

## CASE REPORT

# Unilateral Accessory Slip of the Splenius Capitis Muscle: A Case Report

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## Abstract

**Introduction:** Anatomical variations in the muscles of the posterior neck are relatively uncommon, especially involving the serratus posterior superior muscle.

**Case description:** This case report describes an unusual unilateral variant of the serratus posterior superior muscle found during routine dissection of a formalin-fixed male cadaver. On the right side of the neck, an accessory muscle slip was discovered, originating from the mastoid process of the temporal bone close to the typical attachment site of the splenius capitis muscle. This abnormal muscle travelled superficially over the native splenius capitis and splenius cervicis muscles, then continued deep

to the rhomboid minor, and inserted into the fascia on the serratus posterior superior muscle near the medial attachment of the serratus posterior superior muscle. No similar variation was seen on the opposite side, making this a unilateral finding.

**Conclusion:** This variant was named the “Accessory serratus posterior superior muscle” based on its origin and insertion pattern. Recognizing such muscular variations is clinically important because they may mimic soft tissue masses in imaging studies or contribute to myofascial pain syndromes. Awareness of these anomalies is essential for clinicians, radiologists, and surgeons involved in head and neck diagnostics and interventions, as it helps prevent misdiagnosis and guides appropriate treatment planning.

**Key Words:** *Serratus posterior superior; Muscle variation; Neck anatomy; Accessory muscle*

## Introduction

The serratus posterior superior muscle appears as a slender quadrilateral sheet in the upper thoracic region, positioned beneath the rhomboid major and minor and above the erector spinae. Its origin is traced to a delicate aponeurotic layer arising from the lower part of the nuchal ligament, the spinous processes

of C7 to T3, and the supraspinous ligaments. The fibers extend in an inferolateral direction, anchoring onto the superior borders and outer surfaces of the 2<sup>nd</sup> to 5<sup>th</sup> ribs, just lateral to the rib angles. It is innervated by the anterior rami (intercostal nerves) of the 2<sup>nd</sup> to 5<sup>th</sup> thoracic spinal nerves (T2–T5).

Functionally, the muscle plays a minor role

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in aiding inspiration by slightly lifting the upper ribs; however, contemporary anatomical studies suggest it may serve more significantly in proprioception than in active respiration. Clinically, this muscle may be implicated in myofascial pain syndromes, particularly in the upper thoracic region. During cadaveric dissection, it is exposed by reflecting the overlying trapezius and rhomboid muscles, and care must be taken not to damage its delicate structure [1, 2].

The aim of this study was to document a rare unilateral accessory slip of the splenius capitis muscle, originating from the mastoid process and inserting into the fascia over the serratus posterior superior. Observed during routine cadaveric dissection, this splenius capitis accessorius variation, coursing superficial to native splenius muscles and deep to the rhomboid minor, holds clinical importance in surgical anatomy and radiological interpretation due to its potential to mimic pathological structures and contribute to myofascial pain.

## Case Report

### Specimen information

At the Department of Sharir Rachana, National Institute of Ayurveda, Jaipur, a routine educational dissection was conducted on a male cadaver of North Indian origin that had been formalin-fixed. The right side of the upper thoracic and posterior cervical regions showed the abnormality.

### Anatomical findings

During routine dissection of the neck and back regions, we found a unilateral extra slip of the splenius capitis muscle on the right side in a human cadaver. This muscle originated from the mastoid process and extends inferiorly to insert on the serratus posterior superior muscle (Figure 1).



**Figure 1)** Image showing the origin (→) and insertion (→) point of the splenius capitis accessorius muscle (b/w white dotted lines).

The right serratus posterior superior muscle presented with its normal attachments, proximally from the spinous processes of C7-T2 vertebrae, and distally to the superior borders of the 2<sup>nd</sup>–5<sup>th</sup> ribs. The tendinous fibre of the extra slip of the splenius capitis muscle was inserted superficially on the serratus posterior superior muscle 3 cm lateral to the midline. Fibres of both muscles fused and attached to the spinous process of the C7 vertebrae (Figure 2).



**Figure 2)** White dotted lines highlight the fusion of the extra muscle slip 3 cm laterally with the serratus posterior superior muscle.

The dimensions of the extra slip were measured consistently in width throughout its muscle belly, with a length of 14 cm and a width of 1 cm. This extra slip of the muscle travelled superficially over the native splenius capitis and splenius cervicis muscles, then continued deep to the rhomboid minor and inserted into the fascia on the serratus posterior superior muscle near the medial attachment of the serratus posterior superior muscle (Figures 3 and 4).

### Timeline of Dissection and Observation

- Academic year- 2025, M.D. Batch 2022
- Date of Dissection [Neck region]: July 2025
- Morphometric Analysis and Documentation: July 2025
- Photographic Documentation and Review of Literature: July 2025

### Method of Dissection and Documentation

In accordance with accepted anatomical procedures, the upper thoracic and posterior cervical regions were dissected. Deeper muscle structures were revealed by reflecting the rhomboid and trapezius muscles. A hitherto unseen muscular slip was discovered during dissection on the right side, deep to the rhomboid minor and superficial to the splenius muscles. The accessory muscle was measured at 14 cm in length and 1 cm in width.

### Detailed Morphological Description

#### Origin

Mastoid process of the temporal bone (near the splenius capitis origin).

