The orbits are complex structures containing eyelids, extraocular muscles, nerves, vessels, orbital fasciae, and fat. The aim of this study was to reinforce the clinical importance of the orbit by fresh-frozen cadaver dissections. In the study, three adult hemisectioned heads were used. Dissections were done under 3 magnifications. The orbital roof was removed and the periorbita was dissected. The course of the frontal nerve and its supratrochlear and supraorbital branches was observed above the levator palpebrae muscle. The lacrimal nerve coursed above the lateral rectus muscle with the lacrimal artery. The lacrimal gland was found toward the distal part of the lacrimal nerve. The trochlear nerve crossed medially above the levator palpebrae muscle to reach the superior oblique. In the next step, levator palpebrae was separated from superior rectus. Under levator palpebrae and superior rectus muscles, the superior division of the oculomotor nerve was found. There was a fibrous septum extending along the lower border of superior rectus. To expose the optic nerve, the fibrous septum was opened and orbital fat removed. Secondly, ethmoidal air cells were removed in the medial wall of the orbit; the optic nerve, eyeball, and inferior division of oculomotor nerve were then observed. These structures found within the orbit create a complicated field, requiring considerable care to avoid damaging structures.

**Anatomical study of the arterial supply of the extrahepatic biliary system**

Anomalous extrahepatic arterial supply to the biliary system is frequently encountered by surgeons. This study aimed to identify the arterial anomalies of this region and their clinical implications. Twenty cadavers, 10 digital subtractions and a CT image were included in this research. Regarding the cadaveric cases, accessory left or right hepatic arteries were noted in 15% of the sample; a middle hepatic artery was noted in 10%; the cystic artery was either anterior or posterior to the cystic duct in 21 and 79%, respectively. Double cystic arteries were seen in 5%. Angiographic results demonstrated that in 22.2%, the left hepatic artery was replaced, and originated from the left gastric artery. In 11.1%, a replaced right hepatic artery originated from the superior mesenteric artery. In another 11.1% a replaced gastroduodenal artery arose from superior mesenteric artery. The cystic artery branched from the right hepatic artery in 88.8% of the angiographic images. However, it originated from the left hepatic artery in 11.1% of the images. The CT image demonstrated that a common hepatic artery abnormally originated from the aorta. In conclusion, arterial variations of the extrahepatic biliary tree. These findings will help to minimize the likelihood of postoperative complications during hepatobiliary surgeries.

**Demonstration of the clinically important structures in orbital dissection of fresh frozen specimens**

The orbits are complex structures containing eyelids, extracocular muscles, nerves, vessels, orbital fasciae, and fat. The aim of this study was to reinforce the clinical importance of the orbit by fresh-frozen cadaver dissections. In the study, three adult hemisectioned heads were used. Dissections were done under 3 magnifications. The orbital roof was removed and the periorbita was dissected. The course of the frontal nerve and its supratrochlear and supraorbital branches was observed above the levator palpebrae muscle. The lacrimal nerve coursed above the lateral rectus muscle with the lacrimal artery. The lacrimal gland was found toward the distal part of the lacrimal nerve. The trochlear nerve crossed medially above the levator palpebrae muscle to reach the superior oblique. In the next step, levator palpebrae was separated from superior rectus. Under levator palpebrae and superior rectus muscles, the superior division of the oculomotor nerve was found. There was a fibrous septum extending along the lower border of superior rectus. To expose the optic nerve, the fibrous septum was opened and orbital fat removed. Secondly, ethmoidal air cells were removed in the medial wall of the orbit; the optic nerve, eyeball, and inferior division of oculomotor nerve were then observed. These structures found within the orbit create a complicated field, requiring considerable care to avoid damaging structures.
HELEN L. ANSCOMB College of Medicine and Dentistry, James Cook University, Townsville, Australia Can teaching delivery mode lead to ongoing changes in student performance within human anatomy?

In a 6-year MBBS course, students can undertake optional "selective" study in human anatomy during year 3. This subject is an advanced regional and applied study of human anatomy taught through cadaveric dissection. Recently, the offering of this subject has changed from a traditional semester offering (internal study, 13 weeks, 5 h per week) to an intensive "block mode" offering, where students engage in ~60 h of dissection over 2 weeks, outside of semester. No change in student assessment has occurred, only the timeframe of teaching and assessment activities. The block mode study option for this subject has led to a significant increase in student performance within the subject (38% attained HD grade), whilst no significant change in student demographics has been identified (i.e., student GPA, prior study). Preliminary investigations (n = 27) into the change in student performance has demonstrated continued improved performance (using anatomy assessment tasks aligned to the dissection subject) months after finishing the block mode group (n = 25). Students were also surveyed to determine their reflections and perceptions of the subject. Students reported that the combination of mode of delivery and teaching method allowed a deeper study of the subject and greater achievement.

JONATHAN BARTLETT AND JOHN LAWRENCE Department of Anatomy, University of Cambridge, Cambridge, United Kingdom The course of the lateral femoral cutaneous nerve and its implication for supine hip arthroscopy

The lateral femoral cutaneous nerve (LFCN) is the main neurovascular structure at risk during placement of the anterior portal (AP) in supine hip arthroscopy (SHA). In this cadaveric study, we aimed to quantify this risk by examining the course of the nerve and its branches in the lower limb. Forty-five hemipelvises from 39 cadavers were dissected. The LFCN was identified proximal to the inguinal ligament (IL), and its path in the thigh identified. The position of the nerve and its branches in relation to the site of AP placement were measured using Vernier callipers. The AP intersected with the path of the nerve on 38% of occasions. The nerve took an oblique path, and when found not to intersect with the AP portal, was located 5.7 ± 4.5 mm from the portal's edge. We observed a reduction in risk if the portal was moved medially or laterally by 15 mm from its current location. The LFCN is at high risk during SHA and our study emphasises the need for careful dissection during this procedure. We suggest that relocation of the AP 15 mm more laterally or medially will reduce the risk posed to the LFCN.

FAYE BENNETT, DAVID ROBERTS, AND TRUDIE ROBERTS Leeds Institute of Medical Education, School of Medicine, University of Leeds, Leeds, United Kingdom Do medical students want to know more about the lives of body donors? A pilot study

In the United Kingdom, body donors commonly remain anonymous to medical students, with little, or no information about an individual shared. Providing more information has numerous potential benefits, but it is unclear whether it would be welcomed by students. To determine whether medical students would like to learn more about those whose bodies contribute to medical education, at the University of Leeds, three focus groups were carried out with a total of 15 medical students. First year (n = 6), second years (n = 4) and intercalating studies studying for a BSc in Clinical Anatomy (n = 5), took part in this study. Each focus group lasted approximately 60 min. All sessions were audio recorded, transcribed and subjected to thematic analysis. Overall, students expressed a wish to know more about the lives of body donors. The nature of the information students wished to receive was influenced by their prior experience of dissection. Students with more experience (intercalating students) focused on medical history, whereas students relatively new to dissection (first years) were interested to learn more about donors as people. In conclusion, medical students want to receive personal information about body donors. Providing students with detailed donor information could facilitate development of key humanistic values, such as empathy, compassion, and respect.

