomy education has also opened an alternative door in some fields.

In the study, questions were asked to medical faculty students in the 2022-2023 academic year (Kafkas University, Faculty of Medicine), who were affected by the earthquake disaster and receiving distance education, about teaching the anatomy course prepared with a 5-Likert test through distance education in the earthquake disaster. The answers given by male and female students to each question were analysed using chi-square analysis to examine the p value of each question between the two genders.
In this study, it was aimed to support the importance, impact, advantages and disadvantages of distance anatomy education on natural disasters with student opinions. It is very important to contribute the data obtained to the literature.

Key words: Anatomy education, distance education, Earthquake

Student Opinions On The CT Examination And Comparison Of The Pelvic Organs Of Two Female Cadavers Fixed With Modified Larssen And 10% Formalin Solutions

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Cadaver is the basic building block of anatomy and radiology education. Since it includes a good anatomy education based on radiology, cadavers are actually very important not only for the anatomy department but also for radiology education.
As much as the importance of the cadaver, cadaver embalming solutions are also important today. It has become a very important issue over time. Because as technology progresses, moving beyond the old embalming methods has brought about updates in fixation. Solution selection is no longer based on cadavers used in classical anatomy education.
It has begun to be divided into categories, including surgical training cadavers. The most important factor underlying this is the realization that cadaver education is important in both undergraduate and postgraduate education, and that medical education should not be cadaver-free. is the truth. In addition to the use of cadavers in surgical training, an integrated cadaver radiology training curriculum can be created with the science of anatomy in both undergraduate and postgraduate radiology education.
In this study, the difference between the CT scans of two female cadavers embalmed with Larssen solution and 10% formalin solutions was examined together with the students of the faculty of medicine (Caucasus University Faculty of Medicine) and questions were asked to the students about this training. The questions in the data collection form were prepared as a 5-point Likert test. In line with the answers given, the answers given by male and female students were examined with the chi-square test and statistically p values in each question were revealed.
The fixation quality of the cadaver has become a very important issue in today's education field in terms of manipulations to be made on the cadaver in cadaver education. The second most important criterion after cadaver procurement is the solution with which the cadaver should be embalmed. There are few trial studies on the Larsen cadaver in the literature. Supporting the study data with student opinions is an opportunity to compare the advantages and disadvantages of formalin solution and Larsen solution.

Key words: Cadaver, Embalming, Anatomy Education, Radiology Education

Morphology and morphometric features of navicular bone in the Turkish population

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Aim: Navicular bone is a very important bone for foot movements. Although the risk of osteonecrosis is high in navicular bone fractures, anatomical studies are very rare because fractures are rare. The aim of this study is to describe the morphological and morphometric features of navicular bone reconstruction in the Turkish population.
Methods: 100 (50 right, 50 left) dry os naviculare were measured. The length and width of the bone, groove length of the tibialis posterior tendon, the number of foramen nutricium, and the location of these foramina in palmar, dorsal, medial and lateral areas were measured. Additionally, area measurements of the joint surfaces were also made.
Results: The length and width of the navicular bone were 38.11+/-2.15 mm and 23.15+/-1.75 mm. The length of the groove tibialis posterior tendon was 15.35+/-2.11 mm. A total of 729 nutrient foramina (280 dorsal, 238 plantar, 55 medial, 156 lateral) were measured.
Conclusions: Navicular bone is important for foot movements and its anatomy should be well known in terms of reconstruction. For this reason, morphological and morphometric properties of bone are clinically important. We think that the measurements made together with the joint surface area can be used for reconstruction.

Keywords: navicular bone, reconstruction, morphometry.

A detailed dissection and anatomical study of the hand malformation of a stillborn

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We present a detailed dissection and analysis of the anatomy of a forearm and hand of a stillborn female from 1911 with an Ectrodactyly. This malformation is characterized by the absence of one or more digits. The specimen was 11.5 cm long. It showed a fusion of two fingers on its lateral aspect and two other individual fingers, one on the medial aspect and the other on the middle axis of the specimen. It was labelled “duplication of the thumb with syndactyly of the two thumbs”.
Dissection was performed with microsurgical loupes at 3X to 10X magnification and a surgical microscope at 3X to 30X magnification.
Firstly, the nervous and venous anatomical elements of the subcutaneous tissue were located. Then, the dissection continued with the identification of the muscles, vessels, and nerves in the forearm and hand.
The identification of the extensor pollicis longus, extensor indicis, extensor digiti minimi and flexor pollicis longus muscles, as well as the observation of their distal insertions, allowed us to differentiate each of the fingers in the hand accurately. These findings, and the observation of the neurovascular distribution pattern in the fingers confirmed that the malformation corresponded to a distal fusion of the thumb and index finger and an agenesis of the fourth finger.
The anatomical dissection and a detailed analysis of its findings made it possible to arrive at the correct diagnosis of this hand malformation. These findings provide data on the processes that take place during the embryological development of limbs.

Key words: hand malformation, embryology, locomotor system development

Patella and patellar ligament morphology in comparison with anterior cruciate ligament measurements for bone-patellar tendon-bone grafts during anterior cruciate ligament reconstruction

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Aim: Bone-patellar tendon-bone (BPTB) could be the autograft for anterior cruciate ligament reconstruction (ACLR) in athletes, with excellent long-term results, low recurrence rates. Knowing the average length and width of the patellar tendon will help us identify issues like patella baja or thin patellar ligament preoperatively. The purpose of the present study is to show the measurements of the patella and patellar ligament in comparison with the anterior cruciate ligament (ACL) with the intention of surgical usage and suitability.
Methods:15 %10 formalin fixed cadaveric knee specimens were dissected. The patellar ligament's length, thickness, width (on the proximal-distal end and median part), ACL length, thickness, midpoint width and the patella height and width were measured. Statistical analysis were done by SPSS 27.0 programme.
Results: Patellar ligament length was 55.47 mm, patella height was 52.93mm, patella width was 50.03mm, patellar ligament thickness was 3.44mm, the patellar ligament width was21.93mm, ACL length was 35.60mm, ACL width was 8.56 mm, ACL thickness was 3.05mm on the distal end in mean. There are significant correlations between the patellar ligament width and patellar ligament length ($p=0.013$); between the patella width and patellar ligament width at the distal end ($p= 0.043$); between the ACL length and patellar ligament length($p<0.01$)
Conclusions: The patella and patellar ligament morphology are highly important, especially for specific operations such as bone-tendon-bone grafts and reconstructions of those structures. According to present study, the patellar ligament is a suitable choice for ACL reconstruction and patellar dimensions can be useful for prediction of ligament sizes.

Key words: patella, patellar ligament, anterior cruciate ligament, bone- tendon- bone graft, reconstruction

Comparison of Thickness and Contractile Function of Lateral Abdominal Muscles and Diaphragm in Women with and without Primary Dysmenorrhea

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Objectives: To compare the thickness and contractile function (CF) of the transversus abdominis (TrA) and internal oblique (IO) muscles and diaphragm in women with and without primary dysmenorrhea (PD).
Methods: Women with (PD group, n=30) and without PD (control group n=30) were included in the study. Menstrual pain intensity was evaluated with Visual Analogue Scale. TrA and IO thickness at rest and during abdominal drawing-in maneuver (ADIM) with 11 MHz linear transducer probe, diaphragm thickness at the end of maximum inspiration and expiration with 1-6 MHz convex probe were measured. The percentage of change (PC) in thickness and CF of these muscles was also calculated.
Results: The mean pain intensity of PD group was found as 7.18±1.22cm. There was no difference between groups in terms of thickness of TrA and IO at rest and during ADIM and thickness of diaphragm at the end of maximum inspiration and expiration ($p>0.05$). PC in thickness and CF of TrAright and TrAleft were less in PD group than control group ($p<0.05$). No difference was found between groups in terms of PC in thickness and CF of IOright, IOleft and diaphragm ($p>0.05$).
Conclusion: PC in thickness and CF of TrA muscle were less in women with PD compared to women without PD. There was no difference between groups in terms of thickness and CF of IO and diaphragm muscles. Thus, it may be important to consider the decrease in TrA muscle thickness and CF and to provide exercise training in management of PD.

Key words: Abdominal muscles, Dysmenorrhea, Diaphragm, Women, Ultrasonography

Anatomic feasibility study of soleus nerve transfer to deep peroneal nerve for treatment of foot drop

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Objectives: Deep fibular nerve (DFN) injury is a significant problem resulting in foot drop and affecting the quality of life. Recent studies have shown that nerve transfer to the DFN improves ankle dorsiflexion strength. The aim of this study is to compare the axon number of the DFN, its tibialis anterior branch, and the soleus branch of the tibial nerve for to evaluate their suitability for a possible nerve transfer.
Methods: The length and thickness of the soleus branch, the length and thickness of each main motor branch to tibialis anterior, the thickness of the DFN, and the distance between the branching point of the main branches of the DFN, and the nerve to soleus were evaluated in 15 cadavers. In addition, the DFN and its tibialis anterior branch, and soleus branch of the tibial nerve of 3 cadavers were examined histologically and the number of axons of each nerve was calculated using the Image J program.
Results: The average diameter of the DFN was 1.85 mm. The average diameter of the nerve to the tibialis anterior was 1.44 and to the soleus 1.66 mm. When comparing the total number of axons, the DFN, the soleus nerve, and the main motor branch to tibialis anterior had a mean of 1013, 2123, and 674 axons, respectively.
Conclusion: This study confirmed the anatomical feasibility of transfer of soleus branch of the tibial nerve to DFN or its tibialis anterior branch as an alternative treatment of drop foot.

Key words: foot drop, axon counts, deep fibular nerve, soleus

Morphologic characteristics of Interatrial septum and its clinical relevance

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The development of new trans septal transcatheter interventions for patients with structural heart disease necessitates a precise and comprehensive understanding of anatomy of interatrial septum. The scarce gross anatomical studies have triggered our interest to explore the morphometry and morphology of interatrial septum.
The study was conducted in the Department of Anatomy and Department of Forensic medicine & Toxicology of King George's Medical University, Lucknow, India, on 100 autopsied human hearts, in which we observed the position and shape of fossa ovalis (FO) along with location of prominence of limbus. The diameter of FO and thickness of its floor was measured and redundancy or any variation in interatrial septum was noted. In most of the cases (72.9%) FO was situated towards the inferior vena cava and was oval shaped (69.8%), with mean horizontal and vertical diameter of 17.21±4.11 mm and 12.74±3.78 mm respectively. Limbus was prominent in 72.2% specimens, commonly prominent all around (36.6%) followed by antero-superior (28.2%), antero-inferior (16.9%) and anterior (8.5%) prominence. Mean thickness of floor of FO was 0.71±0.98 mm, showed redundancy in 47% samples. Probe patency was seen only in 10.3% specimens. The right surface of interatrial septum showed more variations (71.1%) as compared to left (44.3%), in form of recess, atrial septal pouch, fibrous strand, retinacular type of fibrous network or combination of more than one type.
Variations in location of FO, prominence of limbus and common occurrence of anatomical variants of interatrial septum mandates the pre-procedural/procedural imaging of the region to reduce the failure rates and complications.

