ORIGINAL RESEARCH PAPER
Volume - 15 | Issue - 09 | September - 2026 | PRINT ISSN No. 2277 - 8179 | DOI : 10.36106/ijsr
INTERNATIONAL JOURNAL OF SCIENTIFIC RESEARCH

RECTUS STERNALIS MUSCLE: A RARE ANATOMICAL VARIATION- A CASE REPORT

Anatomy

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ABSTRACT

The rectus sternalis is a rare anatomical variant of the anterior thoracic wall musculature. During routine cadaveric dissection in the Department of Anatomy, we encountered a unilateral left-sided rectus sternalis muscle in the pectoral region, lying parallel to the sternum and superficial to the pectoralis major muscle. The muscle appeared as a vertically oriented muscular band with distinct anatomical features, making it an unusual finding during routine dissection. Although the rectus sternalis is considered a normal anatomical variation, its incidence is low, and its embryological origin remains controversial. Owing to its variable morphology and infrequent occurrence, it is often overlooked during clinical evaluation and may be mistaken for pathological conditions such as breast masses or other anterior chest wall lesions on mammography, computed tomography, and magnetic resonance imaging. Unfamiliarity with this muscle may also create unexpected findings during breast, thoracic, and reconstructive surgical procedures, potentially leading to diagnostic errors or intraoperative confusion. Careful documentation and reporting of such anatomical variations are therefore essential to improve anatomical knowledge and clinical awareness. Furthermore, recognition of the rectus sternalis muscle may be beneficial in reconstructive surgery, where it can serve as a potential muscle flap in selected cases. The present case contributes to the existing anatomical literature by documenting a rare unilateral left-sided rectus sternalis muscle and emphasizes the importance of identifying this variation during cadaveric dissection. Knowledge of this uncommon muscle may assist anatomists, radiologists, and surgeons in accurate diagnosis, appropriate surgical planning, prevention of avoidable complications, and successful execution of interventional procedures involving the anterior thoracic and pectoral regions.

KEYWORDS

Rectus sternalis, cadaver, pectoralis major, Anatomical variation.

INTRODUCTION

The rectus sternalis muscle is also known as sternalis muscle. It is an uncommon anatomical variation of the anterior chest wall musculature.[16] It was first described by Cabrolius in 1604, as reported by Turner.[2] Although this muscle has been recognized since the 17th century, numerous studies and case reports have continued to document its occurrence and anatomical variations. The sternalis muscle is regarded as a normal anatomical variant, yet it is inadequately described in many standard anatomy textbooks.[3,4,5] Variations also exist in its nomenclature and classification. In Gray's Anatomy, it is described as a variation of the pectoralis major muscle and referred to as the rectus sternalis, whereas Larsen's Human Embryology considers it a derivative of the rectus column and names it the sternalis muscle.[1,6] The sternalis muscle may occur either unilaterally or bilaterally and sometimes associated with the variation of pectoralis major muscle.[7,8]

MATERIALS AND METHOD

The dissection is carried out as per Cunningham's manual of practical anatomy

- First vertical incision is given from jugular notch (suprasternal notch) to xiphoid process.
- Second horizontal incision is given from jugular notch to acromian (lateral end of the clavicle).
- Third oblique incision from xiphoid process to axilla in such a way that nipple should be left as it is by giving a circular incision around.
- Fourth horizontal incision from xiphoid process to midaxillary line.[9]

The skin and superficial fascia were carefully reflected laterally using blunt dissection. Subsequently, the fascia and surrounding connective tissue over the anterior part of the pectoralis major muscle and surrounding area were removed to expose the underlying structures. During the dissection, we encountered an additional muscle, the rectus sternalis.

Case Report

During routine undergraduate dissection of the pectoral region, a unilateral rectus sternalis muscle was encountered in an approximately 75- 80-year-old embalmed male cadaver. After reflecting the skin and superficial fascia by blunt dissection and removing the fascia over the anterior surface of the pectoralis major muscle, an accessory muscle was identified on the left side of the anterior thoracic wall.

The muscle appeared as a narrow, vertically oriented muscular slip situated superficial to the pectoralis major muscle and its fascia and parallel to the left border of the sternum. Inferiorly, it was seen to arise from the pectoral fascia in continuity with the aponeurotic fibres of the external oblique muscle at the level of the lower costal cartilages. From its origin, the muscle ascended vertically over the pectoralis major towards the upper part of the sternum. The superior end gradually became tendinous and blended with the fascia over the upper anterior chest. No similar muscle was observed on the right side.

The rectus sternalis muscle was carefully cleaned, preserved, and photographed for documentation. The surrounding muscles and neurovascular structures appeared normal.

This rectus sternalis muscle originates from the anterior aspect of the body of the sternum, just inferior to the sternal angle, and descended as a narrow muscular slip. Inferiorly, it is inserted into the aponeurosis of the external oblique muscle of the anterior abdominal wall.