SEAN J. BOTHAM,1,2 THOMAS S. GRANT,1,2 HARVEY DAVIES,1,2 CHARLES HUTCHINSON1,2, AND RICHARD TUNSTALL1,2 Warwick Medical School, the University of Warwick, Coventry, United Kingdom; 3University Hospitals Coventry and Warwickshire, Coventry, United Kingdom Age-related changes in pelvic and inguinal region anatomy from 0 TO 18 years

This is the first study assessing changes in inguinal region anatomy from 0 to 18 years, which is essential in paediatric urological and abdominal surgery. Anonymised contrast-enhanced CT DICOM datasets of 115 patients (0–18 years, 72 male, 43 female, at least 4 in each age group) had left and right sides analysed in triplicate using Osirix MD. The positions of inguinal region structures and inguinal ligament length were assessed relative to bony landmarks. Positions of the deep inguinal ring and femoral vasculature are represented as a % distance along the inguinal ligament, starting at the ASIS. From 0 to 18 years, the pelvis grew by 114 ± 1% (5.1 cm) vertically and 86 ± 2% (10.7 cm) transversely, and the inguinal ligament grew by 234% (from 4.7 to 15.6 cm). With increasing age, the medial border of the deep inguinal ring moved laterally, with respect to the inguinal ligament, toward its midpoint, whereas the femoral artery and vein both moved medially from a starting position of the midpoint of the inguinal ligament. No left-right side differences were observed. From 0 to 18 years of age the soft tissue anatomy of the inguinal region changes in position as the bony frame of the pelvis grows around it.

DIMITRIS CHALLOUMAS, FIDEL PEAT, AND CECILIA BRASSET The Human Anatomy Teaching Group, Department of Physiology, Development and Neuroscience, University of Cambridge, Cambridge, United Kingdom Discrepancies in descriptions of dermatomal distribution in the shoulder and upper back

A good knowledge of dermatomes is key to accurate localisation of nerve lesions. However, descriptions of dermatomal distribution in the shoulder and upper back vary considerably. In this study, dermatomes drawn as narrow transverse bands in 15 (37%) diagrams; and in 13 (32%) maps were mapped onto 30 anatomy textbooks and 18 medical websites were reviewed to elucidate the extent of such discrepancies. The "regimental badge" area on the superolateral aspect of the arm is clinically significant, as sensory loss in shoulder dislocation is indicative of axillary nerve injury. In 28/48 (58%) diagrams, this was shown to be supplied by C5, whilst C4, C6, and C7 were indicated in 3, 12, and 5 diagrams respectively. However, the accepted root values of the axillary nerve comprise only C5 and C6. A similar lack of clarity exists in the depiction of upper back dermatomes, which were described in only 41/48 (85%) sources. Among several variations, the cutaneous distribution of the posterior primary rami of C5–T1 was shown to be supplied by C5, whilst C4, C6, and C7 were indicated in 3, 12, and 5 diagrams respectively. However, the accepted root values of the axillary nerve comprise only C5 and C6. A similar lack of clarity exists in the depiction of upper back dermatomes, which were described in only 41/48 (85%) sources. Among several variations, the cutaneous distribution of the posterior primary rami of C5–T1 was drawn as narrow transverse bands in 15 (37%) diagrams; and in 13 (32%) maps, the dermatome for C4 adjoined that of T2, with no intervening dermatomes. While confirming the ambiguity surrounding dermatomes of the shoulder and upper back, this study highlights the need for further investigations to achieve more specific delineation.

LAUREN CLUNIE, NEIL P. MORRIS, AND JAMES D. PICKERING Division of Anatomy, Leeds Institute of Medical Education, School of Medicine, University of Leeds, Leeds, United Kingdom Evaluation of technology-enhanced learning resources in anatomy education: Are we doing enough?

An increasing number of educators are utilising a variety of technology enhanced learning (TEL) resources to supplement traditional
anatomical teaching methods, including videos, eBooks and virtual models. Although an increase in availability and integration of TEL resources into blended learning curricula has been observed, there remains a paucity of meaningful evaluation to measure their efficacy. In addition, the lack of a suitable evaluation framework has resulted in a disparity between the types of investigation being carried out within medical education. This systematic review assesses published data on anatomical education using TEL resources against a recently proposed evaluation framework. This 4-level framework intends to support investigators to move away from superficial discussions about TEL resources, toward an evaluation of learner gain, and cost benefit. A total of 129 papers met the inclusion criteria, with the majority (106) basing all or part of their evaluation on student satisfaction surveys. Half (65) achieved more than one level of evaluation in accordance with the framework and none reported all four levels of evaluation. This systematic review reflects the current level of evaluation of TEL resources in anatomy education and hopes to stimulate a discussion on the meaningful impact of TEL resources in anatomical education.

SARA CORDONI,1 ANGUS MACDONALD2, JOHN SHAW-DUNN3, and STUART MCDONALD1 1School of Life Sciences, University of Glasgow, Glasgow, UK; 2Monklands Hospital, Airdrie, United Kingdom

Wall thickness and peritoneal cover in the large intestine: Their relevance in colonoscopy

Colonoscopy carries a risk of perforation of the colon, especially when biopsies are taken. We reasoned that perforations into the peritoneal cavity with consequent peritonitis are most likely where the cover of extraperitoneal fat is least and the wall thinnest. To find these regions, we took, with appropriate consent, six different transverse sections of the large intestine from three embalmed cadavers. On each section, we used AxioVision digital software to measure the surface exposed to peritoneum and the minimum wall thickness. The mean values showed great variation. For example, on a transverse section of the sigmoid colon 71.7 ± 14.4% of the circumference might be covered by peritoneum, and the minimum wall thickness might be 0.8 ± 0.4 mm, but if the individual measurements were plotted on an outline of the colon 9 of the 10 regions most exposed to peritoneum and 11 out of the 17 with thinnest walls were in the rectum, sigmoid colon, ascending colon, and cecum. These are known as common areas for perforation and, because the cover of extraperitoneal fat is low and the walls thin, the risk of peritonitis is also high.

MINE FARIMAZ, SINEM SELVI, HILAL AKDEMIR AKTAS, and MUSTAFA FEVZI SARGON Department of Anatomy, Faculty of Medicine, Hacettepe University, Ankara, Turkey; 2Department of Radiology, Faculty of Medicine, Hacettepe University, Ankara, Turkey

Anatomic study of the angulations of internal carotid artery in CT angiographies

The internal carotid artery is divided into cervical, petrous, cavernous, and cerebral parts. In this study, angulations formed between petrous–cavernous parts and cavernous–cerebral parts of the internal carotid artery were examined bilaterally in mid-sagittal reformatted CT angiographies of 60 anatomically normal patients (31 males, 29 females). Mean value of angulation between petrous and cavernous parts on the left side was 101.18 ± 19.77 mm in females, and 99.63 ± 22.7 mm in males. On the right side, it was 103.45 ± 21.75 mm in females and 99.99 ± 22.19 mm in males. Mean value of angulation between cavernous and cerebral parts was 75.07 ± 12.79 mm in females, and 68.94 ± 13.55 mm in males on the left side. On the right side, it was 79.41 ± 20.56 mm in females and 70.21 ± 15.71 mm in males. No statistically significant differences were observed in between angulations and sex in petrous–cavernous parts and cavernous–cerebral parts of the artery. Additionally, there were no statistically significant differences between angulations of right and left sides. Results obtained in this study will have an important role in surgery of internal carotid artery and its branches. Additionally, during the planning of surgical interventions, these results will help the surgeons have a better understanding of vessel morphology.