Key words: Fossa ovalis, Limbus, Atrial septal pouch, Probe patency

Evaluation of anatomy comic strips

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Objectives: The author has drawn hundreds of episodes of anatomy comic strips in English for two decades. The comic strips are being serialized in the PLEXUS, IFAA newsletter. It was intended to enable medical students to learn the complexities of anatomy in a straightforward and humorous way.
Methods: 93 Korean medical students, who looked through the comic strips, were surveyed with questionnaire. The anatomy grades were higher in students who read the comic strips than those who did not. The comic strips facilitated memorizing anatomy and assuming attitude toward anatomy. The comic strips also facilitated enjoying with medical persons and non-medical persons.
Results: The students may laugh at the comical situations of comic strips only after acquisition of anatomy knowledge; they then recognize how anatomy enriches them. Nowadays, students are reluctant to specialize in anatomy because of the prejudice that living as anatomists is boring and exhausting; the comic strips could be an innovative tool to demonstrate intriguing and worthwhile activities of anatomists.
Conclusion: Creation and educational use of the benefiting comic strips are ongoing. The author inputted the suitable comic strips to the textbooks such as a neuroanatomy book (Visually Memorable Neuroanatomy for Beginners. Academic Press, 2020).

Key words: Artistic anatomy, Cartoons, Humour, Medical education, Questionnaires

Hofbauer Cells: Placental Macrophages in Health and Disease

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Invited talk

Hofbauer cells have been the subject of intense research in the last decade. They are tissue-resident macrophages found in the chorionic villi of the placenta and they are the only placental immune cells known to be of fetal origin. Although they are considered M2 macrophages, their phenotype is unique. Hofbauer cells are crutial for maintaining a healthy pregnancy. They contribute to immunological tolerance and also play a morphogenetic role, participating in the process of vasculogenesis, angiogenesis and remodelling of the chorionic villi stroma, and more. These elements also play a role in the pathogenesis of pregnancy complications such as type 1 diabetes mellitus, gestational diabetes, preeclampsia, villitis of unknown etiology, chorioamnionitis, transmission of infectious agents, and others. Despite the growing interest, there are generally few studies in the current literature, often performed on small numbers of samples and with controversial conclusions. Our research focuses on their morphology, phenotype and biological behaviour, i.e. cytokine production and its regulation by arachidonic acid metabolites in two common complications of pregnancy, chorioamnionitis and diabetes. We identified CD206 as a reliable marker for their detection, whereas the pan-macrophage marker CD68 is not fully suitable for their detection. Both chorioamnionitis and type 1 diabetes affect the shape of HBCs, with an increase in cells of elongated and irregular shape, and cytokine production changes towards inflammatory activation in these conditions. However, this does not occur in gestational diabetes. We have also shown that cytochrome P450 enzymes, specifically CYP epoxygenases, may play a role in their immunomodulation.

Key words: Hofbauer cells, diabetes mellitus, chorioamnionitis

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Endoscopic anatomy of transmaxillary approach to the orbit

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Aim: Related anatomical structures for sublabial transmaxillary endoscopic access to the orbital region is important for surgical planning and evaluation. Different surgical approaches have been used for removal of lesions within the orbit. The aim of study was to describe and test the anatomic feasibility and to evaluate and describe the anatomy of surgical corridor of endoscopic transmaxillary approach to the orbit.
Methods: Endoscopic sublabial transmaxillary approach to the orbit was performed bilaterally on ten fixed and two fresh-frozen cadaver heads. Step-by- step anatomy of the surgical corridor and related structure were endoscopically identified; anatomical structures were documented and measurements (1-mm scale) including surgical field depths were taken. After comparison with other approaches, important anatomical pitfalls and its advantages were noted.
Results: This approach anatomically has two parts. First part is anterior antrostomy or Caldwell-Luc procedure and second is endoscopic opening the inferior wall of the orbit. Mean width and height of anterior antrostomy was measured as 15.4 mm (9.1-18.7) and 15.1 mm (12.4-19.4). Endoscopic transmaxillary approach allowed multi-angled exposure and handy manoeuvrability around all the inferior intraorbital targets. Means of surgical field depths to the infraorbital nerve, inferior rectus and optic nerve were 28.8 mm (26.4 -30.1), 29.6 mm (27.4-31.6) and 39.8 mm (35.9-46.4).
Conclusions: The endoscopic transmaxillary approach to the orbit is direct and feasible. This approach can be combined with either microsurgical or endoscopic methods. Suitable surgical field depths provide advantages as visualization, manoeuvrability. This approach looks as a worthy alternative to reach directly entire inferior orbit.

Key words: endoscopic anatomy. transmaxillary approach, sublabial approach, orbit

The anatomist´s important role in creating drawings, illustrations or images: the crux of the matter lies in the detail

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Anatomic illustrations and drawings are very important to visualize, explain and show for example complex topographic anatomy. However, a request is the correctness of such a drawing or illustration. Mostly, such images are designed and made my illustrators, who are no anatomists. This might cause troubles in creating correct drawings because the illustrator is lacking the precise, sound, and detailed anatomy knowledge. Consequently, errors in such images might occur, which then can lead to wrong images being printed and published in publications or textbooks. As the anatomist is in the role of the supervisor and reviewer of created images, he or she plays a key role in the final review and acceptance of such images, drawings or illustrations. The process of a drawing for a publication from the first to the final version is presented in addition with some other examples to show the crucial role of a responsible supervising anatomist.

Key words: drawings, errors, development

Teaching and testing anatomy of biomedical engineering students: experiences prior, during and post COVID-pandemic

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Aim: Teaching and testing biomedical engineering students at the Technical University in Anatomy prior, during and post COVID pandemic had to be adapted.
Method: The 30 hours of lecture were performed in the lecture hall live using a blackboard or visualizer for the drawings and no PowerPoints during the lectures prior the pandemic. During pandemic, the lecture was recorded using a visualizer and blackboard for the drawings and writings provided to students on Intranet where they could watch the lecture anytime they liked to. After pandemic, the lecture was performed online using a visualizer. Students had permission to make screenshots of the drawings. All students were examined by oral exam. Prior to pandemic on small casks with anatomical specimens, during and post pandemic, the oral exams were performed online, using anatomical images on 90 PowerPoints slides, which were provided to the students' priority for preparing as well as other supporting PowerPoints (total anatomy; 440 slides). Test results were compared prior, during and post pandemic. Teaching and testing were performed by the same person.
Results: Students grades were clearly best during pandemic, where students could study with the recorded lecture provided. Worst results were observed prior pandemic.
Conclusion: When there is a very strict limit of teaching hours but a large amount of knowledge to be taught, recorded lectures with additional learning documents can lead to satisfying results in oral exams.

Key words: exams, pandemic, lectures,

Morphometric relationship between the transverse and sigmoid sinuses and the occipital belly of occipitofrontalis muscle

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Aim: In intracranial approaches, it is important to understand the relationship between extra and intracranial structures for meticulous planning. To evaluate the locations of intracranial structures such as transverse and sigmoid sinuses, many external anatomical points have been used. In this study, we examined the relationship between the insertion of the occipital belly of occipitofrontalis muscle (OFM) to the superior nuchal line (SNL) and these sinuses.
Methods: 5 cadavers whose calvaria were already exposed, were dissected. After the muscle insertion was observed, thin holes were drilled in the grooves of the sinuses to check where the muscle insertion line was located. Measurements were made with a digital calliper.
Results: The insertion of the occipital belly of OFM was measured. The percentage of the SNL covered by OFM was calculated. A parallel line was drawn from the lowest point of the mastoid process to the insertion of the occipital belly. The section below this line was divided into 4 imaginary regions as 2x2. It was noted in which region the projections of the grooves of the sinuses were located. The medial half of the muscle was on average 10.76±2.88 millimetres above the groove for the sigmoid sinus, and the lateral half coincided with the sinus. The statistics of the measurements and their correlation with biparietal diameter were determined.
Conclusions: The occipital belly of OFM being a prominent muscle makes it a good sign for surgeries. Demonstrating the relationship between the muscle and the dural sinuses may guide surgeons in intraoperative planning.

Keywords: transverse sinus, sigmoid sinus, occipital belly of occipitofrontalis muscle, superior nuchal line, skull base

Bridging theory and practice: key benefits of using 3D anatomical atlases alongside dissection

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Aim: Integrating digital tools into traditional anatomical education can significantly enhance the learning experience. This study evaluates the benefits of using a 3D anatomical atlas alongside dissection, focusing on specific functionalities that have helped students the most.
Methods: Over a four-year period, more than 600 medical and physiotherapy students utilized both traditional dissection and a 3D anatomical atlas in our department. The atlas featured detailed hierarchies of organs, interactive layered systems, visualization of related organs, and comprehensive muscle origin and insertion points. Student performance was assessed through practical exams and surveys.
Results: The integration of the 3D anatomical atlas demonstrated substantial improvements in students' understanding and retention of anatomical structures. The hierarchical organization of organs helped students grasp the complex relationships within and between systems, enhancing their theoretical knowledge. The layer-by-layer feature allowed for in-depth exploration of each system, fostering a more comprehensive understanding of anatomy from the innermost to the outermost layers. Additionally, the ability to visualize related organs, such as blood supply and innervation, provided a deeper context for clinical correlations. The detailed depiction of muscle origins and insertions facilitated a better grasp of musculoskeletal anatomy, improving practical skills in identifying and understanding muscle functions.
Conclusion: The use of a 3D anatomical atlas alongside traditional dissection significantly bridges the gap between theoretical knowledge and practical application. This hybrid approach not only enriches the educational experience but also better prepares students for clinical practice.

Key words: 3D Anatomical Atlas, Anatomy Education, Hierarchy of Organs, Layer-by-layer Systems, Related Organs

Surface and palpation anatomy: a decade of experience in enhancing anatomy education

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Aim: Surface and palpation anatomy, integral components of anatomical education, have gained popularity due to their practical relevance in clinical practice. Over the past decade, I and my team of lecturers has integrated these methods into the anatomy curriculum, providing physiotherapy students with hands-on experience to enhance their understanding of anatomical structures.
Methods: We conducted a retrospective analysis of our anatomy teaching methods over the past ten years. The curriculum incorporated surface and palpation anatomy sessions, utilizing live models and cadaveric specimens with more than 200 palpating structures. Student feedback was collected through surveys and assessments to evaluate the effectiveness of these methods in improving anatomical knowledge and clinical skills.
Results: Data from over 100 students indicated a significant improvement in anatomical understanding and clinical palpation skills. Students reported increased confidence in identifying anatomical landmarks and understanding their relevance in clinical scenarios.
Conclusion: Our ten-year experience demonstrates that integrating surface and palpation anatomy into the medical curriculum significantly enhances students' anatomical knowledge and clinical skills. These methods provide a practical, hands-on approach that bridges the gap between theoretical knowledge and clinical practice. Continued emphasis on surface and palpation anatomy is recommended to further improve medical education and patient care outcomes.

Key words: Surface Anatomy, Palpation Anatomy, Medical Education, Clinical Skills, Anatomical Teaching

Student Opinions on the Use of the 3D Imaging Method in Anatomy Education

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Aim: The mental visualization of the shape and organization of different anatomical structures has a very important place in the learning process. This study aimed to evaluate the effectiveness of the spatial relationships between the cross sections of 3D anatomical images in the coronal, sagittal and horizontal planes in the learning process of students. These new educational materials in the digital age can help to better understand the localization of anatomical structures and to encourage students to use their time more effectively according to their learning speed and ability.
Methods: Our study was conducted on second-year students (n=114) studying at Başkent University Faculty of Dentistry in the spring semester of the 2023 2024 academic year. Firstly, a preliminary questionnaire was administered to the students inquiring about the anatomical structures they had difficulty in understanding during the neuroanatomy course. These structures were then demonstrated to the students during the practical lesson using the 3D imaging method. After the training, students' opinions were evaluated using a questionnaire.
Results: More than 50% of the students stated that the anatomy education given using the 3D imaging method at the end of the practical training facilitated the comprehension of the anatomical structures, and that it would be useful to include the method in the anatomy education process.
Conclusions: According to the results of our study, we think that the 3D imaging technique has positive effects on the understanding of complex anatomical structures within the scope of anatomy education, and that it will support classical teaching methods.

