Case Report

Sternoclavicularis - A variant of Pectoralis Major Muscle

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Abstract:

A rare muscle sternoclavicularis was found in a large triangular gap between the sternocostal and clavicular heads of Pectoralis Major muscle on the right side during routine cadaveric dissection. Sternoclavicularis was seen to arise from the anterior surface of manubrium sterni and the capsule of sternoclavicular joint and was inserted on the anterior surface of middle one third of the clavicle. It was supplied by the lateral pectoral nerve. Sternoclavicularis muscle may help in stabilizing the clavicle and may partially fill the triangular deficit in the origin of the Pectoralis Major. This variation may be of particular interest to plastic surgeons, orthopaedic surgeons, radiologists and neurologists. It may mimic a tumour at this site.

Key Words: pectoralis major, sternoclavicularis muscle, anatomical variation

Introduction:

The pectoralis major muscle (PM) is a thick triangular muscle that usually arises from the medial half of the anterior surface of clavicle, the sternum, and the upper six costal cartilages and the upper part of the aponeurosis of external oblique muscle of abdomen. These three heads, the clavicular, sternocostal and abdominal, combine to form a tendon that inserts into the lateral lip of bicipital groove of humerus. The pectoralis major muscle is innervated by the medial and lateral pectoral nerves (Johnson & Ellis, 2005).

A number of variations of PM have been reported in literature, such as partial or complete absence of sternocostal portion, accessory head arising from serratus anterior muscle, absence of abdominal slip and decussation of fibers across the midline (Kida et al, 2000; Mosconi & Kamath, 2003; Loukas et al, 2006; Johnson & Ellis, 2005). Presence of additional musculature in the pectoral region have also been reported such as sternalis (O'Neill et al, 1998); Pectoralis quadrats (Bergman et al, 1988; Bonastre et al, 2002) and Chondroepitrochlearis muscle (Loukas et al, 2005). In the present case report, a rare anomaly of the PM is reported and is discussed in the light of available literature.

Case report:

During routine dissection, a large triangular gap was observed between the sternocostal and clavicular fibers of right Pectoralis Major muscle (Fig. I). Further cleaning and dissection showed an anomalous muscle occupying the base of this triangular gap (Fig. II). It originated from the anterior surface of the manubrium and capsule of the sternoclavicular joint. The muscle was directed upwards and laterally, passing deep to the clavicular fibers of the Pectoralis major. It was inserted on the anterior surface of middle one third of the clavicle, and was supplied by the lateral pectoral nerve. The subclavius muscle was normal and was placed deep to this anomalous muscle (Fig. III).

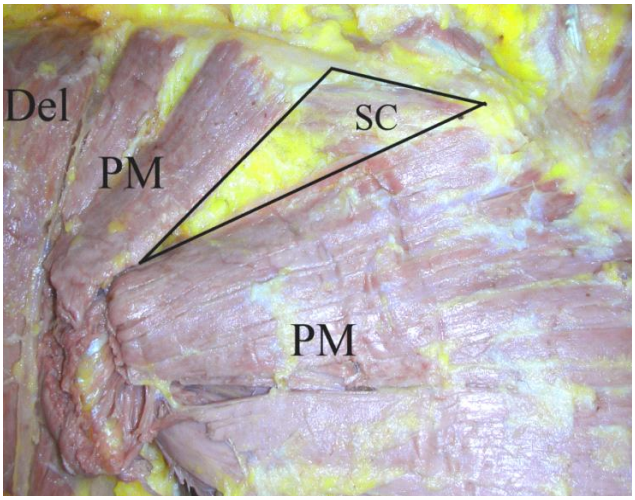

Fig. I: Right pectoral region showing triangular deficit between sternocostal and clavicular head of Pectoralis Major muscle.

