

Cervicalgia and anomalous insertion of the levator scapulae muscle. Case report

Cervicalgia e inserción anómala del músculo elevador de la escápula. Reporte de caso

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Abstract

Anatomical variants in the cervical spine musculature and shoulder girdle are relatively uncommon and have the potential to cause functional and postural abnormalities, which in turn could cause chronic pain and a sensation of mass. The case of a 66-year-old woman is presented, in whom a computed tomography scan shows the anomalous insertion of an accessory belly of the levator scapulae muscle, which is inserted into the serratus anterior muscle fascia and second rib, causing cervicalgia and palpable asymmetry in the soft tissues of the neck. It is important to report these anatomical variants to explain certain physical disorders and clinical symptoms of the cervico-scapular region, guiding the treatment, the vast majority of which have kinesiological management.

Keywords: Levator scapulae muscle. Anatomical variant. Cervicalgia. Computed tomography.

Resumen

Las variantes anatómicas en la musculatura de la columna vertebral cervical y cintura escapular son relativamente infrecuentes y tienen el potencial de causar anomalías funcionales y posturales, que a su vez podrían provocar dolor crónico y sensación de masa. Se presenta el caso de una mujer de 66 años, en la que por medio de tomografía computarizada se evidencia la inserción anómala de un vientre accesorio del músculo elevador de la escápula, que se inserta en la fascia del músculo serrato anterior y segunda costilla, determinando cervicalgia y asimetría palpable en las partes blandas del cuello. Es importante reportar estas variantes anatómicas con el fin de explicar ciertos trastornos físicos y cuadros clínicos de la región cervico-escapular, orientando el tratamiento, que en su gran mayoría tienen manejo kinesiológico.

Palabras clave: Músculo elevador de la escápula. Variante anatómica. Cervicalgia. Tomografía computarizada.

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Introduction

The levator scapulae muscle is a flat muscle made up of fascicles that originate from the transverse processes of the atlas and axis, in addition to the posterior tubercles of the transverse processes of C3 and C4 to form a common tendon that inserts into the superior angle and medial border of the scapula, it is innervated by the dorsal scapular nerve and its main function is to elevate and rotate the scapula. However, there are different anatomical variations of this, among which are its different vertebral origins, its degree of separation into fascicles, and the existence of accessory origins¹. The variations are related to a mastoid origin, as well as the insertion in the fascia of the rhomboid muscles, serratus anterior, trapezius, and other less frequent ones such as insertion in the clavicle, first and second ribs, and spinous processes of thoracic vertebrae^{2,3}.

Anatomical variants of the neck muscles are clinically relevant and can be confused with lymphadenopathy or thrombosed veins⁴. In particular, the atypical insertion or accessory fasciculus of this muscle may be implicated as a cause of discomfort in patients with chronic neck pain, tension-type shoulder pain, and headache, speculating a relationship between the anatomical variants of the muscle and the increased risk to develop pain⁵. Our objective is to report the case of an accessory fascicle of the levator scapulae muscle diagnosed in our institution and to carry out a brief review of the topic.

Case report

A 66-year-old woman, with no relevant pathological history, with a history of mild neck pain with multiple consultations, in which symptomatic management has been carried out, with partial improvement of the pain, confirming in the last control an increase in volume in the left lateral region of the neck. Initially, a cervical ultrasound was requested, which did not report significant alterations. Given the persistence of symptoms, a soft-tissue computed tomography (CT) of the neck with intravenous contrast was requested, which demonstrated a group of thickened left accessory muscle fibers originating from the paravertebral muscle fascia adjacent to the transverse processes of C2 and C3, with a lateral and inferior orientation and inserted distally into the fascia of the ipsilateral serratus anterior muscle, compatible with an anomalous insertion and accessory fasciculus of the levator scapulae muscle (Figs. 1 and 2). The rest of the study did not demonstrate relevant findings.

Discussion

Anatomical variants of the levator scapulae muscle can appear regularly during routine dissections and have numerous variants of origin and insertion; however, reports in the literature are scarce. In anatomical studies using magnetic resonance imaging (MRI), the insertion in the serratus anterior, serratus posteroinferior, and first rib has been described as the most frequent and can be unilateral or bilateral^{1,2}.

