

Bilateral Rectus Sternalis Muscle: An Anatomical Variant of Anterior Chest Wall

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Abstract: ***Introduction:** Rectus Sternalis muscle, an uncommon anatomical variant of the chest wall musculature located in the anterior thoracic wall, superficial and perpendicular to the pectoralis major and parallel to the sternum. It is regularly present in lower animals and is occasionally detected in humans. A Cadaveric study which was done and the details of this muscle has been presented to establish the importance of Rectus Sternalis. **Methods:** The study was undertaken on 22 embalmed adult human cadavers irrespective of age and sex used for undergraduate dissection from the Department of Anatomy, Osmania Medical College over a period of 2 years. In this present study, in an elderly male cadaver, a normal anatomical variant of anterior chest wall musculature was found. Photographs and details of this muscle were taken after cleaning the dissected region. **Results:** In the present study, three slips of rectus sternalis was seen on either side of sternum in anterior chest wall, which were bifurcating below and blending with external oblique aponeurosis, above into the pectoral fascia superficial to pectoralis major muscle. **Conclusion:** Rectus Sternalis is a rare but a normal anatomical variant in the anterior chest wall musculature and knowledge on it is important, for interventional and diagnostic procedures which are related to this region*

Keywords: Pectoralis major (PM), Rectus sternalis (RS)

1. Introduction

Rectus sternalis is an occasional muscle, disposed longitudinally along the side of sternum and in front of pectoralis major. It is a derivative of superficial part of rectus abdominis and supplied segmentally by intercostal nerves. The abdominal slip from the aponeurosis of the external oblique is sometimes absent. The number of costal attachments and the extent to which the clavicular and costal parts are separated vary. Right and left muscles may decussate across the sternum. A superficial vertical slip, or slips, may ascend from the lower costal margins and rectus sheath to blend with the sternocleidomastoid or to attach to the upper sternum or costal cartilages⁽¹⁾. This is sternalis (rectus sternalis). The muscle may be partially or completely absent. Rectus Sternalis muscle, an uncommon anatomical variant of the chest wall musculature found regularly in lower animals and occasionally detected in humans. Although first formal description of this muscle was given by Dupuy in 1726⁽²⁾, it was demonstrated a century earlier by Carbollius in 1604.

The incidence is 11.5% in Asian population and 4-8% in Indian population⁽³⁾. Rectus Sternalis is twice as often unilateral as it is bilateral⁽⁴⁾

Sternalis muscle to be derived from neighbouring muscles, such as pectoralis major, rectus abdominis, sternocleidomastoid, panniculus carnosus and external oblique.

Various names of this muscles i.e. Sternalis, Rectus thoracis, Presternalis, Muscularis sternalis, Parasternalis, Episternalis, etc.⁽⁵⁾

Clinically it may be misinterpreted as a tumour on mammography or as a hernia of the pectoralis major muscle and can also cause alterations in ECG.

2. Materials and Methods

The present study was undertaken on 22 embalmed adult human cadavers irrespective of age, sex used for undergraduate dissection from the Department of Anatomy, Osmania Medical College over a span of 2 years. After the removal of the skin on the anterior chest wall, rectus sternalis muscle was noted bilaterally in an elderly male cadaver.

3. Results

The following variation was encountered during routine dissection of the anterior thoracic region in 22 human cadavers. In the present study, a total of normal anterior chest wall was found in 21 specimens, Variations were found in 1 specimen (4.5%) in which muscle presented with three slips of rectus sternalis muscle on either side of sternum of anterior chest wall blending into external oblique aponeurosis lower below.