Key words: anatomy education, 3D imaging, students

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Relationship of branches of the sural nerve and the small saphenous vein

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Aim: The small saphenous vein and the sural nerve form a superficial neurovascular bundle on the posterior aspect of the leg. The sural nerve harvest can be complicated by the presence of side branches. The aim of our study was to reveal the mutual relationship the sural nerve and the small saphenous vein and to map their side branches.
Methods: Fifty adult cadaveric legs (25 left and 25 right) obtained from 27 Central European cadavers were meticulously dissected.
Results: We observed 15 cases where the sural nerve was medial and 35 cases where it was lateral to the small saphenous vein proximally but later crossed or overlapped it. The average number of sural nerve side branches in a single leg was 4.2±1.9. These side branches were categorized into six groups based on their location and course. The highest density of sural nerve side branches was found 2.1-6.0 cm above the lateral malleolus.
The small saphenous vein received an average of 4.9±2.1 (3–9) tributaries. The most proximal tributary was 1.9±0.6 mm (0.7–2.8 m thick and was located 9.6±2.6 cm above the apex of the lateral malleolus, while the most proximal perimalleolar tributary was 1.7±0.5 mm thick and was situated 4.6±0.9 cm above the apex of the lateral malleolus
Conclusion: Our results can be used to predict the localization of separate incisions during the stair-step incisions technique for nerve harvest, and also for the small saphenous vein surgery, thereby reducing the risk of complications.

Key words: sural nerve; small saphenous vein; nerve harvest

The branching pattern of the upper and lower subscapular nerves: an anatomical and cadaveric study

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Objectives: The course of the upper and lower subscapular nerves and their distance from certain landmarks to the shoulder girdle are important in shoulder surgery and nerve transplantation. This study aims to determine the surgical anatomy and innervation pattern of the upper and lower subscapular nerves and to discuss the clinical importance of the presented findings.
Methods: We dissected 8 upper extremities of 4 formalin-fixed cadavers were dissected through a deltopectoral approach. The number and length of the upper and lower subscapular nerves and their corresponding distances to the coracoid process were measured
Results: The mean number of upper and lower subscapular nerves were 1 (min:1, max:2) and 3 (min:2, max:4), respectively. The mean distance from coracoid process to upper subscapular nerve origin was 31.57±6.68 and to lower subscapular nerve origin was 44.14±9.25 mm. Upper and lower subscapular nerves entered the muscles with a mean of 32.27±8.93 and 67.75±9.93 mm away from the coracoid process, respectively. The mean length of the upper and lower subscapular nerves was 25.88±13.07 mm and 37.91±11.85, respectively.
Conclusions: Defining the position of subscapular nerves relative to the coracoid process it is possible to identify a safe zone for surgical procedures by evaluating and these preliminary data may assist in reduce complications during surgery. Determining the length of subscapular nerves and their branching patterns is of paramount importance for nerve transfer surgeries where upper or lower subscapular nerve is used as a donor.

Key words: lower subscapular nerve; nerve transfer; upper subscapular nerve

CANDID (Collaborative Anatomy Near-peer Demonstrator-led Inter-Disciplinary Education Trial) - The impact of previous anatomy teaching on performance in anatomy spotters

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Aim: To identify whether anatomy background from a previous degree or teaching anatomy to peers in medical school has a greater impact on performance in anatomy as a medical school subject.
Methods: This controlled trial registered 156 first and second-year Swansea graduate-entry medical (GEM) students into four cohorts: first-year students with and without prior anatomy teaching and second-year students with and without prior anatomy teaching. Among these, some first (n=15) and second year (n=11) students were anatomy demonstrators for undergraduate modules. Those who were first-year near-peer teachers started teaching after the first spotter. Everyone was tasked with taking three timed synchronous virtual "spotter"-type examinations over the duration of 15 weeks. The exams were constructed to reflect the anatomy learning outcomes of the GEM degree.
Results: Those who were currently near-peer demonstrators outperformed their peers, with data processed using Excel and analysed using SPSS. There was a significant difference between first and second-year students' scores globally ($p<0.001$, unpaired T-test) although there was no significant difference in scores obtained between those with prior anatomy background and those without ($p>0.05$, unpaired T-test).
Conclusion: Medical students involved in the interdisciplinary near-peer anatomy teaching programme achieve significantly higher marks in anatomy short-answer spotter-type examinations. The student's academic background has no significant benefit to their score. The authors infer that it is the ability to teach anatomy material to peers, rather than a pre-medicine anatomy background that enhances students' performance in the anatomy module of the medical school curriculum.

Key words: anatomy, education, graduate entry medicine

Branches Innervating Gastrocnemius and Soleus Muscles and Their Ratio to Leg Length: A Cadaver Study

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Aim: It is important to know the length of the motor branches that provide innervation to the muscles for functional muscle transfers. In our study we aimed to measure the course of the tibial nerve and the lengths of the motor branches it gives, between the area where it leaves the nerve and the place where it enters the muscle for innervation, and by proportioning these lengths to the leg.
Methods: 20 leg dissections fixed with 10% formaldehyde were performed. The lengths of the motor branches given by the tibial nerve to the gastrocnemius and soleus were measured and proportioned to the leg length. The distances of the points where the motor branches of these muscles leave the tibial nerve and enter the muscle to the tendinous arch of the soleus and the point where the line passing through the femoral condyles intersects with the tibial nerve were measured.
Results: Average leg length is 397.88 mm. The lengths of the motor branches are as follows; It is 43.77 mm for the lateral head of gastrocnemius, 51.74 mm for medial head, and 46 mm for soleus. The ratios of the branches to the leg length are 0.11 for the lateral head of gastrocnemius, 0.13 for medial head and 0.12 for soleus, respectively.
Conclusions: This study by determining the ratio of the nerves innervating the gastrocnemius and soleus muscles to the leg lengths, obtain information about the lengths of the branches before surgery for functional muscle transfers.

Key words: cadaver study, dissection, tibial nerve, motor branches, functional muscle transfers

Optimized in vivo model for long-term visualization of glioblastoma growth using deep two-photon microscopy with single-cell resolution

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Glioblastoma multiforme (GBM) is a lethal primary tumour of the central nervous system marked by significant treatment resistance. Currently available in vivo models can be divided into several groups: implantation of syngeneic primary tumour cells or cell lines into immunocompetent animals, implantation of human glioma cell lines or patient-derived glioblastoma into immunocompromised animals, implantation of cells with genetically modified oncogenes and tumour suppressor genes, and genetically engineered models. One major advantage of syngeneic immunocompetent models is the possibility to study the role of resident immune players in tumour progression, which is crucial for evaluating new therapeutical strategies. The GL261 cell line is the gold standard in murine models of glioblastoma due to its fast in vitro growth, high transduction efficiency, and moderate immunogenicity. A second aspect, which is often considered in syngeneic mouse glioblastoma models, is a form of engrafted mass plays a role, adherent (suspension), or non-adherent cells (tumorpshere). It has been demonstrated that glioblastoma stem cells lack cellular heterogeneity and the 3D spatial configuration necessary for the interaction with the tumour microenvironment. In this study, we report testing of several possible closures of the implantation capillary scar to prevent the epidural migration of the tumour cells. We further characterize the model including the respective scar closure options in terms migratory activity of the cells, possible induction of sterile inflammation and the depth penetration of two-photon microscopy imaging keeping the cell resolution. We further used our model to characterize neovascularization in growing tumour with high spatial resolution.

Key words: Glioblastoma multiforme; two-photon microscopy; in vivo model; oncology; tumorsphere

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Analysis of the clinical relevance of abductor pollicis longus tendon morphological variability through an anatomical lens.

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Aim: Classical anatomy literature describes abductor pollicis longus (APL) as a single tendon muscle inserting on the base of the first metacarpal bone (1ºM) although recent investigations have shown this description to be inaccurate. Nevertheless, methodologies used did not take into account the clinical impact of these variations, therefore, the purpose of this research is to offer clinicians a description of APL's morphological variability applicable to their fields.
Methods: 54 upper limbs from the body donation program were dissected using standard procedures to determine the number of APL tendons, their position and site of insertion. The presence or absence of the extensor pollicis brevis (EPB) muscle was also recorded.
Results: A total of 129 APL tendons were found on the 54 upper limbs dissected. The most constant number of APL tendons was 2, ranging from 1-5. Main APL tendons were considered as those inserting on the base of the 1ºM and could be single, double or triple. Accessory tendons were located on a more medial-palmar position ($p<0,001$; Cramer's $V=0,6$) and were most commonly inserted on the abductor pollicis brevis (APB). However, both tendon typologies had divisions on their terminal insertion, spreading to other anchorage spots. EPB absence was not related to numerical or morphological variations of APL tendons.
Conclusions: Anatomical variation of the APL tendon could be classified according to distribution of main and accessory tendons. These findings would therefore have an impact on the pathophysiology, radiological and surgical approach to wrist traumatological and orthopaedic pathology.

Key words: abductor pollicis longus, clinical anatomy, anatomical variations

Anatomical landmark for preservation of recurrent laryngeal nerve in thyroid surgery

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In thyroid surgery, injuries to the recurrent laryngeal (RLN) nerve can be a serious complication, affecting patient's quality of life.
During dissection of cadaver parts, it was studied the RLN tract and its relation to fascia pretrachealis, and thus determine its value as an anatomical landmark for preservation of RLN in thyroid surgery.
There were used 21 cadaver parts (anterior cervical organs) obtained from autopsies and cryopreserved. The RLN was identified bilaterally and its relation to fascia pretrachealis, inferior thyroid artery, superior parathyroid glands, and posterior aspect of the thyroid lobe was documented.
The fascia pretrachealis inserts laterally in the edge of the cartilaginous rings of the trachea (bilaterally).
The RLN was located laterally to the fascia's insertion in both sides of the trachea in all the 21 cases studied. By identification of this structure, it is easier to delineate a dissection plane in order to preserve the recurrent laryngeal nerve in its location until it enters the larynx.
The relation of the RLN to the inferior thyroid artery, superior parathyroid glands, and posterior aspect of the thyroid lobe is more variable, due to the anatomical variations of this structures.
When compared to the other structures, fascia pretachealis is the most reliable landmark to identify and preserve the nerve during thyroid dissection.
During thyroid surgery, dissection of the inferior border, should start by identification of the insertion of pretrachealis fascia and proceed medially to it, in order to minimize the chances of injuries to the RLN.

