**BACA, Winter Meeting, Burton-on-Trent, 14 December 2017**

**Human Anatomy Teaching Group, Department Physiology, Development and Neuroscience, University of Cambridge**

**Abstract 1 (Oral Presentation)**

**Anatomical variations in the juxtarenal aorta with implications for endovascular repair**

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In recent years, endovascular repair of juxtarenal abdominal aortic aneurysms is increasingly employed as a less invasive treatment option. This study aims to identify anatomical variants which may complicate or preclude endovascular repair. Dissection was performed in 35 cadavers to reveal the superior mesenteric, right and left renal arteries (SMA, RRA, LRA). The location, angle, and length of each branch was recorded. Results showed a typically short suprarenal segment (SMA to RRA 0.9±0.7 cm, SMA to LRA 1.3±0.7 cm). In around one-third of cases (12/35, 34%) this segment was ≤0.5cm, while in two cases the LRA and/or RRA arose proximal to the SMA. The renal arteries had a generally mild caudal angulation (RRA 74±17°, LRA 72±17°), but this was markedly acute (≤40°) in two cases, and cephalad in another two. Accessory renal arteries were found in 10/35 (29%). These findings suggest that difficulties with endovascular repair may result from the proximity of the LRA/RRA to SMA, making placement of fenestrated-type grafts challenging. Renal arteries with acute caudal angulation may be difficult to cannulate, while those with cephalad angulation would preclude the use of chimney-type grafts. Occlusion of accessory renal arteries may lead to segmental renal infarction.

**Abstract 2 (Oral Presentation)**

**A New Mini Anterior Hip Approach for Total Hip Replacement : a cadaveric study**

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Mini approaches for hip replacement are popular but must allow safe and adequate access. In the mini posterior approach the key is to place the incision in the line of the femoral neck which gives excellent access without the need for specialist retractors. The anterior Hueter mini approach employs a vertical incision from the anterior superior iliac spine which is extended distally, and requires a traction table and specialised retractors. We have devised an anterior approach using an incision along the line of the femoral neck anteriorly to allow adequate access without needing special retractors or a traction table. Two cadaveric dissections were performed. The 10cm incision extends from a point three fingerbreadths distal to the anterior tip of the greater trochanter towards the mid inguinal point where the femoral head lies. The fascia lata is divided in the line of the incision and retracted thus exposing the femoral neck and the reflected head of rectus femoris. This is retracted and the capsule opened, exposing the hip joint. The hip is then dislocated by breaking the ipsilateral side of the operating table to extend and externally rotate the hip affording excellent exposure.

**Abstract 3 (Oral Presentation)**

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**Investigating the ‘Box Junction’ – A novel assessment of neurovascular anatomy in the anterolateral thigh flap.**

The anterolateral thigh (ALT) perforator flap is one of the most widely used flaps in reconstructive microsurgery. There is considerable variability in the neurovascular anatomy of the flap, which has made its harvest difficult for inexperienced surgeons to master. This study investigated variation in a previously unexplored and clinically relevant aspect of perforator anatomy: the ‘box junction’ (BxJn), the point at which the perforator joins its source vessel. Negotiating the BxJn can be challenging and a time-consuming step in the operation to harvest the flap, due to the high density of small nerves and blood vessels that must be protected from damage or selectively divided. Surgeons currently have no specific information with which to anticipate presence or location of these structures. Knowledge of BxJn anatomy could allow surgeons to harvest the ALT flap more rapidly and safely, potentially making the operation more accessible. We dissected 20 cadaveric thighs and investigated the neurovascular structures present at the BxJn. We identified two consistently present vascular structures, confirmed the consistent presence of motor nerve branches and described one novel, clinically significant variation in nerve anatomy. Based on these results, we propose a simple algorithm which could aid inexperienced surgeons in negotiating the BxJn.

**Abstract 4 (Oral Presentation)**

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**Clinical significance of structural variation in the ileocaecal valve**

Closed-loop obstruction resulting from distal colonic obstruction with a competent ileocaecal valve (ICV) may lead to caecal perforation which has high morbidity. This study evaluates the relationship between morphology and competence of the ICV in a simulated closed-loop obstruction. Specimens containing the ICV with 10cm terminal ileum and 15cm ascending colon from 33 embalmed cadavers were examined. Morphologically there were 20 labial, 12 papillary and 1 tube-like ICV. ICV competence was evaluated by submerging specimens in water with the ascending colon clamped and a pressure transducer connected to LabChart. The caecum was inflated with air: if perforation occurred before valve reflux, the ICV was deemed competent (n=11). Incompetent specimens (n=22) where reflux occurred were clamped at both ends and inflated to give the perforation pressure. The presence of competent valves suggests that valve function derives partly from intrinsic structural features. More labial valves (n=14) were incompetent compared to papillary valves (n=7). Perforations mainly occurred within the ascending colon distal to the ICV (n=25), with the commonest site being along the taenia of the ascending colon (n=11). These findings show that ICV morphology may influence competence; further evidence could be derived from examining specimens removed from patients with closed-loop obstructions.

**Abstract 5 (Oral Presentation)**

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**Using the antilingula to avoid inferior alveolar nerve damage during orthognathic surgery.**

The intraoral vertical ramus osteotomy (IVRO) is an orthognathic procedure used in the correction of dentofacial abnormalities. As the mandibular ramus is approached from its lateral aspect during this procedure, the inferior alveolar nerve (IAN), which enters the mandibular foramen on the medial aspect, cannot be visualised. Therefore, identification of a landmark on the lateral ramus with a reliable relationship to the IAN would enable location of the nerve and decrease the risk of nerve injury. The antilingula, a prominence on the lateral ramus, has been posited as one such landmark.

In this study, a Revware MicroScribe G2X digitiser was used for 3D point capture on 478 dry hemimandibles in the Duckworth Laboratory, Cambridge. Nine points were mapped to determine the spatial relationship of the antilingula, mandibular foramen and lingula to other identifiable landmarks.

The antilingula was identified in all 478 specimens. The antilingula was, on average, located 1.50mm anterior and 5.73mm superior to the mandibular foramen. The antilingula was identified within a 10mm radius of the lingula on 95.4% of specimens. Based on these results, an osteotomy performed 8.6mm posterior to the antilingula during IVRO should prevent damage to the inferior alveolar nerve in 98.8% of cases.

**Abstract 6 (Poster Presentation)**

**Research in the dissection room: a valuable teaching tool**

Thompson, R., Chilvers, N., Townend, R and Brassett, C.

During the academic year 2016-17, first-year medical students in our institution engaged in data collection for anatomical research projects. This aimed to increase student engagement and promote active learning. Students contributed to clinically relevant studies by recording measurements and observations during dissection sessions. Projects included investigation of lung fissures, configurations of colonic segments, relationship of the femoral vessels, and disposition of the renal arteries. Student feedback on this course element was obtained via questionnaire at the beginning of their second year. Responses to five statements were recorded on a five-point Likert scale. The response rate was 215/269 (77%). Overall, students felt the research projects were a worthwhile part of the course (4.00±0.91). They felt the projects were particularly successful in teaching anatomical variation (4.30±0.79) and clinical relevance (4.36±0.75), and in demonstrating that anatomy is a ‘living science’ (4.24±0.89). They also felt, though less strongly, that the projects taught the scientific method (3.94±0.89) and made them more likely to engage with research in future (3.80±1.02). These findings show that student participation in research projects is a useful tool in anatomical teaching – especially aiding in recognition of anatomical variation and clinical relevance, and in the appreciation that anatomy is a ‘living science’.