

## Case Report

### An Unilateral Rectus Sternalis Muscle: It's Clinical Significance

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#### Abstract

Knowledge concerning the variations of chest wall musculature is imperative for Surgeons, Radiologists and Anatomists. Rectus sternalis is a variant chest wall muscle found in the anterior thoracic wall along the side of sternum. The presence of this muscle may be mistaken for tumor on mammogram, and causes implications during mastectomy, implant reconstruction surgeries of mammary gland and may necessitate modifying the approach during mammoplasty. The early detection of this variant muscle is necessary for assessing proper dissection planes in breast surgeries and radiological examination. Hereby, we report a case of unilateral rectus sternalis muscle. The muscle originated from the fascia covering external oblique muscle inserted in to the sternum at the manubrio sternal joint; the muscle belly was 10 cm in length and 1.5 cm in width.

**Keywords:** Chest wall musculature, rectus sternalis, mammogram, mammoplasty, breast reconstruction

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#### Introduction

The rectus sternalis muscle is a small supernumerary muscle present in the anterior thoracic wall superficial to the sternocostal fibers of pectoralis major muscle. Cabrol named it for the first time in the year 1604; later Du puy described it accurately in the year 1726 (1). It is also referred as the sternalis, the episternalis, the rectus thoracis, and the superficial rectus abdominis (2). This muscle has been reported both in males and females, it is most commonly unilateral than bilateral and the frequency varies among different ethnic groups being lowest in Taiwanese 1% (3). The incidence of this muscle within Asians is 11.5% (4). Though rectus sternalis muscle is well reported in literature its origin, insertion and nerve supply is unclear and debatable. Several authors suggest that it originates from adjacent muscles such as

sternocleidomastoid muscle, pectoralis major muscle and the rectus abdominis (or) a remnant of panniculus carnosus (5). Hereby, we report a case of unilateral rectus sternalis muscle.

#### Case Report

During regular dissection of pectoral region of a 60-year-old male embalmed cadaver revealed rectus sternalis muscle on its left side. It was located on the anterior thoracic wall in a paramedian position deep to the skin and superficial fascia of the pectoral region, but superficial to the pectoral fascia and sternocostal fibers of pectoralis major muscle. It originated as a small tendon from the aponeurosis of the external oblique muscle, from the fascia of the rectus abdominis, ran upwards along the left side of sternum, finally inserted in to the sternum at the



**Figure 1:** Showing the rectus sternalis muscle. RS; Rectus sternalis, PM; Pectoralis major

manubriosternal joint (Fig.1). It was measured 10 cm in length and 1.5 cm in width in the middle of the muscle. It was innervated by intercostal nerves. The pectoralis major muscle was normal.

### Discussion

Rectus sternalis is a supernumerary muscle of pectoral region. Embryologically this muscle is derived from ventral longitudinal column of muscle arising from ventral tip of hypomeres which is represented by the infrahyoid muscles in the neck, rectus abdominis in the abdomen and occasionally by the rectus sternalis in the thorax (5). Morphologically the muscle may be the remnant of panniculus carnosus (or) might have derived from pectoralis major with its innervations from pectoral nerves (or) from the rectus abdominis with innervation from intercostal nerves (6).

However presence of this muscle is clinically important. Presence of this muscle may be mistaken as a tumor on the mammogram as it appears as focal dense spot along the side of sternum, and it causes difficulty in interpretation of mammograms by radiologists. It may appear as hernia of pectoralis major muscle and may confuse the examining physician and it may cause abnormalities in ECG (7). It appears as a mass require surgical resection (8). If the muscle is encounter during modified radical mastectomy it must be excised because part of mammary gland may present deep to the muscle. Leaving this muscle behind is detrimental to the oncological surgery of the breast (9). It will interfere during mammoplasty where the sub muscular pocket dissection is avoided and intraalveolar (or) submammary approach is used. However, it is used to cover the medial aspect of the prosthesis in mammoplasty. This muscle is useful to hold the

prosthetic implants in position in esthetic breast augmentation surgeries (10). Most surgeons and radiologists are not aware of this usual variant of chest wall musculature. Awareness about this variation is important for radiologists for clear interpretation of CT, MRI and mammogram. Surgeons should be familiar of this variation during breast surgeries; it should not be mistaken for recurrence of malignancy at later stage. The function of this muscle is insignificant it can be used as a flap in the plastic and reconstruction surgeries of head and neck.

### References

1. Arraez-Aybar LA, Sobraoo-perez J, Merida velasco JR. Left musculus sternalis. *Clin Anat* 2003; 16(4): 350-354.
2. Kida MY, Izumi A, Tanaka S. Sternalis muscle topic for debate. *Clin Anat* 2000; 13(2):138-140.
3. Jeng H, Su SJ. The sternalis muscle: an uncommon anatomical variant among Taiwanese. *J Anat* 1998; 193(Pt 2):287-288.
4. Barlow RN. The sternalis muscle in American whites and Negroes. *Anatomical Record* 1935; 61:413-426.
5. Kumar H, Rath G, Sharma M, Kohli M, Rani B. Bilateral sternalis with unusual left sided presentation: A clinical perspective. *Yonsei Med J* 2003; 44(4):719-722.
6. Saeed M, Murshid KR, Rufai AA, Elsayed SE, Sadiq MS. Sternalis. An anatomic variant of chest wall musculature. *Saudi Med J* 2002; 23(10):1214-1221.
7. Glasser SP. Electrocardiogram of the month. *J La State Med Soc* 1975; 127(4):136-150.
8. Bradley FM, Hoover HC, Hulka CA *et al.* The sternalis muscle an unusual normal finding seen on mammography. *Am J Roentgenol* 1996; 166(1):33-36.
9. Kabay B, Akdogan I, Ozdemir B, Adiguzel E. The left sternalis muscle variation detected during mastectomy. *Folia Morphol (Warsz)* 2005; 64(4):338-340.
10. Khan UD. Use of the rectus sternalis in augmentation mammoplasty case report and literature search. *Aesthetic Plast Surg* 2008; 32(1):21-24.