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A Rare Accessory Clavicular Muscle With Clavicular Origin and Insertion in the Right Posterior Cervical Triangle: A Cadaveric Case Report

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Abstract

Variations in cervical and supraclavicular musculature have been documented, including the cleido-occipital, levator claviculae, levator scapulae, sternocleidomastoid (SCM), and trapezius muscles. In this report, we describe a rare accessory clavicular muscle with both right clavicular origin and insertion, identified during dissection of an approximately 35-year-old male cadaver. The muscle was located in the right posterior cervical triangle, originating from the superior surface of the clavicle immediately medial to the trapezius insertion and inserting on its superoposterior surface, posterior to the lateral margin of the clavicular head of the sternocleidomastoid. The muscle had close anatomical relationships with the anterior and posterior branches of the supraclavicular nerve and the external jugular vein (EJV). This rare anatomical variant has potential clinical relevance and may influence local neurovascular relationships. Recognition of such variants may improve anatomical interpretation and reduce diagnostic errors.

Categories: General Surgery, Preventive Medicine, Anatomy
Keywords: cadaveric dissection, clavicular origin, muscle variants, posterior cervicle triangle, uganda

Introduction

Numerous muscular variations involving the posterior cervical triangle and infrahyoid region have been documented in the literature. These include variations of the sternocleidomastoid (SCM) muscle [1-3], trapezius muscle [3-5], levator scapulae muscle [6], and levator claviculae muscle [7, 8]. Other reported variations include the aberrant cleido-occipital muscle [9] and anatomical variations involving the inferior belly of the omohyoid muscle [10]. Of particular relevance to the present case, the levator claviculae typically originates from the transverse processes of the upper cervical vertebrae and inserts onto the clavicle [11,12]. Similarly, previously described cleido-occipitalis variants are characterized by muscular connections between the clavicle and the occipital or trapezius regions. For example, Kwak et al. [13] described a distinct bundle of the upper trapezius muscle that attached to the clavicle through a separate tendon, whereas Paraskevas et al. [9] reported an accessory cleido-occipital muscle originating from the trapezius and inserting onto the medial third of the clavicle.

Accessory clavicular heads of the SCM and variations of the omohyoid muscle also exhibit distinct anatomical configurations, generally involving continuity with the parent muscle or attachments extending towards the mastoid process, occipital region, or hyoid bone, respectively. These previously described variations differ from the configuration observed in the present case, where the accessory muscle had two distinct attachments on the same clavicle. To our knowledge, this specific muscular configuration has not been previously reported in the anatomical literature. Nevertheless, its classification and novelty should be interpreted in the context of existing anatomical descriptions, while acknowledging the possibility that similar variants may have been previously unrecognized or described using different terminology.

Muscular variations within the posterior cervical triangle may have important clinical implications due to their potential to alter or compress adjacent neurovascular structures. In particular, compression or entrapment of the supraclavicular nerves may result in supraclavicular nerve entrapment syndrome, which can present with abnormal sensory sensations on the ipsilateral side. Although muscular variations are often asymptomatic and discovered incidentally during surgical procedures, radiological examinations or cadaveric dissections [14], their anatomical relationships with neighboring structures may have clinical significance. It has been estimated that an individual may possess approximately 10 muscular variations throughout the body [15].

The precise etiology of muscular variations remains incompletely understood. However, genetic and developmental mechanisms, along with potential environmental influences, have been proposed as contributing factors [16]. Therefore, recognizing and documenting these variations is important for

expanding anatomical knowledge and minimizing the risk of iatrogenic injury during surgical and invasive procedures.

Reporting this variation is particularly relevant because an unexpected muscular structure within the posterior triangle may influence the identification and interpretation of adjacent neurovascular structures during surgical exploration, regional procedures, and radiological assessment. Accordingly, this case report aimed to describe the morphological characteristics, attachment sites, and topographical relationships of an unusual accessory clavicle-to-clavicle muscle identified in the right posterior triangle of the neck during routine cadaveric dissection, and to compare its anatomical features with previously reported cervical muscular variations.

Case Presentation

During routine anatomical dissection of the cervical region, an unusual accessory muscle with both its origin and insertion on the clavicle was identified within the posterior cervical triangle. The variation was observed in a formalin-fixed adult male cadaver, estimated to be approximately 35 years old. According to the available donor or cadaver records, the individual had died following a traumatic head injury. The posterior cervical region was systematically dissected using standard layer-by-layer anatomical dissection techniques, in accordance with the guidelines outlined in Cunningham's Manual of Practical Anatomy, Volume 3 [17].