FERRO ASHLEY, SHADI BASYUNI, CECILIA BRASSETT, and VIJAY SANTHANAM Human Anatomy Teaching Group, Anatomy Building, Department of Physiology, Development and Neuroscience, University of Cambridge, Downing Street, Cambridge, United Kingdom

Comparison of the expectations of medical and health science students in anatomy education

Anatomy education is a matter for debate. Methods developed in recent years have made these discussions common. In this study, expectations of medical students were compared with health sciences (HS) students. The study was performed in 202 medical faculty and 139 HS students. Questions were grouped into better education with visual materials, conditions of rooms, lecture and practical hours, number of cadavers and models, clinical importance of subjects, contents of lectures, learning anatomy without memorizing, and rotation of lecturers. Twenty percent of medical and 1.5% of HS students wished to have more visual materials; 45% of medical and 29.5% of HS students preferred education in lecture halls with fewer numbers; 10% of medical and 16% of HS students wanted more lecture hours; 62% of medical and 51.5% of HS students mentioned their need for more cadavers and models. Additionally, a few students in both groups wanted to attend lectures with more clinical contents, wished to have more visual materials; 45% of medical and 29.5% of HS students wished to have better learning conditions, increased number of cadavers and models. However, a higher number of HS students wished to minimize memorizing and increase clinical anatomy knowledge.

MINE FARIMAZ, SINEM SELVI, HILAL AKDEMIR AKTAS, and MUSTAFA FEVZI SARGON Department of Anatomy, Faculty of Medicine, Hacettepe University, Ankara, Turkey; 2Department of Radiology, Faculty of Medicine, Hacettepe University, Ankara, Turkey

Determination of reliable reference points to prevent zygomaticofacial neurovascular damage in procedures of the zygoma

Maxillofacial procedures for trauma, deformity and cosmesis commonly require dissection onto the facial aspect of the zygoma. These procedures carry a risk of injury to the neurovascular structures exiting the zygomaticofacial foramen (ZFF). The aim of this study was to determine a “ZFF zone” to enable accurate identification of the ZFF, pre- and perioperatively. Measurements were made on 429 dry skulls, i.e., 858 zygomas. A crossline laser was superimposed on each zygoma to create consistent landmarks for precise mapping of the ZFF. The number of ZFF on each zygoma was also counted. Results showed that the number of ZFF per zygoma ranged from 0 to 4, with a single foramen being the commonest finding (49.8%). With regard to location, 81% of all ZFF on the left, and 83% on the right zygomata were found within a circular “ZFF zone” of 15 mm diameter. In clinical practice, surface landmarks can then be used to allow the surgeon to identify this zone in preoperative planning. In conclusion, this study proposes a novel method to delineate a “ZFF zone” which will be instrumental in preventing injury to the ZFF neurovasculature during zygomatic procedures and in locating the ZFF for nerve blocks.

FURNESS, HUGH, GEORGE MILLER, OLIVER PUTT, and THOMAS LEWIS St George’s University of London, London, United Kingdom


A recent study examined the rate of full-length research article publication following abstract presentation at the British Association of Clinical Anatomists (BACA) annual meetings. The accepted standard
for dissemination of research is peer-reviewed publication following presentation at a national meeting. The primary objective of this study was quantitative assessment of the abstracts presented at the American Association of Clinical Anatomists (AACA) annual meetings with regards to the rate of subsequent full-length publication, and comparison to BACA. All abstracts presented at the AACA annual meetings between 2003 and 2010 were analysed. MEDLINE was searched to identify peer-reviewed publications arising from each presented abstract. In total, 1120 abstracts were presented with 22.9% (n = 257) subsequently published as full-length research papers. The median time to publication was 16 months. It was noted that 11.3% (n = 29) of abstracts were published ahead of presentation at AACA. This study showed the publication rate of abstracts presented at AACA (22.9%) is similar to BACA (20.6%). These rates are lower but comparable to surgical specialty meetings. Further work should try identify any concerning reasons for the reduced rate of abstract publication in anatomy research.

JONATHAN GABRIEL, TITUS MURPHY, JAMES BRITTAIN, MICHAEL REID, JAMIE KRISHNAN, AND CLAIRE SMITH
Brighton and Sussex Medical School, Brighton, United Kingdom
Hyperostosis frontalis interna: An underappreciated phenomenon?

Eighteen cadaveric specimens were dissected at Brighton and Sussex Medical School in 2016 with three skulls out of eighteen found to have morphology consistent with hyperostosis frontalis interna (HFI). HFI is a benign, excessive growth or thickening of cancellous bone on the deep surface of the frontal bone of the skull. Estimates of the prevalence of HFI in the general population range from 5 to 12%, however it is believed to be significantly more common in post-menopausal females (due to an association with prolonged oestrogen exposure), with the prevalence rising to between 16 and 84% in women over the age of sixty. HFI is usually detected incidentally on CT or at autopsy. While HFI is frequently under-reported and has been believed to be of little clinical significance, associations with clinically significant pathology such as hyperostosis secondary to malignancy, fibrous dysplasia and Paget’s disease. Our recommendation is improved record-keeping and teaching in order to increase awareness of this poorly understood phenomenon.

FERHAT GENECI,1 MERT OCAK,1 MUHAMMET BORA UZUNER,1 İLKE MANOLYA ÖZDEMİR,2 SENA GÖRMAN,2 AND HAKAN HAMDI ÇELİK1 1Department of Anatomy, Faculty of Medicine, Hacettepe University, Ankara, Turkey; 2Faculty of Dentistry, Hacettepe University, Ankara, Turkey
The evaluation of the effects on tooth enamel of the solutions that are used to store tooth samples, by using micro CT

In this study, the effect of physiological saline, thymol, and formaldehyde solutions, which are some of the chemicals that are used to conserve tooth samples, on tooth enamel was evaluated with micro-CT. The enamel layer is composed of 95% hydroxyapatite crystals, 4% organic components and 1% water. Only a few chemical solutions have an effect on the enamel layer, due to its structural features. The tooth samples were scanned with micro CT before and after they were immersed in formoldehyde (5%), thymol (0.2%), and NaCl (0.9%) for a week. The tissue volume, bone volume and percentage bone volume data were collected from CTan program and images with 24 micrometre resolution, taken from micro CT, were evaluated. It was found that all of these three situations made no difference on the enamel layer, while some symptoms of rotting and putrefaction appeared on the organic components of the samples that were kept in NaCl (0.9%) solution.

