

## Unilateral Rectus Sternalis Muscle – A Case Report

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### Abstract

Occasionally a vertical strip of muscle is seen in front of sternum, which is named as 'Rectus sternalis (sternalis) muscle'. This muscle is considered as part of vertical strip of muscles (strap muscles present from chin to pubis). A rare case of unilateral left sided sternalis muscle was found during routine dissection, the details of which is presented in this case report.

*Keywords:* Sternalis, Rectus sternalis.

### Introduction

Rudiments of various muscles have been observed in many parts of human body and not a few muscles which are regularly present in some of the lower animals can be occasionally detected in man, in a greatly reduced condition. An excellent illustration is "sternalis muscle".

- Charles Darwin [1]

Sternalis muscle was first mentioned by Cabrollius in 1604, but the formal description of this muscle was given by Dupuy in 1726 [2]. Various names have been coined for this muscle like sternalis muscle, Muscularis sternalis, episternalis, presternalis, sternalis brutorum, rectus thoracis, rectus sternalis, japonicus, thoracicus etc.

### Materials and Method

In the Dept. of Anatomy during routine dissection of an adult male cadaver of Indian origin, variation was noted. Unilateral, left sided sternalis muscle was found, which was dissected, cleaned & the specimen was photographed.

### Observations



Left Sternoleidomastoid

Left Pectoralis major

Left Sternalis

- a) *Situation:* During routine dissection extra muscle was found- unilaterally on the left side in the pectoral region. This muscle was vertically present parasternally. The fibres of this muscle were at right angle to the fibres of pectoralis muscle. It was situated between the anterior thoracic superficial fascia & pectoral fascia, that is muscle was superficial to pectoralis major muscle & its fascia.
- b) *Attachments:* Upper half of the muscle was tendinous & the lower half was fleshy. The tendinous upper end was merging with the lower end of left sternocleidomastoid muscle. The lower end of this extra muscle was fleshy, flat, ribbon like & was 5.2 cms wide. This lower end was attached to superficial surface of left pectoralis major muscle by fascia at the level of xiphisternal joint. This insertion was very close to the origin of left rectus abdominis muscle, but there was no continuity between the muscle fibres of both.
- c) *Nerve supply:* Two small twigs of nerves were seen piercing the muscle from the deeper aspect. The small twigs could not be traced to their original trunks. But however their arrangement one above another, their location parasternally indicates their likely continuation with the left anterior intercostal nerves.

Jelev in 2001 defined the characteristics of sternalis muscle as follows.

1. Situation between anterior thoracic superficial fascia & pectoral fascia.
2. Origin – Sternum or intraclavicular region.
3. Insertion – rectus sheath or costal cartilages or lower ribs or external oblique aponeurosis [3].

The present muscle fulfills all above criteria hence it can be safely called as “Sternalis Muscle”.

### **Discussion**

- a) *Incidence:* Incidence of this muscle varies with sex, race & ethnicity. In Europeans it was 4.4%, in Africans 8.4%, Asian 11.5%, Indians 4.8%, Japanese 31.1%, Chinese 1%. Average range of incidence is 3 – 6 %. It may be unilateral or bilateral [2].
- b) *Origin & Insertion:* Jelev described this muscle originating from sternum or intraclavicular region & inserting into rectus sheath, costal cartilage, or lower ribs. In Gray’s Anatomy this muscle is described as ascending from lower costal cartilages & rectus sheath to blend with sternocleidomastoid muscle or to attach to the upper sternum or costal cartilages [4].
- c) *Nerve supply:* Two sets of nerves are closely related to this muscle
  1. Harish & Gopinath described that pectoral nerves supply the sternalis muscle. They also state that sternalis fibres are derivatives of pectoralis major fibres [5].
  2. Shah, Jelev, Yap, Barlow say that anterior Cutaneous branches of intercostal nerve supply this muscle & sternalis fibres are upward continuation of rectus abdominis fibres [6-8].
- d) *Action:* From its peculiar location & direction of fibres there is a possibility that this muscle may help in elevating the lower chest wall.

e) *Development:*

- i) Sternalis may be derived from primitive ventral, longitudinal muscle sheet which also gives rise to rectus abdominis, sternocleidomastoid muscles. This is supported by the findings that sternalis muscle fibres are many times continuous with either sternocleidomastoid or rectus abdominis or both (Sadlar) [9].
- ii) Sternalis could be separated fibres of pectoralis as indicated by a – Pectoral nerve supplying both (Harish, Gopinath) b – Sternalis muscle is accompanied by partial deficiency of pectoral major muscle.
- iii) Sternalis represents the remains of ‘panniculus carnosus’ which is supported by its position superficial to pectoral fascia & nerve supply by anterior Cutaneous branches of intercostal nerves.

Study by Eisler on anencephalic fetuses strongly showed large proportion (48%) with sternalis muscle. This would seem to indicate either a neurological or embryological answer to the problem of sternalis muscle [10].

f) *Applied:*

- 1) Routine mammography may show an unusual bulge in the median mammary region (the sternalis) which it self could be mistaken for a tumour on initial investigation or as a recurrence of a cancer during post treatment checkups. This confusion can be cleared by CT & MRI imaging.
- 2) During mastectomy sternalis is rare muscle encountered in the subcutaneous plane. Hence it is important to be aware of this rare entity & identify the muscle early so that dissection plane is appropriate. Also some breast tissue extending deep to the muscle should not be neglected during surgery.
- 3) In Radiation therapy the depth at which internal mammary nodes are irradiated may also vary in the presence of this muscle.

At last, sternalis may be nothing more than misplaced developed muscle tissue, arising from variable sources in a localised region at the anterior thorax, and serving no apparent function but to befuddle diagnosticians.

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