The muscle was located within the posterior cervical triangle and consisted of a single belly of skeletal muscle, approximately 0.5 cm in breadth, with a very slender tendon measuring less than 0.5 cm in width. Its total length was approximately 8 cm, with the muscular portion accounting for two-thirds of its length and the tendinous portion for the remaining one-third. It originated from the superior surface of the clavicle, immediately medial to the insertion of the trapezius muscle, within the lateral concavity of the clavicle. Its long, slender tendon inserted onto the superoposterior surface of the same clavicle, immediately posterior to the lateral margin of the clavicular head of the sternocleidomastoid muscle. At its insertion, the tendon fanned out and blended with the periosteum of the clavicle. Figure *1* below illustrates the origin and insertion of the rare muscle on the clavicle.

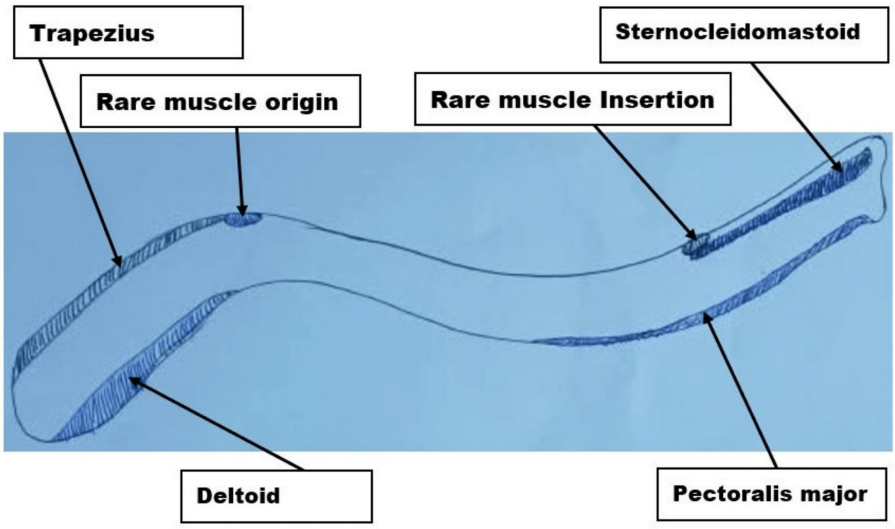


FIGURE 1: Schematic diagram showing the origin and insertion of the rare muscle on the right clavicle

Image created by Dr. Caleb Tuhumwire (author)

Course and relations

The muscle initially followed an upward, and later downward course like a projectile being acted on by gravitational pull. The highest point of its course was 3 cm cephalad to the clavicle. The muscle belly was within the investing layer of deep cervical fascia. It was crossed on its external aspect by the external jugular vein in the region where it tapered to become tendinous. The tendon was insinuated in a layer between the investing fascia (lateral to the clavicular head of the sternocleidomastoid) and the middle cervical fascia that envelopes the inferior belly of the omohyoid muscle. Traction on the muscle tendon stretched both the sternocleidomastoid investing fascia and the fascia of the inferior belly of the omohyoid.

On the deep surface of the muscle, as it tapered to become tendinous, it was crossed by the anterior and

posterior branches of the intermediate supraclavicular nerve about 1 cm inferior to the point of bifurcation. The anterior branch of the supraclavicular nerve, having passed under the tapering portion of the muscle, divided into two branches which turned medially and coursed nearly transversely but superficially to the tendon of the muscle. The external jugular vein, having crossed over the muscle belly near its midpoint, pierced through the investing fascia and middle fascia and joined the transverse cervical vein, accompanied by the transverse cervical artery in a slightly deeper plane.

Blood supply and innervation

The neurovascular relationships of the muscle were not clearly appreciated. However, its proximity to the external jugular vein and transverse cervical neurovascular pedicle may suggest a vascular supply and venous drainage associated with the transverse cervical vessels. Similarly, its close relationship with the anterior branch of the intermediate supraclavicular nerve may suggest a possible innervation by this nerve, despite its predominantly cutaneous sensory function. Figures *2*-*3* illustrate the anatomical relationships of this rare muscle with the surrounding structures.