DANIEL HAY, MICHAEL MICHAEL, STEPHANIE COZENS, AND ALISTAIR HUNTER Department of Anatomy, Kings College London Medical School, London, United Kingdom
An unusual right hepatic and cystic artery: A case report

Routine dissection was carried out on a 78-year-old female cadaver. During examination of the vessels originating from the coeliac trunk, both vessels were noted that ran parallel with the common hepatic artery. At a position proximal to the common hepatic duct, the vessel passed posterior to the left hepatic artery, before passing into the substance of the liver. Prated on the way, through the liver, it gave off a cystic artery. The anomalous vessel was thought to be the right hepatic artery with an abnormal origin, as the proper hepatic artery did not bifurcate and we believe this is a previously unreported variation in the hepatic/biliary vasculature. The arterial anatomy of the gall blader and liver is a topic of considerable importance as cholecystectomy is a very commonly performed procedure. It is vital that surgeons are aware of the potential variants, to avoid damaging or removing the incorrect vessel. Interestingly, the cystic artery maintained its position within Calot’s triangle, highlighting the importance of this anatomical landmark. This study shows that in addition to common variants, other vascular arrangements exist, and surgeons must be particularly careful when operating in this highly variable region.

SOPHIE HOWLES, SAJJAD ATHAR, AND NEIL ASHWOOD
Queen’s Hospital Burton, Burton on Trent, United Kingdom
Case report: An inverted palmaris longus accessory muscle

The palmaris longus muscle arises from the medial epicondyle of the humerus and inserts into the palmar fascia. It usually consists of a short muscle proximally and a long tendon distally, although in some cases this arrangement is inverted. The palmaris longus may also be duplicated, muscular, duplicated, or absent altogether. In this case the accessory structure was noted to be inverted, with the subcutaneous fascia of the forearm and inserting into the superficial palmar aponeurosis. There are reports of this variation causing pain and median nerve compression, and symptomatic cases have been successfully treated with surgical excision of the accessory structure. In this case the accessory structure was noted to be inverted, with the muscular section distal to the tendinous part. While there has been reports of accessory palmaris longus muscles causing pain and symptoms of nerve compression, they are generally benign structures, and in some cases may have a function in any future tendon grafting/transfer surgery.

SOPHIE HOWLES, SAMANTHA MCBRIDE, CHRISTOS KITSIS, AND NARESH CHACHLANI
Queen’s Hospital Burton, Burton on Trent, United Kingdom
Case report: Osteoma of a sesamoid bone as a rare cause of hand pain

Sesamoid bones are usually ovoid shaped bones found within tendons on palmar and plantar articular surfaces, where tendons run in close proximity to joints. They are variable in size, shape and location, but in the hand they are most commonly found at the metacarpophalangeal joint of the thumb, interphalangeal joint of the thumb and the metacarpophalangeal joints of the index and little fingers. A 72-year-old gentleman presented with a painful lump in his right hand over the palmar aspect of his 5th metacarpophalangeal joint. The pain had become so severe that it impaired his grip strength causing functional difficulties. X-ray imaging demonstrated the presence of a sesamoid bone, which was excised under local anaesthetic and sent for histology. Macroscopically, the excised lump resembled a mixture of fatty and nodular bony tissue. Microscopically, it showed dense lamellar bone surrounded by collagenized fibrovascular stroma, with morphologic features suggestive of an ivory osteoma. The patient ultimately recovered well from surgery, and to date has had no further
symptoms or functional impairment. Osteoma of a sesamoid bone is a rare cause of hand pain. In this case excision proved to be successful in relieving the pain and improving function.

RACHEL HUNTER and INGRID GOULDSBOROUGH
Faculty of Biology, Medicine and Health, University of Manchester, Manchester, United Kingdom Anatomical variation in the branches of the axillary artery: A dissection study

The axillary artery (AA), which is a continuation of the subclavian artery, supplies the anterolateral chest wall and shoulder girdle. It is divided into three parts by the overlying pectoralis minor muscle: the first part gives rise to the superior thoracic artery (STA); the second part gives rise to the thoracoacromial (TA) and the lateral thoracic (LTA) arteries; and the third part gives rise to the subscapular (SA), the posterior (PCHA) and the anterior (ACHA) circumflex humeral arteries. However, this arrangement is quite variable, and this study aimed to investigate these differences. Twenty-eight upper limbs were dissected and the AA was exposed. Diagrams of the AA and its branches were drawn and documented. Variations were seen in 23 specimens. These included small extra vessels branching off the AA (9 specimens); no branches arising from the second part of the AA (5 specimens); the TA arising from the first part of the AA (2 specimens); and the SA arising high in the second part of the AA (5 specimens). In 3 specimens, a bifurcation of the axillary artery within the axilla was observed. These findings could have surgical implications such as changing procedural technique when carrying out reconstructions of the chest wall.

KIM MATTHEW, LISLEY SALIMIN, NIMALAN SANMUGALINGAM, and ANNE JUETTE
Norfolk and Norwich University Hospital Foundation Trust Radiology Department, Norwich, United Kingdom Adult nonrotation of the midgut: A case report

Nonrotation of the midgut is a congenital condition where there is disruption of the normal embryological development of the bowel. The incidence is around 1 in 500, and is often an incidental finding in late childhood and adulthood. We report a case of an adult patient who presented with a 2-day history of left sided abdominal pain with no other associated symptoms. A computed tomography (CT) abdominal scan demonstrated small intestinal loops located in the right side of the abdominal cavity with large intestinal loops in the left side. A thick walled appendix with fatty stranding was arising from the cecum that was located within the left abdominal cavity. Laparoscopic appendectomy was performed, confirming a gangrenous appendix with pelvic collection. This case demonstrates a patient who presented with appendicitis who incidentally was discovered to have nonrotation of the midgut on CT scan.

THOMAS LLOYD, WEN PENG YONG, and CECILIA BRASSETT
Human Anatomy Teaching Group, Department of Physiology, Development and Neuroscience, University of Cambridge, Cambridge, United Kingdom Comparative analysis of limb anatomy as depicted by da Vinci and Vesalius, with reference to a modern curriculum

In recent years, there has been growing interest in the anatomical illustrations of Leonardo da Vinci and their relationship to those published by Andreas Vesalius, often known as the founder of modern human anatomy. In this study, drawings of the upper and lower limbs in Leonardo's Anatomical Manuscripts and Vesalius' De Humani Corporis Fabrica were examined. Comparison was made to current anatomical atlases and texts using a similarity index. A similarity percentage was calculated to give an overall percentage similarity score. The analysis was then presented according to the dissection sequence used in our anatomical curriculum. Results showed that the overall similarity percentages for Leonardo’s Anatomical Manuscript A were 73 and 65% for upper and lower limbs respectively, compared to 86 and 93% in Vesalius’ Fabrica. The greatest discrepancies between their works were found in deeper muscle layers and neurovascular structures. Despite previous suggestions that Leonardo’s sketches depicted anatomical features more accurately, the current study would indicate that Vesalius’ work on the limbs was more comprehensive and portrayed a greater detail of morphological anatomy. As many previous comparisons were qualitative in nature, analysis by similarity index is a useful tool that can also be applied to other body systems.