4. Discussion

Sternalis muscle (also known as episternalis, presternalis, sternalis brutorum, rectus thoracic, rectus sterni and superficial rectus sterni) is a mysterious muscle that is rarely found on the anterior thoracic wall. This variant muscle is a dilemma for surgeons and radiologists whereas a matter of interest for anatomists. Its size varies from a short thin slip to a long broad band of muscle. Sternalis muscle is a mysterious muscle that is rarely found on the anterior thoracic wall. It is a derivative of the hypaxial myotomes/dermomyotomes from which the ventral and lateral body wall muscles of thorax and abdomen are

developed. Its size varies from a short thin slip to a long broad band of muscle.

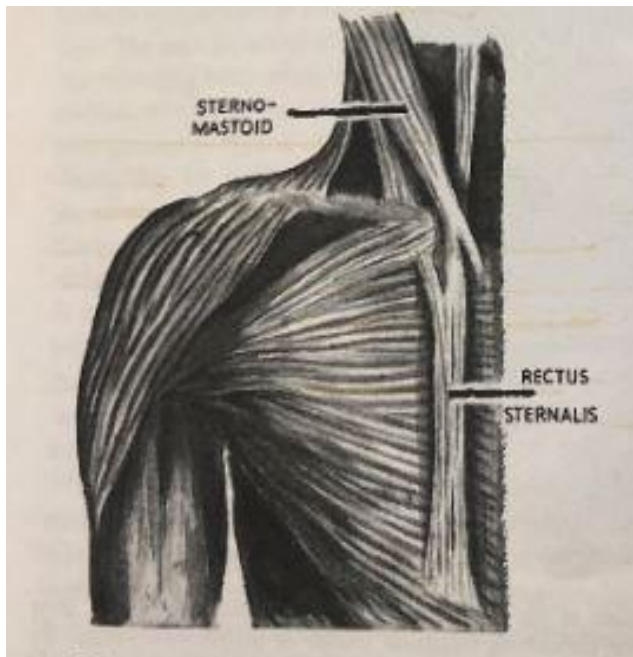
Mehta V et al.,⁽⁶⁾ discussed a more common unilateral occurrence of this muscle and lack of acquaintance of the clinicians. An incidence of 4–8% has been found earlier in Indian subjects⁽⁷⁾. The present study reported an incidence of 4.5%.

Origin and insertion of Rectus Sternalis muscle is still a debatable. Kumar et al.⁽⁸⁾ considers sternalis to be derived embryologically from the ventral longitudinal column of muscle arising from the ventral tip of the hypomeres. This is represented by the infrahyoid muscles in the neck, rectus abdominis in the abdomen and occasionally by the rectus sternalis in the thorax.

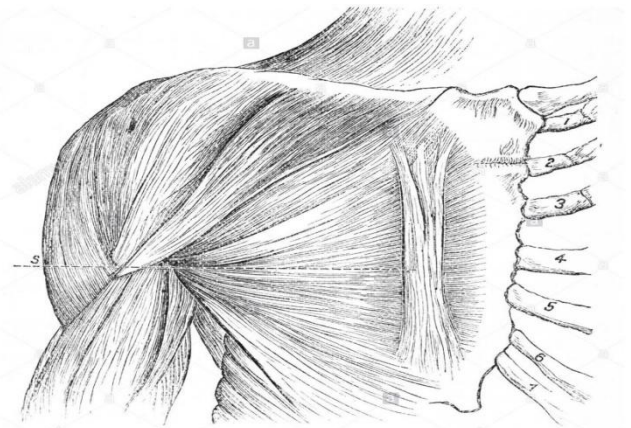
Rectus Sternalis has clinical significance. It can create alterations in ECG⁽⁹⁾

In routine mammography, the subcutaneous location of Rectus Sternalis may be mistaken for a tumour on initial investigation or as a recurrence of a cancer during post-treatment check-ups⁽¹⁰⁾. This confusion can be cleared by CT and MR imaging. It can also be used to cover the prosthesis in its most medial part during the procedure of augmentation mammoplasty⁽¹¹⁾. Recto Sternalis can be used as a muscle flap in anterior chest wall, head and neck, and in breast reconstructions⁽¹²⁾. During radiotherapy the depth at which internal thoracic nodes are irradiated may vary in presence of this muscle⁽¹³⁾