Diagnostic imaging plays a crucial role in detecting unusual insertion of the levator scapulae muscle. Ultrasound, CT, and MRI can be used to confirm the presence of the muscle variant and its insertion site. Ultrasound can show the muscle fibers and their insertion point, however, it must be performed with a high level of suspicion, since these findings are usually difficult to demonstrate by this method, as occurred in our case. CT and MRI can provide more detailed information about the muscle and its relationship to adjacent structures. They can also identify any associated bone abnormalities, such as a cervical rib or scoliosis, which may contribute to clinical manifestations¹.

Due to its location, this muscle has been considered important in head and neck reconstructive surgeries and is involved in the causes of discomfort in patients with chronic neck and shoulder pain, such as the case we present, the delay in the diagnosis being characteristic due to its low frequency. In our patient, neck CT demonstrated an asymmetry in the soft tissues, due to the presence of an anomalous insertion through an accessory bundle of the levator scapulae muscle^{1,2}. Furthermore, these variants may be associated with syndromic conditions, such as levator scapulae syndrome, crepitant scapula, or cervicodorsal myofascial syndrome, which are characterized by neck pain, pain in the medial aspect of the scapula and sometimes bursitis with crepitations. Considering the delicate mechanical balance required to maintain proper posture and spinal alignment, a muscle variation could lead to structural changes which in turn can lead to soft-tissue skeletal pain. This may explain trigger points and crepitation described in the literature^{6,7}.

Treatment of atypical levator scapulae insertion depends on the severity of the symptoms. Conservative measures such as physical therapy, massage, acupuncture, and pain relievers are usually the first-line treatment for mild-to-moderate cases. In severe cases, associated with syndromes such as crepitant scapula, surgical intervention may be necessary to relieve symptoms^{8,9}.

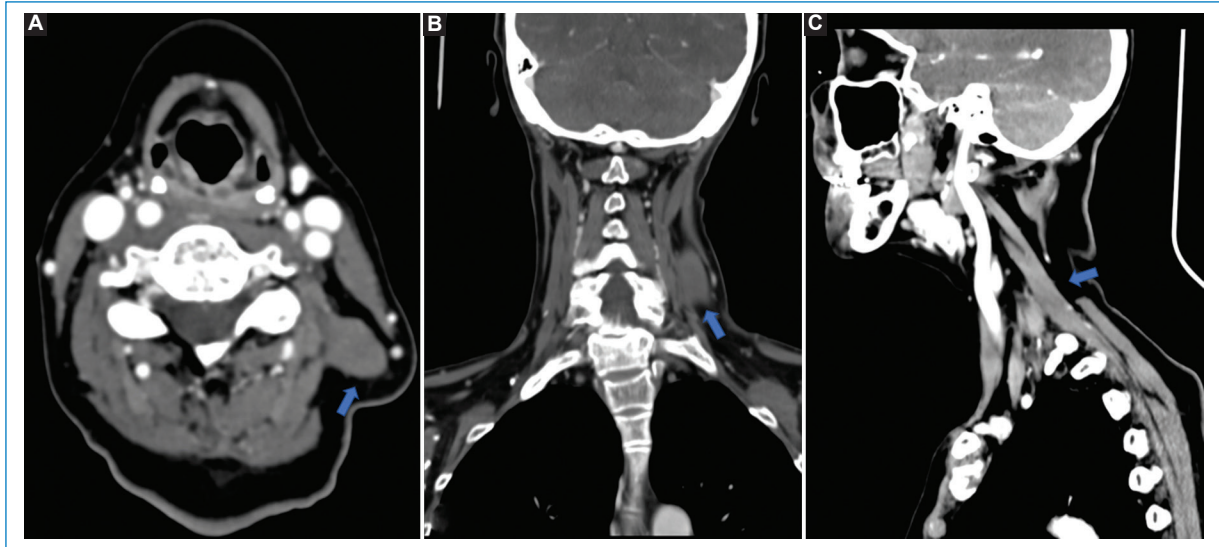


Figure 1. Selected computed tomography slices of the neck with contrast on the axial **A:** coronal **B:** and sagittal **C:** axes, where the asymmetry between the levator scapulae muscles is demonstrated, with the left one having the greatest volume and rounded morphology, generating a sensitive palpable mass in the patient.

