Unusual muscle fibre arrangement of subscapularis muscle

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Abstract

Introduction
Subscapularis muscle presents various patterns in its muscle fibre arrangement. Most of these patterns were well documented in the literature.

Case report
In the present case, we report an unusual pattern of the origin of the Subscapularis muscle in a 55-year-old male cadaver of South Indian origin. The origin of the Subscapularis muscle presented the multinippate arrangement in the left subscapular fossa. The triangular shaped muscle had upper and lower pennate fasciculi. The upper pennate fasciculi were interdigitating with the lower pennate fasciculi. A small-sized unusual muscle fasciculus of Subscapularis was found to be continuing with the serratus anterior muscle, close to the insertion of the latter.

Conclusion
This fasciculus had an ascending intermuscular septum at the initial portion of the fasciculus. The unusual muscle pattern may be of clinical importance while performing the muscle transposition in the chronic rotator cuff repair in diseases such as rheumatoid arthritis.

Introduction
Subscapularis (SS) is a muscle of the pectoral girdle, taking origin on the costal surface of the scapula and inserting into the lesser tubercle of the humerus. It is a bulky muscle filling the subscapular fossa. The periosseous of the costal surface of the scapula gives attachment to the medial two-third of its fibres. The rest of the fibres are attached to the ridges on the costal surface of the scapula through tendinous intramuscular septa. Laterally, the muscle fibres converge into a large tendon, which inserted into the lesser tubercle of the humerus and also to the anterior surface of the capsule of shoulder joint. The SS is also a part of the musculotendinous cuff (rotator cuff) of the shoulder. Earlier authors have reported the different patterns of the SS muscle fibres. In the present case, we report an unusual pattern of the SS muscle and discuss its embryonic perspective.

Discussion
The SS muscle shows a wide range of variations in its fibre arrangement. Authors have described the various muscle fibre patterns. Schafer has described the presence of three distinct parts of the muscle: upper and lower marginal parallel bundles and an intermediate portion which is consisted of triangular fasciculi merging with the pennate fasciculi. Shaefier has observed a single portion which consisted of triangular fasciculi interdigitating with the pennate fasciculi. Anson demonstrated that a whole muscle was made up of three distinct parts: the upper portion with single bipennate arrangement, the middle intermediate portion with pair bipennate arrangement and the lower portion similar to the middle portion but bigger in size. Canjaruenee et al. have observed the multipennate arrangement of fibres where the muscle was triangular in shape and consisted of upper pennate fasciculi interdigitating with the lower pennate fasciculus. In the present case, we observed multipennate arrangement of the muscle fibres. But contrary to previous reports, we observed an unusual muscle band of SS which was continuing with the SA muscle fibres close to the insertion of the latter.

The SS muscle has a dual nerve supply. It is supplied by the upper and lower subscapular nerves that arise from the posterior cord of brachial plexus. The roots of these two nerves arise from C5 and C6 spinal segments. As this muscle arises from two myotomes, it shares the nerve supply from the nerves belonging to the two myotomes. On other hand, SA develops from the C5, C6 and C7 myotomes and gets nerve supply from the corresponding spinal segments. As both SS and SA share the C5 and C6 myotomes, the unusual muscle fasciculus of SS that is continuous with the SA muscle could be due to errors in the incomplete separation of these myotomes.

SS is one of the rotator cuff muscles, and it is of considerable importance

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Unusual muscle fibre arrangement of subscapularis muscle. The knowledge of the variations of the SS would also be important to physiologists and physiotherapists.

**Abbreviations list**
SA, serratus anterior; SS, subscapularis.

**References**

Figure 1: Picture showing the left subscapular fossa pointing (arrow and held with forceps) the unusual muscle fasciculus (UF) of the subscapularis (SS) muscle continuing with the serratus anterior muscle (SA).

Muscle fibre arrangement is clinically important as it is frequently used for the chronic rotator cuff tears.10,11

**Conclusion**
Cases as the one mentioned in this report would add up to the present knowledge on the variations of the SS owing to its support to one of weakest joints of the human body—the shoulder joint. As SS is the largest muscle among the rotator cuff muscles, its responsibility in shoulder functioning as well as the dynamic stability of the shoulder joint is well reported in the literature.6–9 Knowledge of the SS muscle fibre arrangement is clinically important as it is frequently used for the chronic rotator cuff tears.10,11