Key words: Recurrent laryngeal nerve, thyroid surgery, anatomical landmark, post-operative complications

Vascularization of parathyroid glands: cadaver study and surgical implications

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In thyroid surgery, the vascularization of parathyroid glands must be preserved to reduce post-operative hypocalcemia.
Objective: study in cadaver parts, the vascularization of parathyroid glands and identify anatomical landmarks that help its preservation.
There were used 21 cadaver parts (anterior cervical organs) obtained from autopsies. The superior and inferior thyroid arteries were dissected and injected with an isoprene polymer (liquid latex). Anatomical dissection was performed to identify the branches of thyroid arteries and parathyroid glands. In total, 80 parathyroid glands were identified. The vascular pedicle of the parathyroid gland was: 1 artery in 64 cases, 2 arteries in 12 cases and 3 arteries in 4 cases. The hilum was located on the postero-lateral surface of the glands.
The length of the parathyroid vessels was on average 8mm (min. 2mm; max. 12mm), and in 6 cases the artery passed through thyroid parenchyma.
The origin of parathyroid arteries was: in all inferior parathyroid glands, the anterior branch of inferior thyroid artery; in 2 superior parathyroid glands, the superior parathyroid artery, and in the rest of superior parathyroid glands, the posterior branch of inferior thyroid artery. The parathyroid arteries are terminal branches and are located anterior and medial to the recurrent laryngeal nerve and laterally to the insertion of the pre-tracheal fascia.
Parathyroid arteries are terminal branches of the inferior thyroid artery. They are located in the area between the insertion of the pre-tracheal fascia and recurrent laryngeal nerve, and so the dissection in this area should be avoided during surgery.

Key words: Parathyroid, thyroid surgery, arteries, cadaver study.

On the terminology of the VIII cranial nerve – historical perspective

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The first mention of the cranial nerves can be found in ancient anatomical pieces by Galen of Pergamum. The aim of this contribution is to give an overview of the historical development of the term describing the vestibulo-cochlear nerve. Furthermore, the number of pairs of cranial nerves described is traced, including tracing the order of the vestibulo-cochlear nerve among the cranial nerves, from Galen to the present. Finally, the development of a vernacular term in some other languages is supplied.

Key words: VIII cranial nerve; vestibulo-cochlear nerve; terminology, history

The impact of pelvic floor awareness on post-partum women

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The pelvic floor (PF) consists of muscles which support the abdominopelvic organs, controls urinary and faecal continence, resists pressure in the abdominal and pelvic cavity, and aids in sexual function. Often, post-partum women suffer from PF dysfunction, which commonly presents as urinary incontinence or pelvic organ prolapse. Pelvic floor dysfunction and its related symptoms can have a large negative impact on women's physical and mental health.
Recently there has been an acknowledgement of issues faced in the field of Women's Health, with financial investments, and new policies created in England and Wales; with aims of raising awareness and prioritising prevention of PF related issues.
The aim of this study was to investigate the impact that PF knowledge and awareness had on post-partum women in the UK.
A total of 115 women who had given birth in the UK within a 10-year window completed the online survey. Only 12% of respondents felt that they were informed or had received education on the PF. On the contrary, 88% of women felt they would have benefitted from better education. Both physical and emotional symptoms were worse in the group of women who felt that they were not well informed. 53% of women with little education/awareness of the PF answered 'Not at all' when asked how well informed they felt about potential damage to the PF following childbirth, compared to 7% of women in the 'informed' group.
Better education and increasing awareness of the pelvic floor and the impact of childbirth is still needed.

Key words: Pelvic floor, education, women

The fine anatomy of suboccipital fasciae and their clinical applications

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Occipital neuralgia has an incidence of 3/100000 people. It can be caused either by the compression of the greater occipital nerve (GON), the third occipital nerve (TON) or the lesser occipital nerve (LON). However, most cases are idiopathic. The GON block is one of the most widely used techniques for occipital neuralgia treatment, but it fails in 40% of patients.
Aim: To describe the detailed anatomy of the connective tissue around the trajectory of the TON and GON in the suboccipital area.
Methods: The deep nape region was studied in 6 fresh-frozen adult cadaveric specimens. Five of them were studied by means of macro and microdissection. One of these subjects had been previously injected with methylene blue solution around the GON block. After dissection, one of these specimens was processed for conventional histology. The sixth specimen was processed to obtain serial semithin Biodur® P40 transversal slices.
Results: The sub-semispinalis capitis connective tissue showed a well-defined structural organization between the C1 and C3 spinous processes. We observed the presence of myofascial connective septa forming anatomical tunnels around the nerve trajectories in the suboccipital area.
Conclusions: This distinctive arrangement of the sub-semispinalis capitis fascia may affect the normal diffusion of drugs injected for C2 and C3 nerve blockade. Consequently, the obliquus capitis inferior muscle injection shows significant inefficacy in treating occipital neuralgia.

Key words: suboccipital fascia, occipital neuralgia, greater occipital nerve

Experimental and bioinformatic analysis of miRNA disparities in the bicuspid aortic valve aortopathy population: knowledge base and experimental protocol

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Aims: The bicuspid aortic valve (BAV) phenotype occurs in 1% of the population. Critical dilatation of the ascending aorta occurs in 20% of BAV, often resulting in aneurysm and/or dissection (BAV-A). Surgical repair may be prophylactic, elective or emergency according to the stage of aortopathy. A unique blood molecular profile of the BAV-A population would allow prediction of aortopathy in BAV patients before disease onset. Previous phases of this research theme have identified five micro-ribonucleic acids (miRNA) disparities in biopsied aortic tissue.
We aim to quantify these miRNA disparities in corresponding blood samples to identify blood-based disparities.
Methods: Our null hypothesis is that miRNA concentrations do not differ between BAV-A vs. control patients. Aortic surgery patients were recruited between 2021-2022. The ongoing OMACS biobank provided control samples. Circulatory samples were blinded and underwent RNA isolation followed by reverse transcriptive quantitative polymerase chain reaction (RT-qPCR) to compare miRNA concentrations. Further bioinformatic analysis allows the role of miRNA in BAV-A pathophysiology to be identified.
Results: miR-21-3p, miR-199b-5p, miR-128-3p, miR-150-5p and miR-210-3p were previously validated in tissue via next-generation sequencing. Our population (n= 45, nBAV-A= 30, nOMACS= 15; median 58, IQR 56-67, 67% male). Pathophysiology favoured anterior right AAo dilatation (80%), with moderate-to-severe regurgitant (47%) and/or moderate-to-severe stenotic (73%) disease within the BAV sub-population.
Conclusions: A robust protocol in RNA isolation and quantification will determine whether validated tissue miRNA disparities are replicable in blood and whether this may allow earlier, minimally invasive, radiation-free prediction of the onset of aortopathy in the BAV population.

Key terms: Congenital Heart Disease, Molecular Pathology, Cardiothoracic Surgery

Comparison between qualitative and quantitative sex estimation based on pelvic anatomy

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Sex estimation is an essential step in understanding past populations and social agency in bioarchaeology, as well as integral to assisting in the identification of human remains in forensic cases. Among other skeletal elements, the pelvic anatomy has been proven to be a good biological sex marker due to its direct connection to parturition. As such, this has led to the creation of visual and/or metric based methodologies. A sample of 114 individuals from the Legal Medicine Institute of the University Complutense of Madrid documented skeletal collection, was analysed to compare the intra-observer reliability, the applicability, the results' concordance, and the accuracy outcomes of two different sex estimation methodologies: DSP2 (quantitative) and Bruzek's (qualitative). Intra-rater reliability regarding sex outcomes reached almost perfect agreement in both methods ($K>0.9$; $p<0.001$), while good to excellent agreement values were achieved in most of the cases when individual variables were considered. Applicability percentages were high, with 96.5% and 99.1% values for DSP2 and Bruzek's respectively. Regarding individual variables within both methodologies, the majority achieved applicability percentages higher than 80%. In addition, agreement values between both methodologies were almost perfect ($K =0.801$; $p<0.001$) and accuracy outcomes were considered high: i.e., DSP2 achieved a rating of 92.71% correct sex estimations ($K=0.860$; $p<0.001$), while Bruzek's achieved a rating of 91.84% ($K=0.846$; $p<0.001$). In conclusion, despite the corresponding advantages and drawbacks of morphognostic (Bruzek) and morphometric (DSP2) evaluated methods, they seem to have similar reliability, applicability, and accuracy outcomes when applied to a documented and well-preserved Spanish skeletal sample.

Key words: Human identification, forensic anatomy, anthropology

Anatomical bases of the deep gluteal syndrome

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Deep gluteal syndrome (DGS) describes the pain in the buttock region once the lumbar pathology is discarded and leads us to focus on the region of the subgluteal space (SS). The DGS is a condition that includes several etiological bases which lie in the macroscopic entrapment of the sciatic nerve (SN). Recent hypotheses for DGS suggest that the microanatomical relationships between the SN and the vascular and musculoaponeurotic perisciatic tissue could take part in the pathogenesis of this condition.
Aim: To describe the detailed anatomy of the perisciatic connective tissue and its role in the fixation and biomechanics of the SN in the SS.
Methods: 20 human subgluteal regions were studied. 15 hemipelves were analysed by macro and microdissection; semi-thin serial sections were obtained from 4 ultrafrozen pelves and Biodur® P40 plastination technique was applied. A basic histological study was done in the last hemipelvis.
Results: Morphological variations of the SN in relation with piriformis muscle and the presence of neurovascular bands were observed. The perisciatic connective tissue showed a particular disposition, with minimal thickness on its anterior side. We also defined anchor points of this tissue to neighbouring structures, being the lateral anchors more continuous and stronger than the medial ones.
Conclusions: The anterior eccentricity of the SN within the SS and its proximity to deep muscular structures could facilitate the stimulus of the SN by irritating substances subsequent to anoxia in cases of muscular distress. Thus, we could be dealing with a new non-compressive etiology of DGS.

Key words: deep gluteal syndrome, sciatic nerve, subgluteal space

Nanoscale Remodeling Effects of Pirfenidone on Cardiac T-Tubules and Ryanodine Receptors in Heart Failure

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Aim: This study investigated whether the antifibrotic drug pirfenidone (PFD) can mitigate the nanoscale remodelling of the transverse (t)-tubules in a myocardial infarction (MI) model of heart failure (HF).
Methods: Three groups of Wistar rats were used: SHAM, MI, and MI treated with PFD (MI+PFD). After MI induction, the MI+PFD animals received 300mg/kg/day of PFD. Cardiac function was assessed using echocardiography at ~8 weeks. Immunohistochemistry of the left ventricle border zone examined fibrosis (COL VI), t-tubules (Caveolin-3), and ryanodine receptors (RyR). Super-resolution imaging modalities (Airyscan, STED, and DNA-PAINT) were used to acquire images, which were quantified for parameters like area, length, width, periodicity, and angular changes.
Results: Both MI groups showed a significant decline in cardiac function, despite a pronounced downregulation of COL VI with PFD in the extracellular matrix. Cav-3 relocation from the sarcolemma to the t-tubules in the MI group was reversed with PFD. Visual inspection revealed amelioration of structural remodelling for t-tubules and RyR2 in MI models with PFD, but quantitative analysis could not discern these visual changes.
Conclusions: This study provides promising results, suggesting that PFD can prevent structural nanoscale remodelling and rectify changes displayed in disease, despite the inability to quantify visual changes due to limitations in the analysis methods employed.

Key words: Heart failure, nanoscale changes, Super-resolution

Problematic Modifiers in the TA

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We all teach Latin, not Anatomy. In two talks (one presented at ISCAA in Faro) I (Stiles) introduced what I have seen during my 40 years of teaching Medical Terminology as a "looseness" of usage of modifiers in the TA and its associated Latin corpora.
Those papers concentrated on the sometimes laughably misleading use of genitive nouns as modifiers (the so-called "non-concordant attributes"), and cited an excellent example: rami nasi arteriae, meant to name "nasal branches of an artery," but translatable only by the astonishing English phrase, "branches of the nose of an artery."
In this paper we move on, suggesting how explicit distinctions made by Latin grammar (between genitive nouns used attributively, and adjectivalized versions of those same nouns) compel us to insist upon a "tighter," more specific interpretation of each type of modifier. Thus, while arteria pulmonalis and arteria pulmonis both name the pulmonary artery, one Latin phrase specifies "function" (the artery "serves" the lung), the other "location" (the artery "belongs to" the lung).
We also show how Latin adjectives have extremely specific referents, so that arteriae pulmonales dextrae [TA2 4077] cannot mean "the arteries serving the right lung" (= arteriae dextropulmonales). Similarly, we show that adjectives are "terminal," in that their noun-roots cannot serve as new head nouns; thus, arteria lobaris…pulmonis… [4078] must name "an artery, serving a lobe, and belonging to a lung" and not "an artery, serving a lobe of a lung" (= arteria pulmonolobaris).