Discussion:

Number of variations of PM and presence of supernumerary muscle in the pectoral region have clinical importance. The existence of these variants

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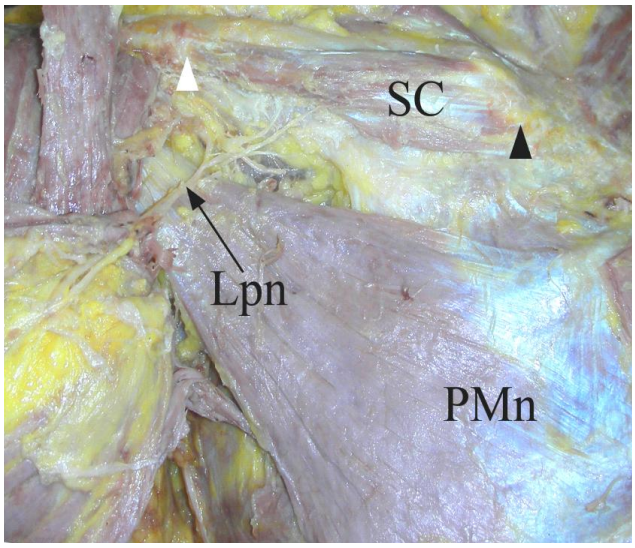

Fig II: Sternoclavicularis muscle originating from the anterior surface of manubrium streni and capsule of sternoclavicular joint (Black arrow head) and inserted on the anterior surface of middle part of clavicle (White arrow head). A branch of lateral pectoral nerve (Lpn) is seen entering this muscle.

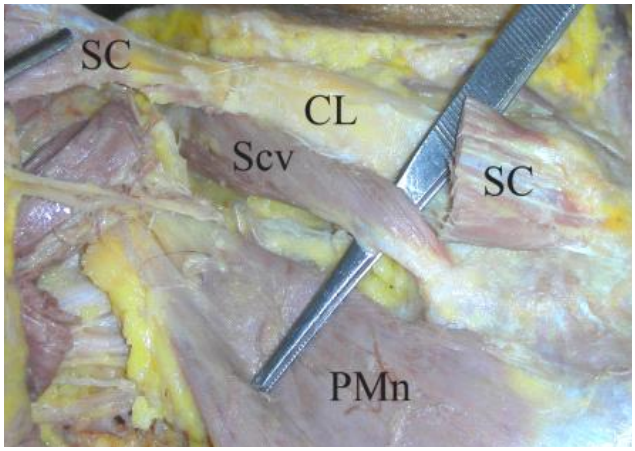

Fig. III: Subclavius muscle (Scv) was normal in its disposition lying deep to sternoclavicularis muscle (SC) which has been cut and retracted. *(Abbrevations used in Figur I, II & III: PM - Pectoralis Major; Del-Deltoid; SC - Sternoclavicularis; PMn- Pectoralis minor; CL - Clavicle)*

can be explained by reviewing its development. Molecular studies indicate a crucial role of the fibroblast growth factors (FGFs) in the limb initiation and role of *Hox*genes in the differentiation of somites and regulation of cell proliferation (Larson, 2001). Fibroblast growth factors from the apical ectodermal ridge of developing limb activates zone of proliferating activity, which causes expression of the sonic hedgehog genes. Molecular studies show that sonic hedgehog genes secretions control the patterning of the limb (Moore & Persaud, 2003). The pectoral muscles assume their final forms through a combination of migration, fusion and apoptosis of myoblasts of pectoral sheet (Carlson, 2004). The pectoral sheet divides into superficial ectopectoral layer and deep endopectoral layer (Schafer et al, 1923). The subclavius is regarded as a derivative of the deep layer of the pectoral sheet. The outer lamina is divided into clavicular, presternal and abdominal portions. The sternoclavicularis (SC) arises from the border of presternum and is inserted into the anterior surface of clavicle, as far as or even beyond, the middle third of the bone (Schafer et al., 1923). Supernumerary muscle in the present case report represents the SC. Presence of SC and triangular deficit of PM may be a result of the failure of designated myoblasts of ectopectoral fascia to undergo proper orientation and their subsequent degeneration.

The SC is a rare muscle and has not been described amongst the Indian population. A clinical problem could arise if sternoclavicularis was to be mistaken for a mass or tumour during CT or MRI. The presence of the SC may have positive functional implications. The SC may help in stabilizing the clavicle during various movements. It may effectively pull forward the lateral part of the clavicle which may enhance the functional activity of clavicular part of the PM and may compensate for the triangular deficit of the pectoralis major. This case report illustrates the need for continued reporting of anatomical variations and also their functional and clinical significance.

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