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CASE REPORT

Anterior Course of Left External Jugular Vein

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Abstract

Background: Variations in the drainage of the external jugular vein (EJV) are uncommon. We report a rare case of unilateral left EJV drainage that coursed superficial to the left clavicle and then proceeded to drain into the left subclavian vein.

Case Information: During routine dissection of a 70-year-old African-American male cadaver, a unilateral variation in the left external jugular vein was noted. The typical left EJV path courses posterior and deep to the clavicle before draining into the left subclavian vein. This variant EJV was found to descend superficial to the middle third of the left clavicle and then proceeded to drain into the left subclavian vein.

Conclusions: Anatomical variations of the EJV may pose certain health risks and increase the complexity of various surgical procedures. The EJV is commonly used as an indicator for increased central venous pressure which can be used concordantly with other symptoms during cardiac workup. Knowledge of the EJV and its common variants is important for clinicians and surgical specialists alike. Surgeons performing placement of pacemaker leads or implantable cardioverter defibrillators should be acutely aware of the EJV and its variants to reduce complications and improve patient outcomes. Patients and individuals possessing this EJV variation may be at increased risk of adverse outcomes in the event they were to fracture their clavicle. The clavicle is the most commonly fractured bone in the body and the middle third is the most fractured segment, where this variant was noted. Notching of the clavicle was noted where the EJV passed superficial to it. We postulate this may be due to increased pressure from its tortuous path, as well as aberrant development due to the mobility of the clavicle.

Keywords: External Jugular Vein, Anatomic Variation, Venous, Clavicle, Fracture, Subclavian Vein,

Case Information

During routine dissection of a 74-year-old African-American male cadaver, a unilateral variation in the left external jugular vein (EJV) was noted. The dissection was performed at the University Of North Texas Health Science Center in the Center for Anatomical Sciences. This variant EJV was found to descend anterior and superficial to the left clavicle and then proceeded to drain into the left subclavian vein. This is a deviation from the typical left EJV path which normally courses posterior and deep to the clavicle before draining into the left subclavian vein. After photographing the variant, a deeper dissection and removal of the left clavicle was performed. Following clavicular removal, it was noted that the EJV formed a notch within the left clavicle where it had passed superficial to the clavicle (Figure1, 2 & 3).

Case Discussion

While variant drainage of the venous system is common, variations of the drainage of the EJV are uncommon and, as such, there are limited case reports noting this abnormality. The external jugular vein is formed by the union of posterior division of retromandibular vein and posterior auricular vein. Previous literature research uncovered an article by Anastasopoulos. which reported a similar variant finding of three superficial veins coursing superficial to the clavicle including the left and right EJV and the left posterior EJV [1].

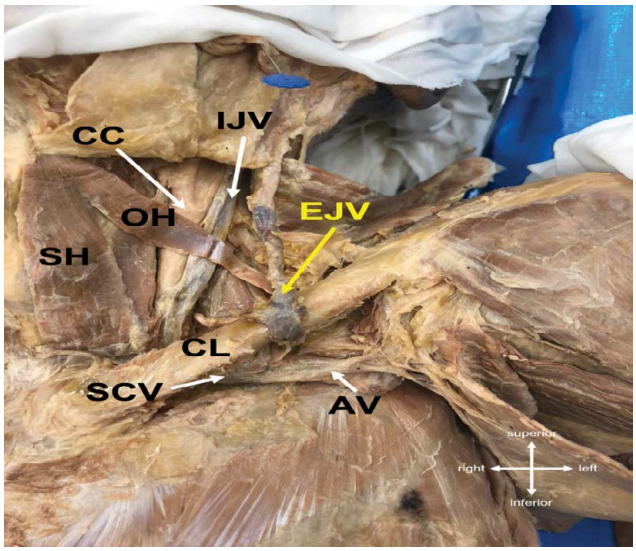

Figure 1: Anterior view of left neck, chest, and shoulder.
CC: Common carotid, IJV: Internal jugular vein, OH: Omohyoid, SH: Sternohyoid,
EJV: External jugular vein, CL: Clavicle, SCV: Subclavian vein, AV: Axillary vein