Key words: terminology, Latin, adjectives, precision

Spatial relationship between the retroperitoneal fasciae on the dorsal side of the pancreas and the nerves

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The fascia on the dorsal surface of the pancreatic head is referred to as the fascia of Treitz, whereas the one on the body and tail is termed the fascia of Toldt. These fasciae seem to influence the course of the nerves originating from the celiac plexus and distributed to the pancreas. Therefore, this study aimed to clarify the spatial relationship between the fasciae and nerves.
Eight cadavers (age at death: 88.8 years) were used for this study. Five were macroscopically examined, and three were sectioned serially into 8-μm thick slices at 0.25-mm intervals. Two of the three were 3D reconstructed using TRI/3D-SRF Ⅱ.
The nerves from the celiac plexus did not penetrate the fasciae of Treitz and Toldt. They converged and passed through the gap between the fasciae around the celiac trunk (CeT) and superior mesenteric artery (SMA) roots towards the pancreas. This gap between the fasciae gradually narrower caudally to the SMA root and closed between the SMA and inferior mesenteric artery (IMA) roots. In other words, the fasciae of Treitz and Toldt got closer, and the boundary between them disappeared inferior to the SMA root. Then, the overlapped part of these fasciae covered the aorta's anterior surface between the SMA and IMA roots.
Our findings suggest that the nervous pathway connecting the retroperitoneal region and peritoneal organs is not just the area between the fasciae of Treitz and Toldt but the very narrow and confined gap created by these fasciae primarily centred around the CeT and SMA roots.

Key words: retropancreatic fascia of Treitz; retropancreatic fascia of Toldt; celiac plexus; pancreatic head plexus; pancreas

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Should we reconsider the coracobrachialis muscle's typical anatomy? Intercomparison between human fetuses and adult cadavers

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Aim: The purpose of the current study was to investigate the coracobrachialis muscle (CB) anatomy along with the musculocutaneous nerve (MCN) course, and to identify possible differences after the comparison of adult and foetal cadavers.
Methods: One hundred and sixty (from 100 human foetuses and 60 adults cadaveric) upper limbs (83 left-sided and 77 right-sided) were dissected and investigated for CB morphology, MCN course, and possible coexisted variants. Results: The commonest CB type was the two-headed muscle (having one superficial and deep head), with the MCN passing between two heads, in 93 upper limbs (56 in foetuses and 37 in adults, 58.1%). The second most common type was the single-headed muscle, with the MCN coursing medially to the CB, in 30 upper limbs (18 in foetuses and 12 in adults, 18.8%). Other rarer types, such as the three-headed CB (two superficial, and one deep) with the MCN between the heads in 19 arms (12 in foetuses and 7 in adults, 11.9%), and a four-headed CB (two superficial, two deep heads) in 17 upper limbs (13 in foetuses and 4 in adults, 10.6%) were observed. The most common coexisted variants were the biceps brachii third head, the median nerve (MN) absence, and MCN-MN interconnections.
Conclusions: CB's typical anatomy is the two-headed muscle, with one head superficial and the other deep to the MCN. In the current study, there was no difference between foetal and adult cadavers for the CB different morphological types. Adequate knowledge of CB typical and variant anatomy is of paramount importance for orthopaedic surgeons to avoid pitfalls and iatrogenic lesions.

Key words: coracobrachialis muscle, musculocutaneous nerve, variation, dissection, foetuses

Poster Presentations

P1

Revision of human anatomy teaching methods in the training of medical students

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Anatomical dissection and master classes are regarded as the gold-standards in anatomy learning, yet innovative methodologies such as 3D applications or PBL have been demonstrated as equally effective.
Aim: Our main goal was to assess the medical students' preferences and the relevance they give to anatomical knowledge in their training.
Methods: 196 students (152 ♀; 44 ♂) answered a survey with the aim to analyze the value of PBL, lectures, apps, books or drawings to better comprehend 3D anatomy, as well as the impact of traditional methodologies such as cadaver dissections. Furthermore, the relevance anatomical knowledge bears in their future career was also evaluated.
Results: Acquired anatomical knowledge was found to be sufficient by 60,7% of the students. Alternatively, the feeling of lack of enough anatomical competence was substantially increased in the fourth-year students, possibly related to the learning boundaries set during COVID-19 pandemic. Despite this, 59.2% of students found their anatomical knowledge crucial for the completion of clinical courses. Moreover, all methodologies were found to be very or quite useful with higher preference for practical workshops. In addition, the use of cadavers was the most beneficial for anatomy learning and anatomical illustrations and 3D apps were also found to be fruitful for the understanding of anatomical structures, chiefly in students without any background in anatomy ($p<0.05$).
Conclusions: Altogether, students assured that anatomical knowledge is imperative in the study of medicine and in medical care, and rising 3D technology is becoming a crucial tool for anatomy learning, especially for starters.

Key words: anatomy teaching, anatomical competence, teaching methods

P2

Anatomy of the Vertebral Artery in the cervical spine and potential for injury during Anterior Cervical Surgery

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Anterior cervical surgery is a well-established surgery performed in the management of cervical spinal pathologies. Although this surgery is considered to be safe, it could lead to serious complications such as incisional haematoma, oesophageal perforation, recurrent laryngeal nerve injury and vertebral artery injury. Therefore, it is important for clinicians to have a sound anatomical knowledge of the anterior cervical spine and employ preventative measures to avoid damage to the adjacent structures. This project aims to review the anatomy of the vertebral artery and its anatomical variations and analyse current literature to understand the mechanism of intraoperative injury and discuss management strategies.
A supervised full body dissection on the anterior cervical spine was performed to review the anatomy of the artery. Currently employed operative techniques were evaluated, accounting for common anatomical variations that may alter the standard surgical approach.
It was found that injury predominantly occurs during excessive lateral drilling of the disc, followed by instrumentation, and soft tissue removal. Anatomical variations of the artery increase the risk of injury and disregard the usefulness of surgical landmarks. There is no consensus on the surgical management of vertebral artery injury. Current literature recommends haemostatic packing as primary management, followed by direct surgical repair, or endovascular coiling and stenting. Further systematic reviews and meta-analyses of large volume randomised controlled trials are needed in the future to define its true incidence and standardise management strategies. Categorising the injury complications according to immediate or delayed onset is important for establishing effective monitoring protocols.

Key words: Vertebral artery injury, Anterior cervical discectomy and fusion, Anterior cervical corpectomy and fusion

P3

Analysis of olfactory fossa asymmetry using coronal computed tomography

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Aim: The olfactory fossa (OF) is a depression located at the top of the os ethmoidale bounded inferiorly by lamina cribrosa, laterally by thin lamina lateralis, and medially by crista galli. The Keros classification is used to classify the depth of the OF (Type I - 1-3mm; Type II - 4-7mm; Type III - 8-16mm). During endoscopic nasal surgery, the risk of injury exists due to the delicate nature of the lamina lateralis. The aim of this study was to evaluate the depth and incidence of Keros types of the OF in Croatian population.
Methods: The measurements were conducted on CT scan's coronal images on 39 subjects (20 women and 19 men). The parameters were compared regarding the gender and the side of the body.
Results: The total incidence of Keros type II (66,91%) was significantly higher than type I (8,82%) and type III (24,28%). In addition, the incidence of risky Keros type III was in comparison to other populations higher, with higher appearance in females (27,5%) than males (21,06%) being deeper and more prevalent on the right side.
Conclusion: There are differences in the depth and prevalence of risky Keros type III of the OF regarding gender and side of the body as well as among populations. In our studied population the prevalence of Keros type III was noticeably higher than in other studies so before endoscopic nasal procedures, it is necessary to assess and classify the degree of depth of the OF to avoid complications on time.

Key words: Computed tomography, Keros classification, Olfactory fossa

P4

The Impact of 3D-printed Models for Graduate Entry Medical Students Learning Skull Anatomy

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First and second year Swansea University graduate entry medical students were recruited and randomly allocated to intervention and control groups. Intervention group students received 3D printed skull models (70% of size) to aid their anatomy study over forthcoming weeks. All participants had access to an accompanying skull anatomy website for the duration of the study and completed anatomy spotter tests to assess anatomical knowledge. Intervention students demonstrated greater improvement in anatomy test scores compared to control group participants, and this was particularly noticeable among Year 1 students. Intervention participants report significantly greater improvement in confidence in skull anatomy than the control group. Survey results showed that 93.3% of the intervention group reported improved motivation for study, outperforming control group motivation. Positive attributes reported for the models included being able to visual structures in 3D and portability of resources. There was substantial desire to use more 3D printed anatomical models in the future study practices. These findings commend 3D printed model libraries in graduate entry medical anatomy education

Key words: 3D-Printing, Pedagogy, Graduate Entry Medicine

P5

Osteogenic and inflammatory response of the alveolar bone during alveolar socket preservation using a high-density polytetrafluorethylene membrane (d-PTFE)

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During the alveolar preservation procedure, the socket is filled with a xenogeneic biomaterial and covered with a collagen or synthetic membrane. When synthetic d-PTFE membranes are used, they have to be removed in the 4th week, which can cause bacteria to enter the implant bed and thereby compromise osteogenesis.
The goal of this study was to determine the percentage of newly formed bone and residual biomaterial, and to analyse the immunohistochemical expressions of BMP-2 and TNF-α in the bone specimens.
The tooth socket was filled with a mixture of xenogeneic biomaterial and autologous bone(BX+AB), and covered with a Cytoplast or Permamem membrane. Bone volume (BV/TV, %) and residual biomaterial (RB, %) were determined as well as the expression of BMP-2 and TNF-α.
The BV/TV values were slightly higher in the Cytoplast membrane group (60.86 ± 10.11%), compared to in the Permamem membrane group (59.79 ± 9.93%). The intensity of the TNF-α expression was similar for both membrane groups, with values of 170.62 ± 6.56% for Cytoplast and 176.36 ± 5.56% for Permamem. Higher intensity of the BMP-2 expression was found in the Cytoplast membrane group (176.08 ± 9.43%) compared to the Permamem membrane group (168.94 ± 7.12%).
The high bone volume indicates to excellent osteogenic properties of the BX+AB and optimal biocompatibility of both d-PTFE membranes. The intensity of BMP-2 expression is similar in both membrane groups, indicating good osteoinductive properties of the XB+AB. On the other hand, the intensity of TNF-α expression suggests active bone remodelling.