Hence, the knowledge on this muscle is important, for a surgeon to identify it early during the decision making of an appropriate dissection plane.



the anterior thorax, and knowledge on it is important for performance of interventional and diagnostic procedures. Negligence of this muscle can cause negative changes in prognosis of patient. When detected intraoperatively during mastectomy for carcinoma of the breast, it should ideally be removed for complete clearance of the breast tissue. New advances in reconstruction surgery by using Rectus Sternalis muscle flap are possible. Since there are no reliable clinical tests to verify the presence of these anomalous muscle slips, awareness of this muscle is of paramount importance to the general, plastic surgeons and radiologists during clinical approaches.

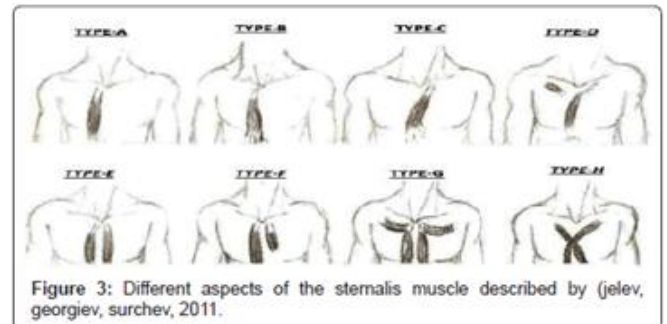
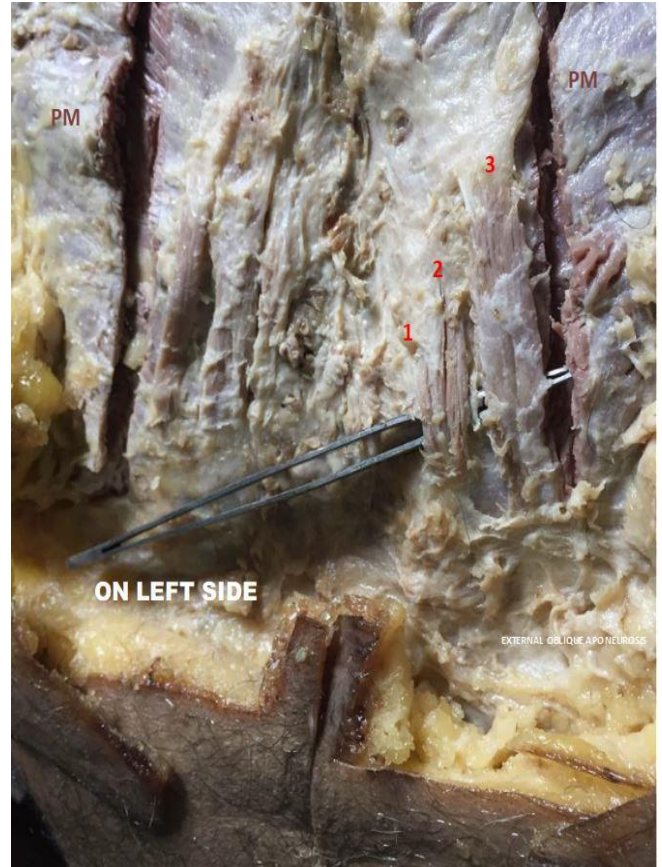
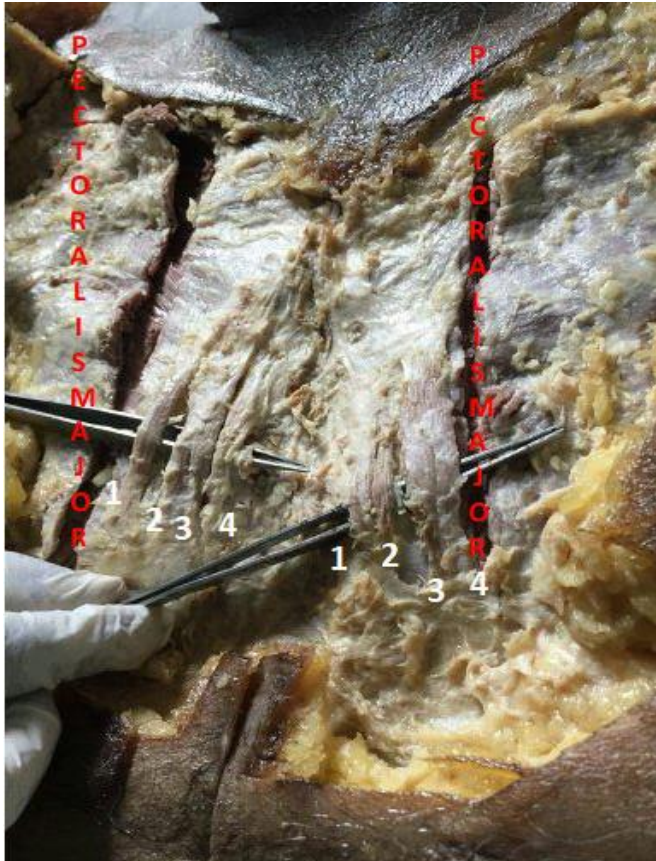