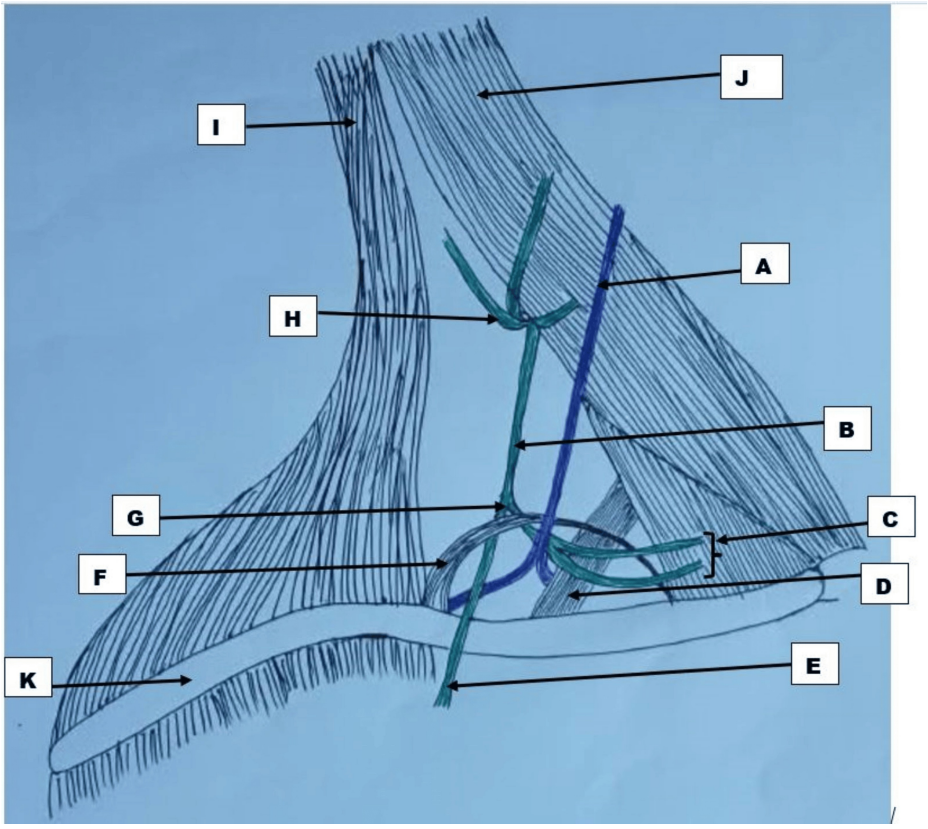


FIGURE 2: Schematic representation of the rare muscle in relation to other surrounding structures

A: External jugular vein. B: Supraclavicular nerve (main trunk). C: Branches of the anterior division of the supraclavicular nerve. D: Inferior belly of the omohyoid muscle. E: Posterior division of the supraclavicular nerve. F: The rare muscle. G: Bifurcation of the supraclavicular nerve. H: Erb's point. I: Trapezius muscle. J: Sternocleidomastoid muscle. K: Clavicle

Image created by Dr. Caleb Tuhumwire (author)

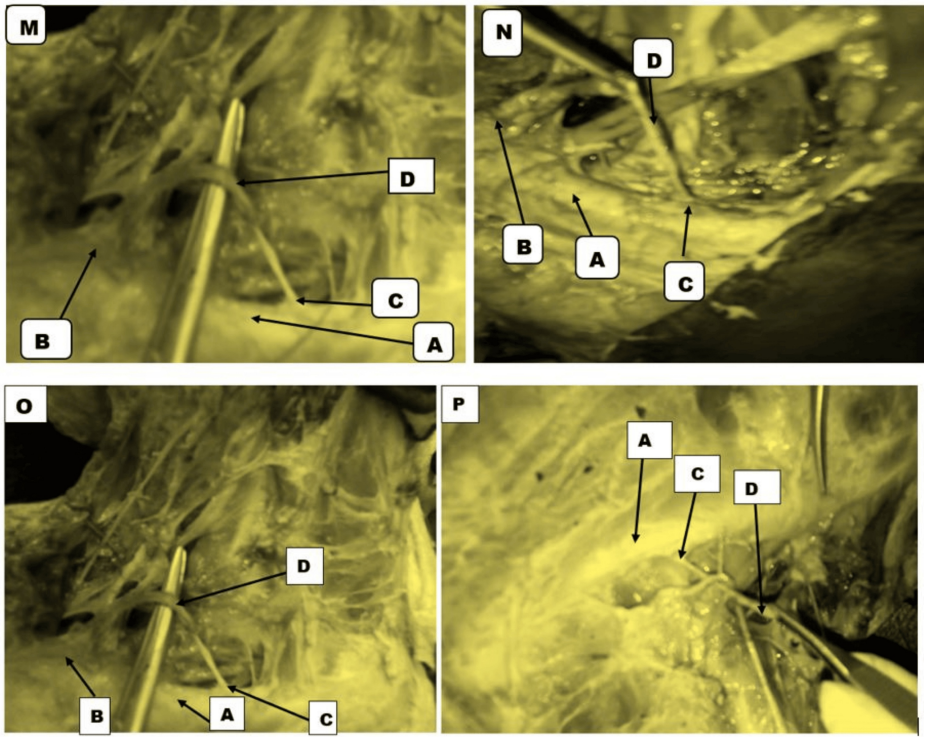


FIGURE 3: An anatomical image of the rare muscle in relation to other surrounding structures

M: Inferior cervical view. N: Superior cervical view. O: Lateral inferior view. P: Lateral-superior cervical view. A: Clavicle bone. B: Clavicular origin. C: Clavicular insertion. D: The rare muscle

Discussion

The accessory muscle identified in this case had an unusual clavicle-to-clavicle attachment within the posterior cervical triangle. It comprised a single muscular belly that originated from the superior surface of the lateral clavicle and continued as a slender tendon inserting onto the superoposterior surface of the same bone. This configuration differs from the levator claviculae, which typically extends from the upper cervical transverse processes to the clavicle [11]. It also differs from reported cleido-occipital variants, which generally involve muscular connections between the clavicle, trapezius, and occipital region [9,13].