Key words: Bone regeneration, PTFE, BMP-2, TNF-α, immunohistochemical

P6

Anatomy Preservation Methods – advancements and applications

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Introduction. Conservation techniques are an integral part of morphological sciences and the history begun with mummification of a partially eviscerated body using natron, resin, myrrh and other substances. Later ethanol, carbolic acid, formaldehyde, glycerine and others are added. Liquid preservation techniques of primary fixation, long-term storage preserving natural colours or recolouring specimens' solutions were created.
Methods. The pros and cons of current fixation, preservation and storage techniques will be presented as a review. Currently, efforts are being made to replace or minimize formaldehyde in solution with ethanol, phenol, glutaraldehyde and others. Hard preservation methods are suitable for anatomy teaching. For clinical anatomy courses, soft preservation with the effect of salts and alcohols or fresh frozen material frozen at -18 °C is the best option. Separate group belongs to osteopreparation techniques; cleaning of bones using maceration techniques degreasing and bleaching, preservation, staining, cross-sectional techniques, decalcification, casting of bones or assembly of skeletons. Additionally, methods of tissue impregnation with paraffin, silicone, resins, PEG or glycerine, or embedding in resin or drying or hardening has been developed. The most used is the plastination method. Injection methods using silicones, resins or wax are used to highlight the vascular bed or to create a cast of it. Currently, various silicone-based casting materials are also used to create models.
Conclusions. Proper storage conditions, including controlled temperature and humidity, are essential for preserving anatomical specimens. The general recommendation is to avoid direct ultraviolet radiation, a relative humidity of 50-65% and a temperature of 18-21°C.

Key words: human tissue, fixation and preservation, human tissue storage

P7

Peculiarities of the mesenteric plexus structure

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Aim: This work aims to point out the anatomical variations of the autonomic nervous system (especially in the abdominal region) and their participation in the clinic. In the available literature, we have only found scattered works devoted to this issue.
Material and methods: 20 human cadavers (17 male, 3 females, age range 30-86 years, without any abdominal pathology) were dissected in the supine position bilaterally. Access to the neural structures of the abdominal cavity, including the ANS, was from a longitudinal section in the midline from the xiphoid process to the symphysis, bypassing the umbilicus. After examination and removal of the abdominal organs, the mesenteric plexuses became visible throughout. Increased attention was paid to the renal vessels, urethra, lower mesenteric and gonadal vessels, and plexuses. Aortic plexus dissection allowed us to examine each preaortic nerve to differ intermesenteric nerves from the aortic plexus, from those inside the mesenteric plexus and which we have classified as intraperitoneal branches of the mesenteric plexus.
Results: We observed interindividual differences in the number, size and connections of the superior and inferior mesenteric plexuses: in some cases, 3-4 smaller ganglia or in other cases 1 large ganglion was found. The superior mesenteric plexus is the source of innervation of the appendix. The inferior mesenteric plexus has observed multiple connections with the superior mesenteric, renal, hypogastric and aortic plexuses.
Conclusion: The variabilities in the formations of the superior and inferior mesenteric plexuses should be taken into account when concerned about the abdominal organs' innervation.

Keywords: superior mesenteric plexus, inferior mesenteric plexus. variability

P8

Peculiarities of the structure of the cervical part of the sympathetic trunk

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Aim: Atypical signs of the same nerve injury in different people gave rise to the assumption of variability of connections of the autonomic nerves with the surrounding cranial and spinal nerves. Our study was aimed at revealing the autonomic nervous connections and construction variability in the cervical region. The cervical region is frequently approached for various medical procedures.
Material and methods: 20 human cadavers (17 male, 3 females, age range 30-86 yrs, without any cervical pathology) were dissected in the supine position. The cervical parts of the vagus nerve, sympathetic trunk and spinal nerves were revealed bilaterally.
Results: Anastomosis between the sympathetic trunk and the recurrent laryngeal nerve was observed in 7 cases (35%). An anastomosis between the vagus nerve trunk and the cervical part of the sympathetic trunk was in 5% of cases and anastomosis with the phrenic nerve (n. phrenicus) was observed in 10%. A plexiform anastomosis between the phrenic nerve (n. phrenicus) and the stellate ganglion (ganglion stellatum) occurred in 20% of cases. The lower cervical ganglion was present in 20% of cases; in the majority (80%) it was associated with the upper thoracic ganglion – the ganglion stellatum. Right–left asymmetry of these autonomic ganglia number, their structure and connections were observed.
Conclusion: The presence of observed variable autonomic nervous connections, additional ganglia, and connections in the course of rami communicantes, right-left asymmetry structural differences in the cervical part of the sympathetic trunk influences the generally accepted pattern and ought to be taken into medical consideration.

Keywords: cervical sympathetic trunk, structure, variability

P9

Anatomical Variations in the branching pattern of Left Sided Aortic arch (LSAA): A Systematic Review and meta-analysis

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The typical LSAA pattern encompasses brachiocephalic trunk, common carotid artery, and subclavian artery from proximal to distal. LSAA variants are linked to pathologies and post-operative complications, therefore, understanding of potential variants can help devise personalised care. This review aims to estimate the prevalence of all LSAA variants and investigate influencing factors.
A systematic search of major databases was performed. The pooled prevalence was estimated with a 95% confidence interval. Meta-regression analysis was conducted to evaluate the effect of the subject's sex, geographical location, study modality or slice thickness of the scanner on the prevalence of the five commonest LSAA variants.
A total of 63 studies (n= 33267 arches) were included, and 39 different LSAA variants were identified. Based on the prevalence estimates, approximately 78.3% (95% CI 81.7-74.6) of the population is expected to have a typical three-branched aortic arch configuration. Atypical variants included bovine arch with a prevalence of 14.5% (95% CI 11.6-17.7), aberrant left vertebral artery (ALVA) in 3.1% (95% CI 2.3-4.0), coexistence of bovine and ALVA in 0.55%, and aberrant right subclavian artery was detected in 0.5%. The meta-analysis showed that the subject's geographical location and slice thickness are statistically significant moderators of estimated prevalence.
This review provides a novel approach to understanding the additional factors affecting detection of LSAA variants. The findings suggest that the prevalence of LSAA variants is significantly affected by geographical region and the slice thickness of the scanner. Clinicians should consider these factors when evaluating vascular anatomy to avoid missing potentially high-risk variants.

Keywords: Anatomical variation, Arch of aorta, Meta-analysis

P10

Posterior Antebrachial Cutaneous Nerve Surgical Anatomy

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Aim: To highlight the clinical significance of the anatomical course of the Posterior Antebrachial Cutaneous Nerve (PABCN) within the radial groove of the humerus during surgery.
Case Presentation: A 36-year-old female patient sustained a Holstein-Lewis type fracture in the distal third of the humeral shaft. For the fracture fixation, we performed a posterior triceps-split approach. After the meticulous exposure of the humeral shaft, we observed that the radial nerve was entrapped between the fracture fragments. Despite disengaging the radial nerve, the fracture reduction was not acceptable. The approach was extended, revealing a second nerve, parallel to the radial nerve and of similar diameter, also entrapped. We identified it as the PABCN and exposed both nerves to carefully place the fixation plate. After the operation, the sensory and motor innervation of the radial nerve, as well as the sensory innervation of PABCN, remained intact.
Discussion: PABCN is the sensory branch of radial nerve innervating the skin of the dorsolateral forearm. Its significant similarity and proximity to the radial nerve accents the complexity of entrapment scenarios in distal humeral fractures, necessitating careful exposure and fixation to preserve both nerves' functionality.
Conclusion: The anatomical relationship between the radial nerve and the PABCN should be familiar to every upper limb surgeon to safely perform the exposure of the lower third of the humerus through the posterior triceps-split approach and reduce the humeral fracture without jeopardizing the PABCN or radial nerve.

Keywords: posterior antebrachial cutaneous nerve, posterior cutaneous nerve of the forearm, radial nerve, nerve entrapment, Holstein-Lewis type fracture

P11

The perceived impact of participation in near-peer teaching and social media team in expanding human anatomy knowledge

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Human anatomy is crucial in the current medical curriculum, being fundamental for the development of a solid knowledge background for medical students. However, there is an ongoing debate concerning the optimal method of anatomical learning. This study aimed to investigate the peer tutors' perceptions regarding their participation in anatomy near-peer teaching (NPT) and to assess a newly established Social Media Team (SMT) dedicated to online anatomy education by its members. Overall, 28 undergraduate medical students participated in the study. Students were assigned into two groups. Group 1 (n=12) comprised third- and fourth-year undergraduate medical students participating as peer tutors aiding the laboratory exercises of Topographical Anatomy. Group 2 (n=16) were third-year undergraduate medical students, who were exposed to the full first-year operation of the SMT. Students' perceptions were investigated via anonymous 5-point Likert-scale questionnaires. Peer tutors' responses indicate positive effects on all aspects of NPT (mean score > 3), especially concerning anatomical understanding and the experience regarding the educational environment (mean score > 4). Moreover, members' responses indicate positive effects on all aspects of SMT (mean score > 4). The findings suggest that the proper integration of such modalities could greatly enhance anatomy education, expanding the anatomical knowledge beyond the course's scope.

Key words: near-peer teaching, anatomy teaching, web-based learning

P12

Infrahyoid muscles: are they useful after all?

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Introduction: The infrahyoid muscles are organized into two layers, overlying the neck organs: the
superficial layer (sternohyoid and omohyoid), and the deep layer (sternothyroid and thyrohyoid). They are encased inside the visceral space of the neck, that is delimited by the
middle cervical fascia layer and contains the vital structures of the neck: the cervical viscera,
their related nerves and the upper sympathetic trunk. They participate in the dynamic movements of the hyoid bone and larynx, during speech and swallowing, influencing voice
quality. The ansa cervicalis provides their innervation.
Discussion: The strange phenomenon of the infrahyoid muscles being the only striped muscles
appearing inside a visceral space and lacking a separate fascia, maybe suggests an embryonic
link to the intrinsic tongue muscles and the diaphragm. Prolonged infrahyoid electrical activity is documented during conditions such as tonsillitis, tonsillectomy, thyroidectomy
and dysphagia. Their only clinical presentation is the infrahyoid muscle syndrome, a condition of unknown aetiology, characterized by a palpable lump in the neck that appears
during swallowing. They are effective myocutaneous flaps in surgical reconstructions, and
their nerves are commonly used for reinnervation in cases of recurrent laryngeal nerve injury. On the other hand, their damage during neck surgery or the dissection of the ansa
cervicalis are rather usual events, with little consequence.
Conclusion: The infrahyoid muscles exhibit limited function, they are frequently sacrificed during surgery and yet they may prove to be useful in certain surgical interventions. Exploring their
usefulness potential remains a compelling avenue for future research.

Key words: strap muscles, neck surgery, ansa cervicalis

P13

Luteolin protective effect on cerebellar changes in a rat model of autism: histological and behavioural study

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Introduction: The purpose of this study was to investigate the effects of Luteolin, a natural flavonoid, on autistic-like behaviours induced by sodium valproic acid (SVP) injection in a rat model of autism spectrum disorder (ASD). The researchers aimed to examine the potential contributions of oxidative stress and histopathological alterations to these behaviours.
Methods: The study involved 30 male rat offspring that were divided into different groups, with SVP and Luteolin administration at specific time points. Neurobehavioral tests were conducted, and the cerebellar tissues were analysed for oxidative stress and pro-inflammatory cytokines.
Results: The results showed that SVP administration led to a decrease in neurobehavioral performance, increased levels of malondialdehyde (a marker of oxidative stress), and impairment of glutathione peroxidase in the cerebellar tissues. The expression of interleukin 17 (IL-17), a pro-inflammatory cytokine, also increased significantly. However, treatment with Luteolin significantly improved neurobehavioral alterations, oxidative stress markers, pro-inflammatory cytokine levels, and cerebellar histological structures.
Conclusion: Based on these findings, the study suggests that Luteolin has neuroprotective properties in an animal model of autism. Therefore, it may hold promise as a therapeutic agent for the treatment of ASDs.