#### Course

The splenius capitis accessorius muscle travelled superficially over the splenius capitis



**Figure 3)** Images highlight that this splenius capitis accessories muscle (white star) travelled superficially over the splenius capitis (\*) and splenius cervicis muscles (\*), then continued deep to the rhomboid minor (\*), and inserted into the fascia on the serratus posterior superior muscle (\*) near the medial attachment of the serratus posterior superior muscle.



**Figure 4)** Images highlight that this splenius capitis accessories muscle (white star) travelled superficially over the splenius capitis (\*) and splenius cervicis muscles (\*), then continued deep to the rhomboid minor (\*), and inserted into the fascia on the serratus posterior superior muscle (\*) near the medial attachment of the serratus posterior superior muscle.

and splenius cervicis muscles, and continued deep to the rhomboid minor muscle.

### **Insertion**

Into the fascia of the serratus posterior superior muscle, near its medial attachment, 3 cm lateral to the midline.

### **Dimensions**

Uniform width of 1 cm and total length of 14 cm. The muscle was unilateral and only present on the right side. The native splenius capitis muscle showed normal anatomical attachment from ligamentum nuchae and the spinous processes of C7 to T3 (or T4) vertebrae to the Mastoid process and the lateral third of the superior nuchal line. Fibres of the splenius capitis accessorius muscle fused with the Serratus posterior superior muscle, suggesting functional integration or possible proprioceptive influence.

## **Discussion**

The splenius capitis is a broad, strap-like muscle situated in the superficial layer of the deep muscles of the back, in the posterior part of the neck.

### **Origin**

From ligamentum nuchae and the spinous processes (C7-T3/T4) vertebrae.

### **Insertion**

Into the mastoid process of the temporal bone and the lateral third of the superior nuchal line of the occipital bone.

### **Innervations**

The posterior rami of the middle cervical spinal nerves.

### **Blood supply**

Occipital and deep cervical arteries.

### **Function**

Acting bilaterally, it extends the head and neck, while unilateral contraction produces lateral flexion and rotation of the head to the same side [3].

Variations of the splenius capitis muscle are rare and often underreported due to their asymptomatic and deep location. A similar bilateral variation of the splenius capitis muscle was previously reported, termed “splenius capitis accessories muscle,” inserting into the fascia over the SPS muscle. The current case is unique due to right-sided presentation, with origin from the mastoid process, an origin site not commonly reported in existing anatomical literature.

Understanding and identifying anatomical variations is fundamental to clinical safety and precision. As highlighted by recent literature, anatomy serves as the “geography of medical practice,” forming the foundational map upon which diagnosis, surgical planning, and procedural accuracy depend. Recognition of muscular variations, such as those in the splenius capitis, is not only of academic interest but also of significant clinical importance. Unidentified variants may lead to misinterpretation during imaging, unexpected intraoperative findings, or inadvertent injury to nearby neurovascular structures. Thus, continuous documentation of such anomalies enriches anatomical databases and enhances clinicians’ spatial awareness, ultimately improving surgical outcomes and reducing diagnostic errors [4].

Variants of the splenius capitis muscle are infrequently observed and tend to be underrepresented in anatomical literature due to their subtle presentation and superficial location beneath the trapezius muscle. The unilateral splenius capitis accessories muscle observed in this case, originating from the mastoid

process and inserting into the fascia over the Serratus Posterior Superior (SPS), represents a distinct variation not commonly documented in anatomical literature. This splenius capitis accessories muscle traverses superficial to the native splenius capitis and splenius cervicis, and deep to the rhomboid minor, before fusing with the serratus posterior superior, a pattern suggestive of an anomalous developmental pathway.

Such variations have clinical relevance, particularly in differential diagnosis. Aberrant muscle formations in the posterior neck may resemble lymph node enlargements or soft tissue lesions during radiological evaluation, potentially resulting in incorrect diagnoses or unwarranted clinical procedures, especially in oncology or neurology settings [5].

Furthermore, muscular anomalies in this region may serve as potential contributors to myofascial pain syndromes due to their abnormal tension vectors and insertion sites [6].

A similar case of bilateral splenius capitis accessories muscle variation has been reported, documented, naming it “splenius capitis accessories muscle,” due to its similar path and insertion into the fascia over the serratus posterior superior [7,8].

In contrast, the present case highlights a unilateral occurrence in an adult cadaver, further emphasizing the need for detailed anatomical knowledge during neck surgeries, radiologic assessments, and pain management procedures [9].

## Ethical Considerations

The dissection was carried out at the Department of Rachana Sharir, National Institute of Ayurveda, Jaipur, in line with the institute's ethical standards. The cadaver was obtained through the institute's cadaver donation program [Maharishi Dadhichi Dehadan Yagya Upkarma].

After receiving, the cadaver was preserved in formalin using Arterial Embalming Fluid and Chemical as per Embalming Principles and legal aspects [ML. Ajmani, JAYPEE Publisher, chapter 07, Page no. 116].

All dissections were performed in accordance with accepted ethical standards for working with human cadavers within the scope of anatomical education. All care was used to preserve dignity and anonymity, and no identifying information regarding donors was ever released or recorded. The research was conducted within the scope of normal academic coursework, and institutional approval was granted before the dissection and associated observations were initiated.

## Conclusion

In conclusion, awareness and reporting of such rare muscular variants are crucial for anatomists, surgeons, radiologists, and clinicians to enhance anatomical understanding and avoid clinical misinterpretation. Further studies and cadaveric surveys may help establish the incidence and developmental significance of such variations.

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