SAMANTHA MCBRIDE, SOPHIE HOWLES, and NEIL ASHWOOD
Queens Hospital, Belvedere Road, Burton-upon-Trent, United Kingdom Case report of failure of transcondylar humeral fracture fixation resulting in pseudoarthrosis

Fractures of the distal humerus account for 2% of fractures in adults, often due to a fall or direct blow to the back of the arm while the elbow is flexed. Surgical management may involve ORIF with K-wires and plates however stable fixation may be challenging. We present a case of a 29 year old male who was involved in a road traffic accident and sustained a nonrotation of the midgut on CT scan. During investigation of a possible clandestine burial, skull fragments were found at the locus. They were soon identified as pieces of sheep.
skull. This demonstration shows the fragments and the corresponding sites on reference sheep skulls. The main learning point for us was that the orbital margins of sheep are irregular, unlike the smooth margins of the human skull, and can easily be mistaken for sutures. Irregular orbital margins are also seen in cattle, deer and horses. It seems to be a feature of orbital margins that project from the general contour of the face. The case reinforced for us the care that is also needed when identifying individual skull bones of animals, as details of their anatomy and their relative contributions to the cranium vary considerably between species. For example in the sheep the frontal bone is extensive and the parietal bone relatively small. The midline frontal suture persists but the sagittal suture between the right and left parietal bones closes soon after birth. In addition, the lacrimal bone forms part of the sheep orbital margin and the anterior part of the palate on each side is formed by a premaxilla.

RICHARD MCLELLAN AND JOANNA MATTHAN Anatomy and Clinical Skills Department, Faculty of Medical Sciences, Newcastle University, Newcastle, United Kingdom Pursuing a career in oral and maxillofacial surgery: A medical student’s experience of head and neck cadaveric dissection

Pursuing a career in oral and maxillofacial surgery (OMFS) requires dual qualification in dentistry and medicine. During the author’s second degree (medicine), the opportunity arose to undertake a 6-week self-selected module in cadaveric dissection, a diminishing resource in both undergraduate and postgraduate education. Using a newly donated cadaver, a portfolio of head and neck dissection specimens was produced using conventional surgical equipment. All dissection was undertaken with a superficial to deep approach, ensuring greatest exposure to the intricate anatomical structures of the head and neck. Progress was regularly reviewed and documented with annotated photographic journal. Specimens produced highlighted superficial muscles of the face and neck, the insertions of platysma, the parotid gland, branches of the facial nerve, and the superficial and deep neck; including the strap muscles, submandibular glands, carotid sheath and recurrent laryngeal nerve. Step-by-step photographic dissection guides were produced that will be used to teach future medicine and dentistry students the anatomy of the head and neck. Research has shown the positive benefit cadaveric dissection can have on the outcomes of surgical trainees. Undoubtedly, the opportunity to undertake hands-on cadaveric dissection and produce teaching-quality specimens will assist in pursuing a career in OMFS.

NICHOLAS MULCHAN,1 PAUL AGUILERA,1 FATIMA JAITHE,1 CORBIN MAH,2 AUDREY LAM,1 JAMES COEY,2 AND SARA SULAIMAN3 1St. George’s International School of Medicine Keith B. Taylor Global Scholars Program at Northumbria University, Newcastle upon Tyne, United Kingdom; 2Department of Anatomy, St. George’s International School of Medicine, Faculty of Health and Life Sciences, Northumbria University, Newcastle upon Tyne, United Kingdom; 3Department of Applied Sciences, Faculty of Health and Life Sciences, Northumbria University, Newcastle upon Tyne, United Kingdom Haemodynamic asymmetry of the common carotid arteries and hand proficiency: An ultrasound study

Cerebral hemispheres are mainly supplied by the ipsilateral carotid arteries. The influence of arterial asymmetry on handedness development has been cited but remains unclear. A recently published study suggests that hand preference is related to common carotid (CC) arterial asymmetry. This study investigates the relationship between the haemodynamic characteristics of the CC arteries and hand preference/proficiency using Doppler ultrasonography. Fifty participants (26 male, 24 female; mean age 2 ± 4.7) completed Edinburgh Handedness Inventory and Target Speed and Accuracy Tests to quantify their hand preference/proficiency. Participants were subjected to 10 min of scanning ultrasonic assessment. The CC arteries were visualized using GE Logic e ultrasound system with a 12L-RS transducer. Peak-systolic velocities, end-diastolic velocities, and arterial cross sectional areas were measured. There was a significant difference in hand preference between left- and right-handed participants (P value < 0.05). Hand preference/proficiency; however, was not influenced by the CC arteries peak-systolic velocities, end-diastolic velocities or cross sectional areas. No significant correlation between arterial flow and hand preference/proficiency was found. Further studies are needed to examine the lateral differences in the blood supply to the brain accounting for the effect of sample size, anatomical variations, and noncardio sources of blood.

JANICE NIX, TARYN KALAMI, STUART CURRIE, JEREMY MACMULLEN-PRICE, IAN CRAVEN, AND DANIEL WARREN Leeds General Infirmary, Great George Street, Leeds, United Kingdom The pterygopalatine fossa—An anatomical and pathological imaging review

This educational poster demonstrates the anatomical detail of the pterygopalatine fossa, through a series of multiplanar and 3D reconstruction CT and MR images. The pterygopalatine fossa is a lipid-filled space that lies between the posterior wall of the maxillary sinus and the pterygoid process of the sphenoid bone. The maxillary division of the trigeminal nerve branches within it. Nerve branches exit via their respective foramina, which are clearly demonstrated on cross sectional CT and multi-planar reconstruction. The anatomy of the pterygopalatine fossa is complex, but detailed knowledge and careful radiological review is vital to identify pathologies within this region. Knowledge of normal anatomy and radiological identification of pathology within many anatomical sites. This is clearly demonstrated in the pterygopalatine fossa, and is highlighted through images of normal anatomy and pathology. The poster includes advanced imaging techniques, such as inverted CT and fat saturation MR, that allow us to take advantage of the presence of fat. Case examples from our institution, including lymphoma, adenoid cystic tumour, nerve sheath tumour, meningioma, metastatic disease and fibrous dysplasia, are included to demonstrate key pathologies related to this site.

MERT OCAK, FERHAT GENEÇI, MUHAMMET BORA UZUNER, AND HAKAN HAMDI ÇELIK Department of Anatomy, Faculty of Medicine, Hacettepe University, Ankara, Turkey Colorful three-dimensional reconstruction of micro-CT images of the primary teeth and permanent molar teeth

In the last 50 years, there have been huge developments in the scanning methods used both in teaching and in recognizing diseases. The spatial resolution of computed tomography (CT) is 1–2 mm, i.e., 1–10 mm³ voxel (three-dimensional pixel). Meanwhile, microtomography (micro-CT) enables a spatial resolution smaller than 10 μm (μm), which reaches down to 1 × 10⁻⁶ mm³ voxel. In this research, after taking micro-CT views of the primary teeth and permanent molar teeth, we evaluated them in the sagittal, coronal and axial planes. The samples were scanned in micro-tomography (micro-CT) (SkyScan1174, SkyScan, Kontich, Belgium) at 800 microamperes (μA), 50 kilovolt (kV), and 15–21 μm pixel. The rotation step of the micro-CT was arranged as 0.7° and each of them was arranged to scan at 4000 ms exposure time and 180° rotation. The reconstruction of data that were gathered from the scanning was conducted via NRecon software. During reconstruction, the beam hardening correction was adjusted at 20%, ring artefact reduction at 6% and images were reconstructed using the NRecon software. The three-dimensional images were digitally obtained. It is thought that these images will be useful both in anatomical and dental research, as well as in teaching.
JAMES PARKER AND DAVE ROBERTS Faculty of Medicine and Health, University of Leeds, Leeds, United Kingdom The subclavian–axillary arterial tree (in relation to rotator cuff perfusion and reconstructive perforator flap formation)

