

A rare unreported bilateral thoracic muscle on the inferior and posteromedial aspect of the rib cage: case report and literature review

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Thoracic wall muscles are essential for respiration. Few anatomical variations in thoracic wall muscles have been reported. Such variants must be considered during surgical procedures that involve the thorax muscles. During routine dissection of a 65-year-old male cadaver as part of a fourth-year clinical anatomy elective, additional muscle strips were found in the inner and inferior aspect of the rib cage closer to the posteromedial body wall. The muscle consisted of two strips of narrow muscle fibres originating from the inferior borders of ribs 11 and 12 that radiated to insert on the transverse processes of the T11 and T12 vertebrae. The case report describes an unusual, novel medial thoracic wall muscle that has not been previously described in the literature. Variations in thoracic muscles can affect respiratory function and surgical interventions like chest tube placement and needle therapy for local anaesthesia, therefore, it is important for clinicians to be aware of such variants. (Folia Morphol 2023; 82, 2: 422–423)

Key words: anatomical variations, rare thoracic wall muscle, rib cage, posteromedial wall, T11 and T12 vertebrae

INTRODUCTION

The thoracic wall is composed of 5 muscles that include the external intercostal, internal intercostal, innermost intercostal, subcostal, and transversus thoracis [1]. The intercostal muscles originate from the inferior border of the ribs and insert on the superior border of the inferior ribs. The subcostal muscles are seen in the lower ribs and connect the internal surface of one rib to the superior border of the rib located in two or three intercostal spaces inferiorly. Finally, the transversus thoracis muscles originate from the posterior surface of the lower sternum and insert on the internal surface of the costal cartilage [2]. These muscles are primarily involved in changing

the volume of the thoracic cavity during inspiration and expiration [1]. Posteriorly, the serratus posterior superior and serratus posterior inferior muscles are responsible for elevating the ribs while the levatores costarum muscles depress the ribs [2].

Anatomical variations in the muscles of the thorax have rarely been reported. The most common muscle variant seen in the thoracic region is the sternalis muscle, found in 8% of the population [1]. Clinically, the sternalis muscle can pose diagnostic challenges and lead to surgical malpractice if clinicians remain unaware that such a variant exists [3]. Other thoracic muscle variants have implications for respiratory function and surgical interventions, such as chest tube

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placement and needle therapy for either decompression or anaesthesia.

MATERIALS AND METHODS

The thoracic region of a 65-year-old male cadaver was dissected by faculty members to prepare cadaver prosections for a first-year anatomy course. Using a bone saw, a vertical incision was made from ribs two through nine anteriorly and the parietal pleura was dissected. The anterior thoracic wall was reflected inferiorly, exposing the pulmonary cavities and mediastinum. The lungs and heart were removed. The lateral thoracic cavity and posterior intercostal space was cleared of fascial remnants.

RESULTS

Twelve ribs and their corresponding intercostal veins, nerves, and arteries were identified. Within the lateral thoracic cavity, a novel muscle was seen along the posterior aspect of the ribs (Fig. 1). The novel muscle was seen in the inner and inferior aspect of the rib cage closer to the posteromedial body wall. The unusual muscle consisted of two narrow strips of muscle fibres originating from the inferior borders of ribs 11 and 12 and radiating to insert on the transverse processes of the T11 and T12 vertebrae. The novel muscle strips received blood supply from branches of the 11th and 12th intercostal vessels.

DISCUSSION

This case report describes the presence of an unknown and novel muscle seen in the inner aspect and on the posteromedial side of the rib cage. The muscle consists of narrow strips of two sets of fibres originating from the inferior borders of ribs 11 and 12 and radiating to insert on the transverse processes of the T11 and T12 vertebrae. A thorough literature review did not reveal description of a thoracic muscle with similar origin. Moreover, little information is found regarding variations in the muscles of thoracic wall, with the most common variation being the sternalis muscle, which is an anterior chest wall muscle and found in 8% of patients [1]. More specifically, there is a dearth of knowledge regarding muscle variations of the lateral thoracic cavity despite their known roles in regular respiratory function [1]. The authors did not find this muscle described in either contemporary anatomy textbooks or an encyclopaedia of anatomic variations. Thus, it appears that the variation found in this case report



Figure 1. Novel thoracic muscle on the inferior and posteromedial aspect of the rib cage (dotted line); S — superior; M — medial; I — inferior; L — lateral.

is rare, and there has yet to be any reported cases of this novel muscle.

CONCLUSIONS

Thoracic wall muscles play a crucial role in aiding respiration through altering the volume of the chest cavity in regular physiology. As such, there is significant value in recording and being aware of variations that may affect these crucial structures. As this is a novel variation in a muscle group with a clinically important function, there is no current knowledge regarding any functional or clinical effect of this muscle. The unknown function of this novel muscle variant, as well as its possible clinical relevance in diagnosis, common procedures, and surgical outcomes warrants further study in the future.

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