Unlike accessory clavicular heads of the SCM, the muscle in this case was a separate structure rather than an additional component of the SCM. Its clavicle-to-clavicle attachment pattern also distinguishes it from omohyoid variants, which typically retain an attachment towards the hyoid bone despite variations in morphology [18]. The combination of an independent muscular belly, a long slender tendon, and two distinct attachment sites on the same clavicle is the principal distinguishing feature of this variation. To our knowledge, this specific configuration has not been previously described in the anatomical literature, although further comparative investigation is warranted to substantiate its novelty.

In addition, the anatomical findings in the present case demonstrate a close and potentially clinically significant relationship between the anomalous muscle and the supraclavicular nerves. The anterior and posterior branches of the intermediate supraclavicular nerve passed along the deep surface of the anomalous muscle. Notably, branches arising from the anterior division passed beneath the tapering muscular portion before turning to course superficially to the tendon (Figures *2*-*3*). This unusual configuration may predispose the nerve branches to mechanical irritation or compression, particularly during contraction of the anomalous muscle.

Repetitive compression or traction of the nerve branches could potentially result in altered sensory perception, including paraesthesia or supraclavicular neuralgia [7,8]. In addition, traction on the tendon of the anomalous muscle produced tension within the investing fascia of the sternocleidomastoid muscle and the fascia associated with the inferior belly of the omohyoid muscle. This observation suggests that the anomalous muscle may participate in a broader network of fascial relationships within the posterior cervical triangle. Changes in muscle tension or contraction may therefore be transmitted to adjacent fascial planes and neurovascular structures.

In addition to its relationship with the supraclavicular nerves, the anomalous muscle was closely related to the external jugular vein (EJV). The EJV crossed the muscle belly near its midpoint before piercing the investing fascia and then joining the transverse cervical vein. This vascular relationship is of potential clinical importance, because contraction or shortening of the anomalous muscle could alter local fascial tension and potentially exert positional compression on the EJV. Although the functional significance of this relationship cannot be established from a single cadaveric observation, such compression could theoretically influence superficial venous drainage in the supraclavicular region.

Awareness of posterior cervical anatomical variations is important for safe surgery, as deviations from expected landmarks may increase the risk of injury and complications [19]. The accessory muscle described in this case may also mimic a pathological mass on imaging, resulting in misdiagnosis, unnecessary investigations, or delayed diagnosis [11,19]. Recognising such variants is therefore essential for accurate imaging interpretation, surgical planning, and appropriate patient management.

Limitations of the study

This case report has several limitations, including its reliance on a single cadaveric specimen and the absence of histological and functional analyses. Consequently, it remains uncertain whether the observed supraclavicular muscle represents a distinct anatomical entity or an atypical extension or variation of one of the adjacent muscles.

Conclusions

The observed relationships between the anomalous muscle, supraclavicular nerve branches, EJV, and surrounding fascial structures highlight the potential clinical relevance of this previously undescribed muscular variation, particularly during surgical procedures, regional anaesthesia, and interventions involving the posterior cervical and supraclavicular regions.

Additional Information

Author Contributions

All authors have reviewed the final version to be published and agreed to be accountable for all aspects of the work.

Acquisition, analysis, or interpretation of data: Gladys Nakidde, Caleb Tuhumwire, Ronald Kamoga

Drafting of the manuscript: Gladys Nakidde, Caleb Tuhumwire, Ronald Kamoga

Critical review of the manuscript for important intellectual content: Gladys Nakidde, Caleb Tuhumwire, Ronald Kamoga

Concept and design: Caleb Tuhumwire, Ronald Kamoga

Disclosures

Human subjects: Informed consent for treatment and open access publication was obtained or waived by all participants in this study. **Conflicts of interest:** In compliance with the ICMJE uniform disclosure form, all authors declare the following: **Payment/services info:** All authors have declared that no financial support was received from any organization for the submitted work. **Financial relationships:** All authors have declared that they have no financial relationships at present or within the previous three years with any organizations that might have an interest in the submitted work. **Other relationships:** All authors have declared that there are no other relationships or activities that could appear to have influenced the submitted work.

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