Key words: Luteolin, cerebellum, behaviour

P14

Implementing Formative Assessment in Human Anatomy Practical Sessions: Medical Students' Perception and Effect on Final Exam Performance

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Formative assessment with feedback is part of the assessment program in medical education to improve students' learning. This study aimed to examine medical students' perceptions of formative assessment conducted after practical anatomy sessions of integrated body systems-based educational units and explore its influence on final practical exam performance. A descriptive, cross-sectional study was conducted. Data was collected from Year 2 medical students through a survey that addressed their perception of formative assessment and feedback during practical anatomy sessions. The survey employed a 5-point Likert scale. Two open-ended questions were appended in the survey. Students' performance in Unit 3 (where formative assessment was conducted) was compared to their performance in Unit 2 (where no formative assessment was conducted) and with the performance of the previous academic year's students in Unit 3 (where no formative assessment was conducted). Responses to open-ended questions were counted, categorized as themes. The survey showed high internal consistency and validity was established through exploratory factor analysis. The results showed that the mean mark for the unit with formative assessment and feedback was significantly higher than for the units without formative assessment. The students had a positive perception of formative assessment conducted after practical anatomy sessions. The students reported useful insights regarding the benefits of formative assessment and feedback and constructive suggestions for future improvements. The findings indicate that the students positively perceived formative assessment and feedback after practical anatomy sessions. The findings also refer to a positive effect on students' performance in summative practical assessment in anatomy.

Key words: Anatomy education, anatomy practical sessions, formative assessment, feedback, exam performance

Acknowledgments: I would like to express our gratitude to the students who honestly participated in the study. I also want to thank the college administration for their support and facilitation of the data collection process.

The study was approved by the Research and Ethics Committee of the CMMS-AGU (Approval number: E23-PI-5-23). Informed consent was obtained from all participated students.

P15

The History and futures of Teaching Anatomy at the Faculty of Medicine in Rijeka

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“Doctors without anatomy are similar to moles: they work in the dark and their daily tasks are mole hills “. – Friedrich Tiedemann. This paper emphasizes the importance of anatomy as a fundamental and core subject in medical education, highlighting the necessity of striking a balance between traditional teaching methods, such as cadaver dissection, and new digital technologies in anatomy learning. An understanding of anatomy is essential for future medical professionals as it requires a deep comprehension of the human body. Traditional methods like cadaver dissection provide invaluable experience in directly investigating the three-dimensional structure of organs and tissues, enabling students to gain an intuitive understanding of anatomy. However, digital technologies such as digital anatomical tables offer interactive learning and easy access to detailed anatomical visualizations, enriching the educational experience and encouraging student engagement. It is important to note that despite the advancements in digital technologies, practical experience in cadaver dissection should not be disregarded. Cadaver dissection allows students to develop a profound understanding of anatomy and acquire important clinical skills. Therefore, to ensure that medical education is comprehensive and tailored to the needs of future clinical professionals, it is crucial to maintain a balance between traditional anatomy teaching methods and the innovations brought by the digital age. Integrating traditional and digital methods enables students to fully utilize their educational experience and prepare themselves for the challenging field of medicine.

Key words: anatomy teaching, cadaver dissection, Faculty of Medicine in Rijeka, history of anatomy

P16

Enhancing Neuroanatomy Education Through Peer-to-Peer Teaching: Insights from the Welsh National Neuroanatomy Teaching Series

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This study aims to explore the effectiveness of a peer-to-peer teaching series, integrated with expert-led sessions, in enhancing neuroanatomy education. The Welsh National Neuroanatomy Teaching Series (WNNTS) comprised six online sessions supplemented by a final in-person event. Each online session combined peer-to-peer learning with guest speakers (academics or clinicians) providing clinical insights. Participant feedback forms were collected and analysed. Feedback from participants indicated high levels of agreement regarding the efficacy of the combined peer-to-peer and expert-led teaching approach. Notably, 95% found the combined teaching method facilitated easier understanding of anatomy, and 97% felt it helped consolidate prior knowledge. Moreover, 97% also reported this approach to teaching made understanding anatomy more engaging and interesting. However fewer attendees (91%) agreed that the series helped increase their insight into relevant medical specialities highlighting a potential area for improvement. Attendees represented a diverse mix, including 15% preclinical medical students, 13% clinical medical students, 23% allied healthcare professionals, and 49% biomedical and allied healthcare students. The WNNTS demonstrates the effectiveness of integrating peer-to-peer learning with expert-led sessions in neuroanatomy education. This approach enhances engagement, comprehension, and retention of anatomical knowledge across diverse medical disciplines. The study highlights the value of collaborative learning environments in medical education and suggests its potential to supplement traditional teaching methods.

Key words: Peer-to-peer teaching, Medical education, Neuroanatomy, Education, Participant feedback

P17

Unravelling the Cribriform Plate Anatomy in an Aged Rat Model

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The global increase in neurodegenerative disorders is associated with aging populations. A decline in open foramina on human cribriform plate (CP) due to bone growth with age was reported. The rat model is widely used to study aetiologies of anosmia and olfactory dysfunction, cerebrospinal fluid drainage, and nose-to-brain drug delivery. However, the characterization of CP in elderly rats is lacking in the literature.
Fifteen Wistar female cadavers, ~2.5 years old, were studied. Each skull was prepared to expose the cranial cavity and isolate CP. Anatomical preparation by slow maceration and bleaching was performed, and CP caudal surfaces were photographed. Parameters were measured using Image J software and analysed.
Paired t-test revealed no significant differences between CP's left and right sides and for further analysis each side (N=30) was considered independently. The mean ± standard deviation of CP area was 12.0±0.2mm2, CP Foramina number was 56±3.3, and the percentage of CP area occupied by foramina was 8.3±0.6. We found 38.3±1.8% foramina closed by a thin layer of bone, located predominantly dorsally, near Crista Galli.
Differences between these results and those reported in the literature may be a consequence of aging in our sample. Disruption of neural communication between olfactory epithelium and bulbs could cause olfactory dysfunction and anosmia. Further research is needed to clarify the relation of these results with decreased solute transport via the olfactory pathway, hindering nose-to-brain pathway efficiency and waste removal from the aging brain, responsible for neurotoxic substance accumulation associated with age-related cognitive decline and neurodegenerative diseases.

Key words: Olfactory function, Neurodegenerative diseases, Cerebrospinal fluid drainage, Aging, Animal models

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P18

The Meningo-Orbital Foramen: A Morphological Study on Dried Adult Skulls

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Aim: The meningo-orbital or cranio-orbital foramen (MOF) represents a bony opening in the lateral orbital wall, adjacent to the superior orbital fissure. The current morphological study aims to investigate the presence of the variant foramen on dried adult skulls from a Greek population.
Methods: One hundred and twenty-three (123) Greek adult dried skulls (246 orbits in total) were bilaterally investigated. The sample was derived from the osteological collections of the Anatomy Departments of the Medical Schools of the National and Kapodistrian University of Athens, and the Aristotle University of Thessaloniki. The mean age of the adult skulls was 50.3 years old (range: 20-91 years).
Results: The MOF was identified bilaterally in 56.05% and was absent in 36.58% (30.89% on the right and 25.2% on the left side). The number of the MOF may vary. One MOF was observed in 29.67% (in 37 right and 36 left orbits), 2 MOF were identified in 16.26% (in 23 left and 17 right orbits), and 3 MOF in 1.63% (in 3 left and 1 right orbit).
Conclusions: The MOF presence was estimated with a pooled prevalence of 48.37%, with a unilateral presence of 73.92%, and a bilateral presence of 26.08%. Contrariwise, in the current study, the MOF bilateral presence was more frequent than the unilateral one. The middle meningeal artery orbital branch courses through the MOF, and anastomoses with the lacrimal artery. Ophthalmic surgeons should be aware of the MOF because it could be a source of intraoperative haemorrhage.

Key words: meningo-orbital foramen, study, dry skulls, neurosurgery

P19

Interspecies variation of the hard palate in selected mammalian groups

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Introduction. The mammalian hard palate, with its bony base, represents the natural boundary between the oral and nasal cavities. Its structure involves the paired incisor bones (os incisivum, premaxilla), maxilla and palatine bone (os palatinum), which are covered along their entire length by mucosa with layered squamous epithelium. The mucosa of the hard palate is not smooth but forms many structures that serve to facilitate the passage of food towards the pharynx. These are mainly rugae palatinae whose size, number and shape are often species specific. The variation is so great within mammals that we decided to compare the macroscopic structure of several different groups, including humans.
Methods. The material for our study was the heads, or rather their hard palates, from ten different mammalian groups. These were marsupials, insectivores, rodents, lagomorphs, felids, canids, pinnipeds, artiodactyls, perissodactyls and primates. A total of 87 hard palates, from 20 mammalian species including humans, were measured and compared. The most complex and diverse hard palate structure was found in species with unenclosed dentition and diastemata such as ruminants, rodents and marsupials.
Results. The simpler palate belonged to primates, carnivores and pinnipeds.
From a clinical point of view, for the purpose of surgical interventions or testing innovative methods of palatal plastics, species whose palate is smoother and approximately as long as it is wide are preferable. This is because they provide the surgeon with sufficient manipulation space and mucosa, necessary for, for example, two- and three-flap palatal plastics.

Key words: palatum durum, mammalian hard palate, hard palate morphometry, hard palate surgery

P20

Pushing the Boundaries of Oncology Imaging: Photon-Counting CT, Magnetic Particle Imaging, and AI-Driven Cancer Diagnostics and Therapeutics

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Aim: This literature review aims to provide a comprehensive overview of the latest advancements in oncology imaging modalities, focusing on photon-counting computed tomography (CT), magnetic particle imaging (MPI), and the integration of artificial intelligence (AI) in cancer detection and management.
Methods: A comprehensive literature search was conducted using the PubMed database to identify relevant studies published between January 2018 and April 2023. Studies were included if they reported original research findings or comprehensive reviews on photon-counting CT, MPI, and AI-assisted cancer detection, diagnosis, and treatment planning. Data extraction was performed by two independent reviewers.
Results: The review includes 12 studies that met the inclusion criteria. Photon-counting CT demonstrated improved image quality, increased contrast resolution, and potential for radiation dose reduction compared to conventional CT. MPI, utilizing superparamagnetic iron oxide nanoparticles, offered high sensitivity, spatial resolution, and quantitative imaging capabilities for cancer imaging and treatment monitoring. AI algorithms achieved high diagnostic performance for lung and prostate cancer detection from CT and PET scans, comparable to experienced radiologists. AI-based systems also showed promise in automated tumour segmentation, radiation therapy planning, and monitoring treatment response.
Conclusions: Novel imaging techniques, such as photon-counting CT and MPI, offer improved diagnostic capabilities in oncology, while AI-assisted methods have the potential to enhance cancer detection, diagnosis, treatment planning, and monitoring. However, challenges remain, including the availability of specialized equipment, dependence on large training datasets for AI algorithms, and potential biases. Ongoing research and multidisciplinary collaboration are crucial for successful clinical translation.