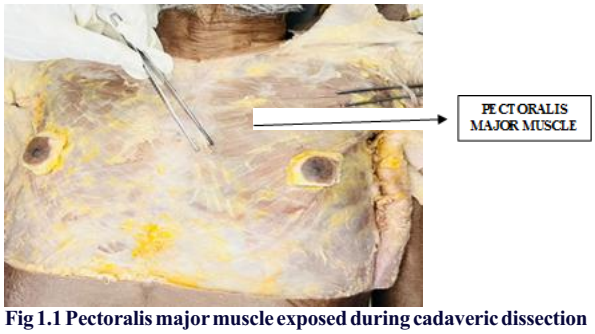

Fig 1.1 Pectoralis major muscle exposed during cadaveric dissection

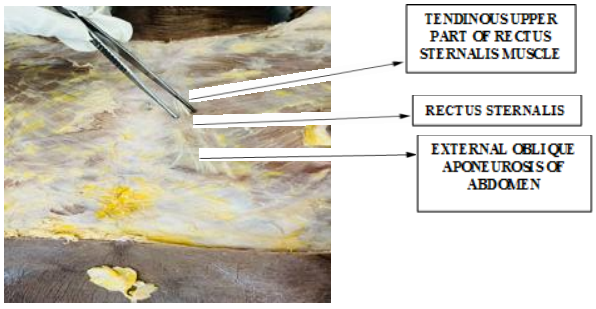

Fig 1.2. Unilateral left-sided rectus sternalis muscle.

DISCUSSION

The sternalis muscle is an uncommon anatomical variant consisting of a vertical or longitudinal band of muscle fibers situated adjacent to and usually parallel to the sternum.[16] Its size and shape may vary considerably. It commonly originates from the rectus sheath, the aponeurosis of the external oblique muscle, the pectoralis major muscle, or the costal cartilages. Superiorly, it may insert into the upper costal cartilages, the manubrium of the sternum, or blend with the sternal head of the sternocleidomastoid muscle.[1]The sternalis muscle exhibits considerable anatomical variation, including the absence of the abdominal slip from the external oblique aponeurosis, variation in the number of costal attachments, varying degrees of separation between the clavicular and costal parts, decussation of the right and left muscles across the sternum, and the presence of superficial vertical slips extending from the lower costal cartilages and rectus sheath to the sternocleidomastoid muscle, upper sternum, or upper costal cartilages.[1]

The prevalence of the sternalis muscle shows considerable variation among different populations. It has been reported in approximately 4–7% of the White population, 8.4% of the Black population, and 11.5% of the Asian population.[10] In certain groups, such as the Taiwanese population, the incidence may be as low as 1%.[11] Whereas studies in the Turkish population have reported an incidence of 9.3%.[12] The sternalis muscle may become more prominent when associated with partial or complete congenital absence of the pectoralis major muscle.[13]

In the present study, a unilateral left-sided sternalis muscle was identified during routine cadaveric dissection in the Department of Anatomy. The muscle was located parallel to the left border of the sternum and superficial to the pectoralis major muscle. The origin and insertion of the muscle were carefully documented. Although the embryological origin of the sternalis muscle remains uncertain, it is thought to result from abnormal migration or persistence of muscle primordia during development.

Three principles—migration, fusion, and separation—have been proposed to explain nerve–muscle specificity. According to the principle of migration, the nerve supply indicates the pathway of muscle migration. The principle of fusion suggests that a muscle supplied by two different nerves may have formed by the fusion of two separate muscle masses, whereas the principle of separation proposes that two muscles supplied by a common nerve may have originated from a single muscle mass. These principles may help explain the variable innervation and possible developmental origin of the sternalis muscle.[14]

Although the sternalis muscle is a rare anatomical variant, it has considerable clinical importance. It may be identified incidentally on imaging modalities such as mammography, magnetic resonance imaging (MRI), and computed tomography (CT). On routine mammography, the sternalis muscle may appear as a medial density on the craniocaudal view with indistinct or ill-defined margins, which can be mistaken for a breast lesion or carcinoma, leading to diagnostic confusion. Therefore, awareness of this anatomical variation is essential for accurate radiological interpretation and to avoid unnecessary investigations or surgical interventions.[15]

The present case demonstrates a unilateral left-sided sternalis muscle with origin from the anterior aspect of the body of the sternum just below the sternal angle and insertion into the external oblique aponeurosis of the abdomen. Although the sternalis muscle has been described with variable origins, insertions, and morphologies, this pattern represents one of the recognized anatomical variations. Careful documentation of such variations is important because they enhance the understanding of anterior thoracic wall anatomy and provide valuable information for anatomical education, cadaveric studies, and future clinical and surgical correlations.

CONCLUSION

The sternalis muscle is a rare anatomical variant with considerable variability in its morphology, origin, insertion, and innervation. The present case of a unilateral left-sided sternalis muscle adds to the existing anatomical literature and highlights the importance of recognizing this uncommon variant during cadaveric dissection and clinical practice. Awareness of the sternalis muscle is essential for anatomists, radiologists, and surgeons to avoid misinterpretation during imaging, facilitate appropriate surgical planning, and improve the understanding of anterior chest wall anatomy. Documentation of such rare anatomical variations also contributes to anatomical education and serves as a valuable reference for future research.

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