The aims of this study were to review the typical anatomy of the subclavian–axillary arterial tree, discuss variations and its purpose as a nutrient vessel to the plexus of the skin, thereby understanding the formation of perforator flaps and investigating their nomenclature and classification. A male and a female cadaver were dissected displaying the subclavian–axillary branching pattern and its relationship to surrounding structures. The dissections were photographed and studied to assess any variability in branching patterns. A review of previous studies showed common variable branching patterns. The history of the perforator flap was analysed to provide an insight into its development. Literature detailing variations of the subclavian–axillary arterial tree highlighted both common and rare variations. Perforator flap classification and nomenclature received input from many authors. The ‘Gent’ consensus was held, in an attempt to standardise terminology, a series of definitions was produced to aid this. Standardising both anatomical vasculature and perforator flap nomenclature will improve communication between surgeons and consequently develop surgical understanding, and help to avoid difficulties in inter-study comparisons.

EDGARDO PICARDI,1,2 ENRICO EDOARDO,1 VERONICA MACCHI,1 ANDREA PORZIONATO,1 VINCENZO FIGARRA,2 AND RAFFAELE DE CARO1 1Institute of Human Anatomy, University of Padova, Padova, Italy; 2Urologic Unit, University of Udine, Udine, Italy Brodel's line: An anatomical variation and potential clinical sequelae of hiatus hernia.

The division of the renal artery into anterior and posterior branches implies the existence of an avascular plane: Brodel's line. This longitudinal zone is described along the convex renal border or just posterior to the lateral aspect of the kidney. The aim of this study was to describe the extension of Brodel's line with reference to the renal segments. Twelve kidneys were injected with acrylic resin to obtain vascular corrosion casts that were analyzed with computed tomography. We observed the presence of a relative avascular plane in all vascular casts, located on the posterior surface, ascribable to Brodel's line. In 33% of cases the line extended from the apical to the inferior segments, in 33% of cases it extended beyond the superior to the inferior, and in 33% of cases it was limited to the superior and middle segments. Since Brodel's line corresponds with the plane of the anterior surface of the posterior hilar calyces, knowledge of its extension from the surgical point of view: this plane permits a relatively safe access route to the pelvicalyceal system for nephrostomy insertion, and incision within this plane results in significantly less blood loss than outside this plane.

MARCUS RAULT AND TOM MARSHALL Norfolk and Norwich University Hospital, Norwich, United Kingdom Bilateral synostosis of capitae and trapezoid, a rare case in a 47-year-old female

Synostosis of the carpal bones is the rare occurrence of fusion of two adjacent carpal bones. This may be congenital as part of a genetic syndrome (such as Ellis–van Creveld Syndrome), a sporadic idiopathic case or acquired secondary to an inflammatory, neoplastic or traumatic process. Bilateral hand radiographs were taken of a 47-year-old woman's hands from the rheumatology clinic. Clinical information: ‘known myeloma, generalised joint pain’ (bilateral foot and left knee and patella radiographs were also obtained contemporaneously and were normal). A symmetrical appearance of complete bone fusion of the capitae and trapezoid was seen bilaterally with no other abnormalities. In this case it’s unlikely that the patient’s more generalised joint pain is related to the synostosis, particularly as the appearances suggest the fusion has been present for a very long time. Symptoms of synostosis are more typically to do with movement limitation or are positional. Although it is possible to have fusion of any two adjacent ossification centres in the wrist, it is most commonly lunate-triquetral with capitae-hamate (particularly in Apert syndrome), trapezium-trapezoid, scaphoid-trapezium, and scaphoid-lunate also occurring more frequently. There have only ever been a few cases of capitae-trapezoid synostosis recorded.

JOSEPH ROTHSTEIN,1 CONNOR SMITH,1 ERENE ABDELMESEEH,1 MICHAEL SALVIAN,1 ARJUN PALWAL,1 LAUREN PARR,1 JAMES COEY,2 AND SARA SULAIMAN3 1St. George’s International School of Medicine Keith B. Taylor Global Scholars Program at Northumbria University, Newcastle upon Tyne, United Kingdom; 2Department of Anatomy, St. George’s International School of Medicine, Faculty of Health and Life Sciences, Northumbria University, Newcastle upon Tyne, United Kingdom; 3Department of Applied Sciences, Faculty of Health and Life Sciences, Northumbria University, Newcastle upon Tyne, United Kingdom Ultrasoundographic investigation of ulnar nerve cross-sectional area in musicians and non-musicians

Ultrasoundographic assessment of the ulnar nerve (UN) is used to diagnose various UN entrapment neuropathies, however, there is a lack of consistency in the techniques described in the literature. Prolonged repetitive use of the upper limb, such as in playing music, has been associated with an enlarged UN. This study aims to (i) identify the effect of elbow position on ultrasonographic measurements of the UN; and (ii) evaluate the cross-sectional area (CSA) of the UN in musicians and nonmusicians. Ulnar nerve CSA was measured bilaterally at the level of the medial epicondyle using a GE LOGIQ e system with a 12L-RS transducer; in 32 musicians and 35 nonmusicians (mean age: 24.20 ± 6.9 years). Measurements were taken following two established techniques with different elbow positions (fully extended; 90° flexed). There was no significant effect of the elbow position on the measurements of the CSA of the UN. No significant difference was found between musicians and non-musicians; however, body mass index and sex were shown to affect the CSA measurements of the UN (P < 0.05). Our study supports the validity of two distinct techniques for visualizing the UN using ultrasonography. Future studies are needed to investigate obesity as a risk factor for UN neuropathy.

HANNAH RUSSELL King’s College London, London, United Kingdom Case report and review: Irreducible hiatus hernia

The author considers a case of irreducible hiatus hernia in a ninety-two year old male cadaver. Hiatus hernia is a common finding with a range of potential clinical sequelae. Many patients report no symptoms; others may suffer with the consequences of lower oesophageal sphincter and peristaltic incompetence or gastrointestinal obstruction should the hernial sac become incarcerated. The individual in question reportedly died from pneumonia. An increased risk of aspiration pneumonia is observed in patients with hiatus hernia. No causal link is explored here. At dissection, there was no evidence of surgical intervention. The pyloric antrum and a short length of stomach body were observed inferior to the diaphragm; approximately 2/3 of the gastric sac lay in the thoracic cavity alongside a shortened oesophagus. This herniation was irreducible. All major vessel groups relating to the supradiaphragmatic stomach (left gastric, left gastroepiploic, and short gastric) were markedly distorted with apparent constriction on passing through the oesophageal hiatus and increased longitudinal tension most notable in the left gastric vessels. Vessel lengths were taken for histological examination; mural hemosiderin an assumed marker of vascular injury in life. The case raises interesting points of anatomical variation and potential clinical sequelae of hiatus hernia.
MARELIZE SCHOEMAN, ALBERT VAN SCOOR, AND PEET DU TOIT Department of Anatomy, School of Medicine, Faculty of Health Science, University of Pretoria, Pretoria, South Africa The creation of an arterial anatomy reference data set for a South African population

Arterial pathology contributes to cardiovascular diseases and mortality. During the process of ageing, the structural and functional properties of arteries are altered. The arterial lumens increase with age and thus the arterial diameter could be used as an indicator for the overall ageing process. Researchers have also reported sexual dimorphism in arterial dimensions for several arteries. The aim of this study was to evaluate the influence of different demographic variables on variations in arterial anatomy in a South African population. Arteries were measured at 19 different sites on 190 cadavers and reference data sets were compiled regarding these variations. As expected, females had smaller arteries than males. The coronary arteries also showed a statistically significant difference between left and right, with the left coronary artery being larger than the right. It was also found that arterial size increased with increases in body size and age, which could have serious clinical consequences. Data on normal dimensions for this population is scarce, but essential when evaluating arterial pathology. Knowledge of the normal dimensions at specific arterial sites could therefore contribute to early diagnosis and intervention for a variety of cardiovascular conditions.