Key words: Radiology, Artificial intelligence, Cancer, Diagnosis, Tumour

P21

Quantitative study of the new anatomical structures of the bones of the forearm

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Aim: The aim of the research was to produce an extensive anatomical study of the newly defined structures (tuberositas interossea radii et ulnae) on dry bones and to compare our results with those of the Rougereau et al. (2021) who studied this tuberosity on radiographs, CT scans and cadavers, but they did not include dry bones in their study.
Methods: Our research was divided into three main parts: osteometric, cadaveric and radiological. The osteometric part included the examination of 1125 radii and 753 ulnae of adult non-pathological dry bones. A Somet digital caliper was used to measure the dry bone. The cadaveric part consisted of four dissected forearms (two embalmed cadavers). The SIEMENS Somatom Definition Flash CT scanner was used for the radiological part of the study. Four dry bones were scanned and then the 3D reconstruction was performed using the Neoatom Alpha program.
Results: As in the Rougereau et al. study, both tuberosities were present in 100% of the analysed bones. We divided both the tuberositas interossea radii et ulnae into pars anterior and pars posterior. Both structures serve forh the muscle origins and both tuberosities serve as attachment for the membrana interossea antebrachii. 3D reconstruction of the CT scans showed that it is possible to identify and measure both tuberosities.
Conclusions: Tuberositas interossea radii et ulnae are constant anatomical structures and we can distinguish their main subparts: pars anterior and pars posterior.

Key words: tuberositas interossea radii, tuberositas interossea ulnae, anatomical structure, tuberosity, forearm

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P22

Visualizing Vessels: A Low-tech Approach to Nomenclatural Problems in Variant Anatomy

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Introduction:
Our hypothesis is that our flexible new method of schematic (as opposed to pictorial) representation, inspired by the "wiring diagrams" used by electricians and the "point-and-line labels" used in geometry, can help researchers & students better visualize branching vessels.
We hope that this new kind of visualization will not only reduce the need for brute memorization, by emphasizing the logical relationships between segments of the schematized vessel systems, but also offer ways to expand & improve the existing nomenclature.
Methods:
We apply our hypothesis to one complex vascular system, the hepatic portal vein (and its major variants) in order to test its basic capabilities and flexibilities when applied to variant vessel names in the real world.
Results:
The schematizations shown in our poster illustrate both the range of complexities our method is capable of depicting, and its flexibility in helping anatomists visualize the various relationships between vessels (both "standard" and variant), and between the vessels and their names.
Conclusions:
Nomenclatural problems are amenable to our schematizations, although each vascular system examined will require its own specific modifications.
The immediate significance of our proposed method is its potential application to the currently burgeoning subfield of "variant anatomy:" by efficiently labeling vascular branches, we provide a kind of "scaffold" on which useful names for variant structures might eventually be built.
In the longer term, necessarily adapted versions of the basic idea should help in the labelling of other "branching" systems (perhaps muscles & nerves, for example), and maybe even of other systems whose organization is analogous to branching (the bones of the wrist, hand, and fingers, for example). Finally, it may be that the real triumph of the "wiring diagram" approach will be in the realm of neuroanatomy.

Key words: vasculature variation, terminology

P23

Ultrasound Assessment of Hip Joint Osteoarthritis in the Rabbit Model

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The value of the rabbit as an animal model of human hip osteoarthritis and the emerging demand for generating feasible therapeutic approaches turns the development of an ultrasound-scanning protocol to monitor this musculoskeletal disorder in the rabbit of utmost importance to translational research under the One Medicine concept.
The objectives were to describe an ultrasound-scanning protocol, comparing different ultrasound approaches to the hip joint in cadavers free from hip abnormalities and in vivo osteoarthritic joints of rabbits.
New Zealand male white rabbits were studied. Firstly, eleven 14-week-old cadavers free from hip abnormalities, euthanized for reasons unrelated to the present study, were studied. The ultrasound-scanning protocol included a ventral approach, with sagittal and transverse planes, and a dorsal approach with dorsal and transverse planes. The acetabulum, femoral head and neck, Joint capsule, synovium profile, and ligament teres were evaluated. Then, the ultrasound-scanning protocol was applied to five osteoarthritic hip joints of 20-week-old rabbits in vivo with surgically induced osteoarthritis in the left hip confirmed by computed tomography.
The present study showed that the ultrasound-scanning protocol, employing various planes complementarily, enabled a complete and detailed evaluation of the hip joint sonoanatomy in rabbits, supporting the clinical application of ultrasound in this region. The ventral transverse plane allowed the identification of a greater number of joint structures. The applicability of the protocol developed in osteoarthritic joints was confirmed, granting the accurate identification of osseous and cartilaginous defects, offering added insight into monitoring osteoarthritis development, and instigating future therapeutic research, including ultrasound-guided intra-articular administrations.

Key words: Animal model, One Medicine concept, Imaging, Sonoanatomy, Musculoskeletal disorder
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Stimulus-Institutional Call-CEECINST/00127/2018 UTAD,
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P24

The accessory brachioradialis muscle (brachioradialis accessorius): Prevalence of a rare variant with potential clinical significance

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Background: The brachioradialis muscle (BR) belongs to the radial forearm muscles and contributes to the elbow flexion. Accessory brachioradialis muscle (ABR) or brachioradialis "accessorius" represents an uncommon BR variant, not been enough studied. The present study investigates the incidence of the ABR variant, along with its origin, insertion, and innervation.
Materials and Methods: Eighty-three (83) upper limbs were meticulously dissected at the arm, forearm, and cubital fossa to investigate the ABR presence. When the variant muscle was identified, morphometric measurements were obtained.
Results: The ABR was identified in two upper limbs (2/83, 2.4%), in a male cadaver, bilaterally. Its origin was located along with the typical BR, and its insertion was identified into the anterior surface of the radius. The radial nerve supplied the ABR, having a course posteriorly to it (in a deeper layer).
Conclusions: In the current study, the variant muscle was observed in 2.4%, while the ABR reported incidence is recorded between 0.5-2.8%. Radial nerve compression, at the forearm, is not an uncommon entrapment neuropathy. The relationship between the radial nerve and the ABR could precipitate radial neuropathy.

Key words: brachioradialis muscle, accessory muscle, variation, dissection

P25

Euphrosynos, pleasures of the mortal soul shall render you down to a skeletal remain

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In 2013, archaeologists found a mosaic in a Greek villa (Antioch) of the 1st century BC, depicting a skeleton named Euphrosynos (joyful) preparing for a feast. Human skeletons were rarely used in Greek antiquity, since religious and societal norms considered the human body sacred and ruled it to be untouched. Some reports do exist of Schools of Philosophy, employing human bones for medical education, but skeletal remains in ancient Greek art hardly ever appeared, such as a Corinthian krater depicting the fossils of a chimerical creature. Human skeleton visualizations first appear in the dining rooms of ancient Rome and Pompeii in the Greco-Roman era.
Epicurean philosophy states “enjoy life as much as you can because tomorrow is uncertain”, suggesting that people should run away from daily pains, anxiety and religious worries and pursue pleasure and delight instead. Euphrosynos’ joyful figure probably promotes the epicurean idea of a happy living and declares all earthly pleasures temporary, instant charms of a mortal soul. Furthermore, according to the Hippocratic aphorism that “we are what we eat”, we may assume that medico-philosophers knew the significance of nutritional habits and health, and connected fatality with the skeleton depiction amongst food and wine. Despite all, the accuracy of this skeleton’s construct testifies anatomical knowledge of the Greeks, in an era when Alexandrians had not yet disseminated their work.

Key words: feast, anatomy, Greco-Roman era

P26

Anatomical characterization technique comparison of the mental foramen and mentonian nerve: CBCT and anatomical dissection

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Aim: Evaluate the accuracy of Cone Beam Computed Tomography (CBCT) for the study of the mental region of human cadaveric heads.
Methods: 9 cryopreserved human cadaveric heads were selected for the anatomic study of the mental region. Through CBCT exam and direct observation of the head post-dissection, it was evaluated for each mental foramen: number, shape, location, horizontal and vertical diameter, distance to the superior and inferior border of the mandible and surrounding cortical bone thickness. Data analysis was performed using descriptive and inferential statistics for $p<0,05$.
Results: No significant differences were found between the imagological and direct evaluation of the number, shape and position of the mental foramen ($K=1$; $p<0,05$). Submillimetric differences (<1 mm) were found between the CBCT linear measurements and the gold standard. There was a high correlation ($\rho \geq 0,904$; $p<0,05$) for all the linear measurements, except for the vertical diameter ($\rho=0,813$; $p<0,05$) and the distance from the mental foramen to the inferior border of the mandible ($\rho=0,700$; $p=0,188$). The presence of tooth affected the accuracy of the CBCT when performing linear measurements.
Conclusions: CBCT is a reliable and accurate method for taking linear measurements on the mental region in the presence of soft tissue, and so a valid tool for clinical diagnosis. Further studies are necessary to evaluate other factors that may influence CBCT accuracy and reliability.

Key words: CBCT; linear measurements; mental foramen; accuracy.

P27

How does hyperbaric oxygen treatment affect in regenerating m. Masseter of rat?

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Background: Hyperbaric oxygen treatment was shown to be favorable as an additional therapy for ischemic muscle injuries. Various experimental models served to examine the influence of HBO on the course of muscle repair following some other types of muscle injuries or conditions.
Aim: The aim of this study was to analyse the influence of hyperbaric oxygen treatment on the expression of MyoD and myogenin during regeneration of masseter muscle of the rat.
Materials and methods: In this study we used male Sprague-Dawley rats weighing 200–250 g. They were divided into two groups: the hyperbaric and the non-hyperbaric group. Immunohistochemical and Western blot analysis of frozen masseter muscle were performed for this study.
Results: Results show that myogenic transcriptional factors MyoD and myogenin increased in early period of regeneration in m. masseter oh the rat injected with local anesthetic bupivacaine hydrochloride. The level of MyoD protein expression increased on the second day, was the highest on the third day and then declined. The myogenin protein was detected two days after injury, on the third day the level of expression was the highest and then diminished towards the fifth day.
Conclusion: We have demonstrated that muscle regeneration caused a transient upregulation of MyoD and myogenin transcriptional factors in rat masseter muscle.The role of these transcriptional regulatory factors is important in managing a regenerative response of muscle fibers following bupivacaine hydrochloride injection. The treatments of hyperbaric oxygenation have not altered the expression of myoD and myogenin transcriptional factors in damaged rat masseter muscle.

Key words: hyperbaric oxygen treatment, m. masseter, rat, regeneration

P28

Surgical anatomical study of the lateral femoral cutaneous nerve to minimize neurological complications in the direct anterior approach for total hip arthroplasty

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This study aims to anatomically verify the proximity of the lateral femoral cutaneous nerve (LFCN) to both the bikini and traditional incision lines in the direct anterior approach, to minimize the risk of neurological complications in total hip arthroplasty. Detailed dissections of the anterolateral thigh region were performed on 14 thighs from 7 fresh cadavers (3 males and 4 females). Major bony points such as the anterior superior iliac spine (ASIS) and fibular head (FH), along with incision lines, were marked on the thigh skin. After exposing the trajectory of the LFCN, the shortest distances from each landmark to the stem and branches of the LFCN were measured.
The frequency of the nerve emerging as one stem and then bifurcating into anterior and posterior branches was 50.0 %. The stem of the LFCN averaged a length of 4.9 cm. When examining the lateral vertical line from the ASIS to the FH, the bikini incision was located on average 5.0 cm below, with the LFCN crossing the lateral part of the incision in about 42.9% at a maximum distance of 0.9 cm from the lateral vertical line. In cases of traditional incision, the posterior branch of the LFCN crossed the incision line at various locations in approximately 78.6%.
When the safety zone for the bikini incision was being established to preserve the LFCN, caution was advised within a range of 1.2 cm medially and 0.9 cm laterally from the lateral vertical line connecting the ASIS to the FH.

Key words: Lateral femoral cutaneous nerve, Direct anterior approach, Total hip arthroplasty, Surgical anatomy

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