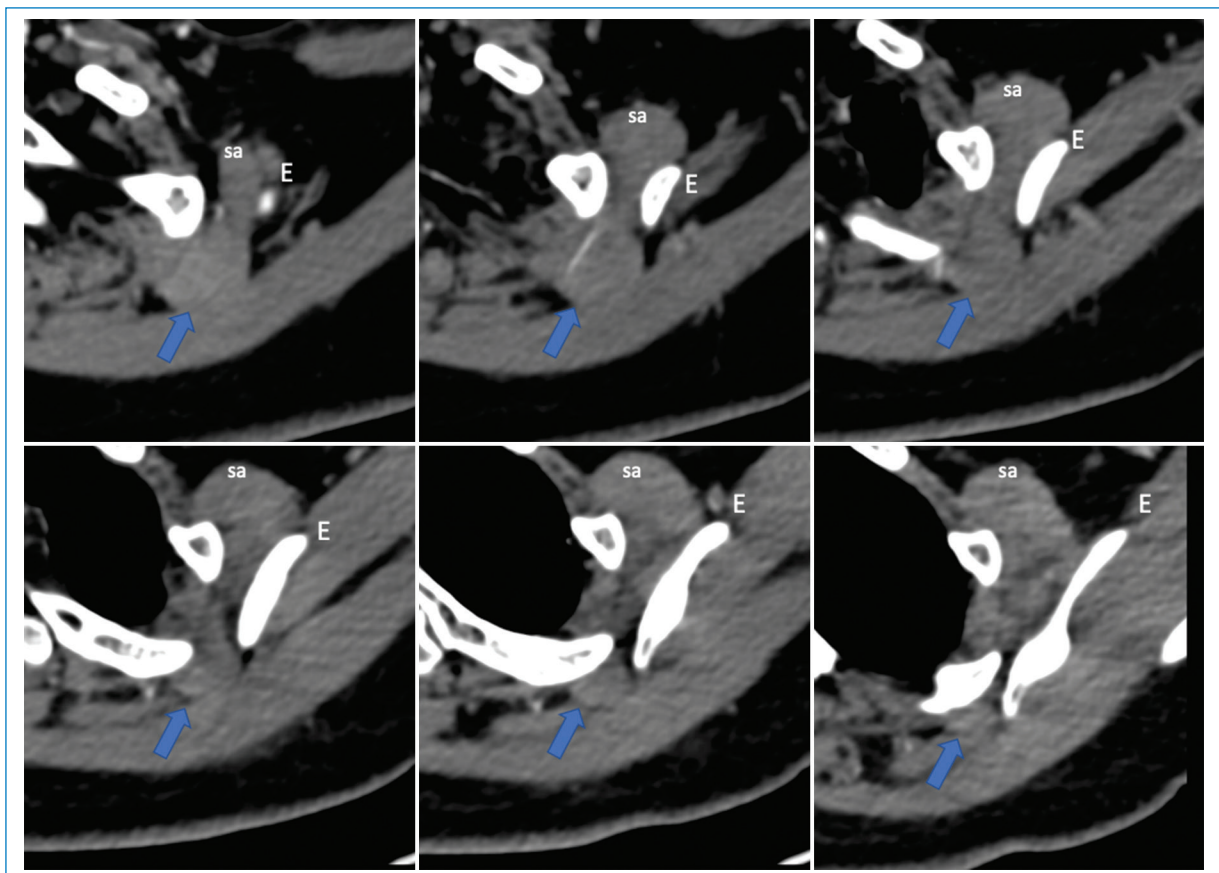


Figure 2. Selected computed tomography axial slices of the neck showing the anomalous insertion of one of the levator scapulae muscle bellies (blue arrow) in the aponeurosis of the serratus anterior (sa) muscle and second rib. Note the plane of adipose cleavage between the levator scapulae muscle and the medial edge of the scapula (E), its usual insertion.

Conclusion

The anomalous insertion and accessory fascicles of the levator scapulae muscle are rare anatomical variants that can present with various clinical manifestations, such as neck pain, shoulder pain, and scapular crepitation, among others. Diagnostic imaging plays a crucial role, and conservative measures are usually the first-line treatment. Surgical intervention may be necessary in severe cases. This variant should be included in the differential diagnosis of neck pain to avoid erroneous diagnoses and offer adequate treatment.

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Conflicts of interest

The authors declare that they have no conflicts of interest.

Ethical disclosures

Protection of people and animals. The authors declare that no experiments have been carried out on humans or animals for this research.

Data confidentiality. The authors declare that no patient data appear in this article.

Right to privacy and informed consent. The authors have obtained informed consent from the patients and/or subjects referred to in the article. This document is in the possession of the corresponding author.

Use of artificial intelligence to generate texts. The authors declare that they have used generative artificial intelligence, specifically the help of the ChatGPT tool, solely for the writing of this paper.

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