ADAM SCIACCA AND BIPASHA CHOUDHURY Faculty of Life Sciences, University of Manchester, Manchester, United Kingdom Entrapment of the sural nerve in the medial head of the gastrocnemius

The sural nerve (SN) is a sensory nerve of the posterolateral leg, foot, and fifth toe. Pathology of the SN has been previously documented and there are many different causes, including: increased calf muscle mass, local scar tissue, and external pressure. The aim of this cadaveric study was to establish the most common formation of the SN, which is frequently described as the union of the medial sural cutaneous nerve and the peroneal communicating branch of the common peroneal nerve, and to document any anatomical variations encountered. In 28% of the 18 cadavers used in the study (n = 5) the MSCN pierced the medial head of the gastrocnemius muscle. The nerve entered the muscle and was encased in muscle fibres before exiting the distal end of the muscle. In the remaining 72% of cadavers, the MSCN coursed superficially to the medial head of the gastrocnemius. The high proportion of cadavers found with this variation in which the SN passed through the gastrocnemius may explain the paraesthesia experienced by some athletes who complain of calf pain. Although the condition is considered uncommon, they may be suffering from SN entrapment.

ADAM SCIACCA AND BIPASHA CHOUDHURY Faculty of Life Sciences, University of Manchester, Manchester, United Kingdom Trifurcation of the sciatic nerve: A case study

The sciatic nerve arises from the sacral plexus and travels distally in the posterior thigh before bifurcating into the tibial and common peroneal nerve at the superior angle of the popliteal fossa. Having a sound knowledge of the sciatic nerve is important for many clinical procedures, for example, when performing a nerve block. The aim of this study was to investigate the level of bifurcation of the sciatic nerve in 18 cadavers. In 44% (n = 8) of the cadavers the sciatic nerve bifurcated in the glutal or thigh region proximal to the superior angle of the popliteal fossa. In the remaining 56% of cadavers the sciatic nerve bifurcated at the superior angle of the popliteal fossa as expected. In one cadaver a trifurcation of the sciatic nerve was seen. The terminal end of the nerve divided into the tibial nerve, the common peroneal nerve and the peroneal communicating branch. The peroneal communicating branch normally arises from the common peroneal nerve. The peroneal communicating branch coursed distally in the posterior leg and united with the medial sural cutaneous nerve to form the sural nerve. Trifurcations of the sciatic nerve are considered rare and may have important clinical consequences.

SINEM SELVI,1 HILAL AKDEMIR AKTAS,1 MINE FARIMAZ,1 MUSTAFA FEVZI SARGON,1 AND EMRE CAN CELEBIOGLU2 1Department of Anatomy, Faculty of Medicine, Hacettepe University, Ankara, Turkey; 2Section of Radiology, Karabük University, Karabük, Turkey Morphometric analysis of anterior, middle, and posterior cerebral arteries in computed tomographic angiographies of anatomically normal patients

The anterior and middle cerebral arteries are branches of the internal carotid, while the posterior cerebral artery is a branch of the basilar artery. The anterior and posterior cerebral arteries are important vessels in the formation of the circle of Willis. The aim of this study was to determine the size of these vessels in total 60 computed tomographic angiographies (30 males and 30 females) were examined. Diameters of the vessels were compared according to side and gender. The mean diameter of the posterior cerebral artery was 1.78 ± 0.07 mm on the right and 1.81 ± 0.14 mm on the left side. In females, it was 1.76 ± 0.10 mm on both sides. The mean diameter of the middle cerebral artery was 2.23 ± 0.12 mm on the right and 2.47 ± 0.18 mm on the left side in males. In females, it was 2.26 ± 0.09 mm on the right and 2.54 ± 0.12 mm on the left side. In males, the mean diameter of the anterior cerebral artery was 1.43 ± 0.08 mm on the right and 1.66 ± 0.12 mm on the left side. In females, it was 1.45 ± 0.06 mm on the right and 1.66 ± 0.08 mm on the left side. In conclusion, knowledge of the morphology of these vessels may have great importance for surgical procedures. An enlarged diameter of them must always be considered for the possible presence of dolichoectasia, aneurysm, and atherosclerosis.

SINEM SELVI, MINE FARIMAZ, HILAL AKDEMIR AKTAS, AND MUSTAFA FEVZI SARGON Department of Anatomy, Faculty of Medicine, Hacettepe University, Ankara, Turkey Electron microscopic examination of fresh frozen cadaver samples: Analysis of tissue ultrastructure

Electron microscopy is one of the most important methods used in the examination of the ultrastructure of biological tissues. In this study, different tissue samples of 10 fresh frozen cadaver head and neck specimens were examined ultrastructurally in order to determine the ultrastructural differences among tissues. The tissues taken from the fresh frozen head and neck tissues were fixed in 2.5% glutaraldehyde, and routine transmission electron microscopic tissue preparation technique was performed to all of the tissues. The transmission electron microscopic examination of peripheral nerves and brain samples showed serious degrees of ultrastructural pathological changes. In the brain tissue, swollen mitochondria, and large intracellular and intercellular vacuoles were the most prominent findings. In the peripheral nerves, separations in myelin configuration were observed in all of the samples. This pathological finding was most prominent in large-sized myelinated axons. In addition, the quality of soft tissues was not good enough for taking transmission electron micrographs. For scanning electron microscopic examinations, the most suitable tissue was found to be the head tissue. In conclusion, only bone samples of fresh frozen cadavers can be examined by scanning electron microscopy. None of the fresh frozen tissues was suitable for transmission electron microscopic examination because of the ultrastructural pathological changes.

BENJAMIN SEPHTON AND JENNY CLANCY University of Leeds, Leeds, United Kingdom Extracervical approaches to thyroid surgery

Advances in thyroid surgery over the last three decades have led to the development of minimally invasive and extracervical approaches predominantly to improve cosmesis. This study aims to demonstrate...
The complex anatomy of the thyroid region and to explore the anatomical structures related to two extracervical approaches, the axillary approach and the anterior/breast approach. Three cadaveric dissections were undertaken to reveal the surgical anatomy of the thyroid gland and the surgical pathways related to the axillary and anterior/breast approach. The first dissection demonstrated the anatomy of the thyroid gland and its relation to structures/landmarks important in thyroid surgery. The second dissection showed the surgical pathway and anatomy associated with the axillary approach to thyroid surgery and the third dissection demonstrated the anterior/breast approach. A flawless anatomical knowledge of the thyroid gland is essential for successful surgical outcome and to minimize the risk of complications. The extracervical axillary approach and the anterior/breast approach have been found to have good surgical outcomes and are associated with limited dissection area.

