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

**Abstract 1 (Poster Presentation)**

**Mapping the location, dimensions and prevalence of the thyroid isthmus: a cadaveric study with surgical implications**

*Wen PY, Lloyd T, Walker A, Pilarski A, Lunn J, Brassett C*

Human Anatomy Teaching Group, Dept. of Physiology Development and Neuroscience, University Of Cambridge, UK

Detailed understanding of thyroid morphology is critical to both emergency and elective surgical procedures of the neck and airway. In standard anatomy textbooks, the thyroid isthmus is stated to lie over the 2nd to 4th tracheal rings anteriorly. The location and morphology of the thyroid isthmus were investigated in this cadaveric study to aid planning in surgical approaches.

Anterior neck dissection was undertaken in 38 formalin-fixed cadavers to reveal the thyroid gland and associated structures. Pins were inserted into the trachea at the superior and inferior borders of the thyroid isthmus. The isthmus was subsequently divided in a longitudinal midline plane. Three measurements were taken for length (superior-inferior distance, mean calculated) and one for depth (anterior-posterior distance). Isthmus length was mapped in relation to the corresponding tracheal cartilages at the level of the pins (first tracheal cartilage = 1, second = 2 etc.; half and quarter measurements denote interval distances). Tracheal diameter was also measured. Where there was uncertainty regarding agenesis or the presence of a pyramidal lobe, the sample was sent for histology. All measurements were taken using calibrated digital vernier calipers and all donors had provided informed consent for anatomical research, in accordance with the Human Tissue Act 2004.

The 38 cadavers analysed comprised 17 males and 21 females. A pyramidal lobe was present in 8/38 (21.05%) subjects, with 2/38 (5.26%) exhibiting isthmus agenesis. Mean isthmus depth was 4.56mm, (Range 0.92-20.61, SD 3.59). There was no significant difference between male and female cadavers (p=0.1295).The median total number of tracheal cartilages covered was 2 (range 0.5-4.5, IQR 1.25). The thyroid isthmus was more superior than textbooks suggest, with 64.86% covering the first tracheal cartilage, 89.19% covering the second, 64.86% covering the third, and only 16.22% covering the fourth. Mean tracheal diameter was 20.58mm, with male tracheas being significantly wider (22.90 vs 18.79 for females, p<0.0001). There was no significant correlation between isthmus depth and tracheal diameter (p=0.3134, rho = 0.1704).

The results of our study suggest the thyroid isthmus is located more superiorly than defined textbook values, which may have important implications in planning emergency and elective surgical procedures.

**Abstract 2 (Poster Presentation)**

**Defining the connections of the left ascending lumbar vein and their significance in laparoscopic live-donor nephrectomy**

*Walker A1, Slim N1, Nicholson M2, Brassett C1*

1Human Anatomy Teaching Group, Anatomy Building, Department of Physiology, Development & Neuroscience, University of Cambridge

2University of Cambridge Department of Surgery, Addenbrooke’s Hospital, UK

The advent of laparoscopic live-donor nephrectomy for renal transplantation in recent years has prompted the need to define the precise anatomical relations of the left renal vein (LRV) and its tributaries. The left kidney is preferred as the greater length of the LRV facilitates implantation in the recipient. While previous studies have described variations in the LRV system, the connections between the left ascending lumbar vein (LALV) and LRV tributaries have been less welldefined. This study aims to further characterise the LALV and proposes a novel classification for its relation to other veins. Dissection of the LRV system, including the left suprarenal vein (LSV), left gonadal vein (LGV) and LALV, was performed in 38 cadavers. Their drainage points into the LRV were recorded, and measurements taken of the distances from these points to the junction of the LRV and inferior vena cava (IVC). In 35 (95%) cases, the LRV was anterior to the aorta, entirely posterior in 1 case, and circumaortic in 2 cases. Duplication of the LSV and LGV occurred in 6 (16%) and 10 (27%) cases respectively. A direct posterior connection between the LALV and LRV was identified in 32 (86%) cases. The drainage point of the LALV into the LRV lay between the IVC and LGV in 8 (25%) cases. In 20 (63%) cases, the drainage points of the LALV and LGV were equidistant from the IVC; and in 5 (16%) cases, those of the LALV and posterior branch of the LRV were equidistant from the IVC. In these two groups, the vessels shared a confluent trunk in 10 and 4 cases respectively. In 3 cases, connections were observed between all three vessels (LALV, LGV and posterior branch of LRV). No confluence trunk was shared by the LALV and LSV. These results confirm the high incidence of communicating LALVs, which represent a troublesome source of operative bleeding if unrecognised. Confluent venous trunks may also present difficulties during vessel ligation prior to nephrectomy. It is suggested that a novel classification of the relation of the LALV based on these findings may assist in surgical planning and reduce complications.