Slips of rectus sternalis bilaterally



5. Conclusion

Rectus Sternalis is a rare superficial misplaced muscle tissue, arising from variable sources in a localized region at



References

- [1] Williams PL, Bannister LH, Berry MM. Gray's anatomy. 38th Ed. New York; Churchill Livingstone; 1995;838.
- [2] Arraez-Aybar LA, Sobraoo-perez J, Merida velasco JR. Left musculus sternalis. Clin Anat. 2003; 16(4): 350-354.
- [3] Kulkarni DU, Kulkarni UK. Unilateral Rectus Sternalis muscle- A case report. Al-Ameen J Med Sci. 2010; 3(2):169-171.
- [4] Loukas M, Bowers M, Hullett J. Sternalis muscle: a mystery still. Folia Morphol2004; 63:147-49.
- [5] M. N. O'Neill and J. Folan-Curran, "Case report: bilateral sternalis muscles with a bilateral pectoralis major anomaly," Journal of Anatomy, vol. 193, no. 2, pp. 289-292, 1998.)
- [6] Mehta V, Arora J, Yadav Y. Rectus thoracis bifurcalis: a new variant in the anterior chest wall musculature. Rom J Morphol Embryol.2010; 51(4):799-801.
- [7] Shah AC. The Sternalis muscle. Indian J Med Sci. 1968; 22(1):46-47.

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- [8] 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.
- [9] A.Raikos, G. K. Paraskevas, M.Tzika et al., "Sternalismuscle: an underestimated anterior chest wall anatomical variant," *Journal of Cardiothoracic Surgery*, vol. 6, no. 1, article 73, 2011.
- [10] Bailey PM, Tzarnas CD. The Sternalis muscle: a normal finding encountered during breast surgery. *Plast Reconstr Surg*. 1999 May;103(4):1189-90.
- [11] Khan UD: Use of the rectus sternalis in augmentation mammoplasty: case report and literature search. *Aesthetic Plast Surg*. 2008, 32:21-24.
- [12] Athasios R, George K, Maria T, Pedro F, Stefanos T, Panagiota K et al. Sternalis muscle: an underestimated anterior chest wall anatomical variant. *J Cardiothoracic Surg*. 2011; 6:73.
- [13] T. Preeti, B. Harsha, G. Ujwal et al., "The bilateral sternalis: an uncommon anatomical variant," *Journal of Clinical and Diagnostic Research*, vol. 6, no. 5, pp. 767-769, 2012