Findings suggest that ultrasound is a tool to reinforce and contextualise knowledge, and should be utilized toward the end of an anatomy module, following other teaching modalities. Finding suggested significant variation between aims and structure of teaching between facilitators. Some focused on ultrasound skills whilst others demonstrated the anatomy with varying levels of student participation. This highlights the importance of aligning the objectives of the curriculum developers, facilitators and students and having a structure in place to achieve those objectives in order to maximise the value of ultrasound in anatomy teaching.

Clinical and magnetic resonance imaging correlations in patients with symptomatic meniscal tears of the knee

Meniscal tears are among the most common knee injuries presenting to orthopaedic clinics. The data from 104 patients who presented with knee pain and who sequentially underwent clinical assessment, magnetic resonance imaging (MRI) and arthroscopy to treat symptomatic meniscal tears were reviewed. This study aims to identify potential predictors of meniscal tears in order to obviate the need for imaging. Presenting symptoms and signs from clinical examination were quantitatively analysed to determine their association with a final diagnosis of meniscal tear. A logistical regression model was constructed to determine the strength of the relationship between each independent variable and an accurate diagnosis of meniscal tear. A positive McMurray's test, 82% were confirmed as having a meniscal tear on MRI and at arthroscopy. However, in view of the above findings, it is recommended that MRI should still be used in the diagnosis of suspected meniscal tears, in order that unnecessary surgery is not undertaken.

Langer's axillary arch, a rare variant, and prevalence among Caucasians: A case study

During the dissection of a 79-year-old Caucasian female cadaver, a variant of Langer's axillary arch was found unilaterally in the left axilla. While Langer's axillary arches are not uncommon, this particular variant, attaching to the biceps brachii, is much rarer with a reported prevalence of only 0.25%. The case reported here, however, is only the third example of a Langer's axillary arch that has been found in the last 14 years in the Dissecting Room at St George’s University of London, giving it an overall prevalence of approximately 1.0% amongst a population of around 280 Caucasian cadavers, much lower than the reported frequency of 7%. Langer's axillary arches can be completely asymptomatic in life, but may also cause a variety of issues both clinically and surgically.

Clinical and magnetic resonance imaging correlations in patients with symptomatic meniscal tears of the knee

Posterolateral spinal fusion (PLSF) is one of the most frequently used procedures in surgeries related to instability and deformation of the spine. In order to obtain a successful spinal fusion, among all biological factors, grafting is pivotal. Materials such as hydroxyapatite and tricalcium phosphate (TCP), which are synthetic ceramic grafts, are among the reliable materials that are used nowadays. In this study, ten Sprague-Dawley rats were used with the aim of evaluating the PLSF of the L3–L4 segment. The study involved one TCP and one control group. Rats in the first group, after decortication and facetectomy, were treated with TCP as a graft material. Rats in the control group were only applied decortication and facetectomy with no graft material. Eight weeks later, after sacrificing the rats, the fusion rates of the L3–L4 lumbar segment were observed via micro CT. Images were processed in the NRecon program, ossification areas were observed by making a 3D reconstruction with the Ctvox program. In conclusion, whilst clear ossification areas could be observed in the images that were gained via micro CT in the TCP group, no ossification was observed in the control group.
between the point that the subclavian artery crosses the clavicle and the sternoclavicular joint were measured. The antero-posterior distance between the clavicle and the subclavian artery in sagittal images at the midclavicular point and diameter of the artery at the level of the first thoracic vertebra (T1) were also measured. Our results showed that the mean distance between the sternoclavicular joint and where the subclavian artery crosses the clavicle was 3.9 cm and mean diameter was 7.49 mm. At the level of T1, the anteroposterior distance varies from 0.91 to 4.3 cm. The subclavian artery travels further in men than women until it crosses the clavicle. Information gathered from this study will be useful to reduce injuries to the subclavian artery during management of clavicle fractures.

The carpal tunnel is located between the flexor retinaculum and the carpal bones and has clinical importance due to its contents. Carpal tunnel syndrome, caused by compression of the median nerve in the carpal tunnel, is the most common diagnosed clinical syndrome worldwide. Although it is studied widely, there is no consensus about contents of the carpal tunnel. Well-known anatomy textbooks also differ regarding its contents. It is common knowledge that flexor digitorum superficialis, flexor digitorum profundus and the median nerve pass through the carpal tunnel. There is, however, discussion about the presence of the tendons of flexor pollicis longus and flexor carpi radialis inside the tunnel. Some orthopaedic and anatomy textbooks accept them as part of the contents, some do not. The aim of this study was to identify the structures inside the carpal tunnel by using MRI images of the wrist. One hundred and eighteen patients (74 females, 44 males) were evaluated. Our results showed that the tendon of flexor carpi radialis was above the flexor retinaculum within its own sepal compartment while tendon of flexor pollicis longus was in the carpal tunnel in all patients.

In femoral hernias, abdominal viscera protrude into the femoral canal through the femoral ring, they have the potential to strangulate and often present as surgical emergencies. The dimensions of the femoral triangle may have a bearing on the occurrence of femoral hernias, as it can alter the size and shape of the femoral ring. The aim of this study was to assess the shape and size of the femoral triangle in male and female cadavers. Forty bilateral cadaveric dissections (20 males and 20 females) were performed, and measurements between the anterior superi- rior pubic spine, pubic symphysis, and femoral triangle apex were taken. The femoral triangles were then drawn from these measurements, and overlaid. There was little difference in shape or area between genders or sides, although the male and left sided triangles where slightly larger (88.69 vs. 81.12 cm²). One theory for the differences in femoral hernia development was the difference in femoral triangle shape and size between male and female, which may alter the size and shape of the femoral ring, however we have shown that there is no significant difference in these groups.

Primary ciliary dyskinesia (PCD) also known as Kartagener’s syndrome, is an uncommon autosomal recessive disorder that results in chronic respiratory distress, chronic otitis media and male infertility. Situs inversus is present in 50% of individuals with the condition. Initially identified as a triad of chronic sinusitis, bronchiectasis, and situs inversus by Kartagener in 1933, later findings of
uncoordinated ciliary movement in those with the disorder led to the attribution of the name of PCD. We describe the case of a 75-year-old man who underwent a Nuclear Medicine Parathyroid MIBI (Technetium sestamibi) scan due to hypercalcaemia and raised parathyroid hormone, which, as well as identifying a parathyroid adenoma, displayed an incidental finding of Kartagener’s syndrome (chronic sinusitis, bronchiectasis, and situs inversus). Although undiagnosed, the only previous imaging included chest X-rays that noted dextrocardia with no lung pathology. PCD is usually confirmed through genetic testing with the clinical signs and symptoms described above. Despite this, only 5% of patients with PCD have a well-established diagnosis. Through this case, we would like to highlight the importance of imaging findings in suggesting the diagnosis in individuals with mild symptoms who are not diagnosed in childhood.