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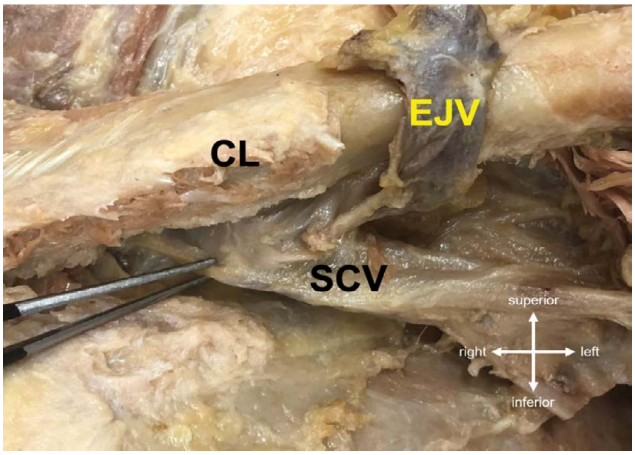

Figure 2: Close up view of the left external jugular vein coursing anterior to the left clavicle with drainage to the left subclavian vein. Left clavicular notching is clearly visible medial to the left external jugular vein.
EJV: External jugular vein, CL: Clavicle, SCV: Subclavian vein

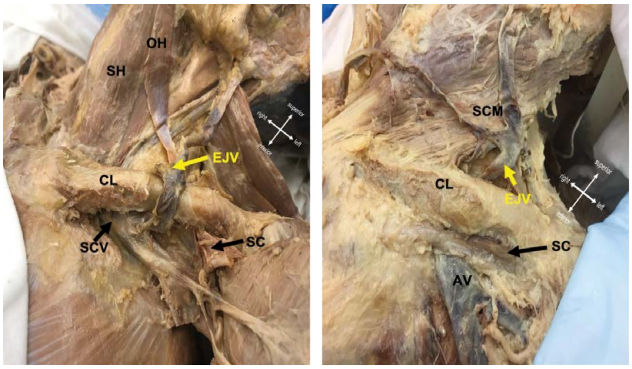

Figure 3: Comparison image of the variant external jugular vein course (left image) and the ascribed normal course from a different cadaver (right image).
Left Image- OH: Omohyoid, SH: Sternohyoid, EJV: External jugular vein, CL: Clavicle, SC: Subclavius (reflected), SCV: Subclavian vein
Right Image- SCM: Sternocleidomastoid, CL: Clavicle, EJV: External jugular vein, SC: Subclavius, AV: Axillary vein

The anatomical variation of the EJV may pose certain health risks and may increase the complexity of various surgical procedures. The EJV is commonly used as an indicator for increased central venous pressure, which can be used concordantly with other symptoms for the diagnosis of: right-sided heart failure, pulmonary hypertension, tricuspid valve stenosis, or constrictive pericarditis [2]. Knowledge of the EJV and its common variants is important for clinicians and surgical specialists. Surgeons performing placement of pacemaker leads or implantable cardioverter defibrillators should be acutely aware of the EJV and its variants to reduce complications and improve patient outcomes [3]. This is due, in part, to physician preference in using the external jugular vein because of reduced risk compared to the internal jugular vein [3].

This cadaver was an African-American male and, as such, the variant was not noted on pre-dissection integumentary exam. We are unaware whether or not the individual had knowledge of his variant, but we hypothesize that in light-skinned individuals the increased skin lucency may allow individuals and researchers to discover this variant pre-mortem, which could reduce complications in those patients. Patients and individuals possessing this EJV variation may be at increased risk of adverse outcomes in the event they were to fracture their clavicle. The clavicle is the most commonly fractured bone in the body and represents 2.6% of all fractures and 44% of those in the shoulder girdle [4]. O'Neill et al notes that 79.3% of clavicle fractures occur in the middle third, 19.3% occur in the lateral third and 1.4% occur in the medial third [5]. This cadaver was noted to have his EJV passing superficial to the middle third of his clavicle, therefore further increasing his probability of having an adverse outcome from fracture. Individuals with knowledge of their variation should be cautious when approaching activities that may increase the risk of fracture.

Inferior rib notching is commonly noted to occur in cases of coarctation of the aorta due to increased arterial pressure in the intercostal arteries. Applying this physiologic principle, we postulate the clavicular notching may be due to increased jugular venous pressure due to the severe angulation of its course into the left subclavian vein. However, it is possible the notching may be due to aberrant clavicular development during life.

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