CASE REPORT

Congenital bilateral absence of levator scapulae muscles: A case report

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The levator scapulae muscle (LSM) is a bilaterally symmetric muscle that originates from the transverse processes of the first through fourth cervical vertebrae and inserts onto the superior angle of the scapula [1]. The LSM is in contact anteriorly with the middle scalene muscle, laterally with the sternocleidomastoid and trapezius muscles, posteriorly with the splenius cervicis muscle and medially with the posterior scalene muscle [2]. The LSM is innervated by the dorsal scapular nerve, as well as the anterior rami of the C3 and C4 spinal nerves. The primary function of the levator scapulae is elevation of the scapula [1], however it has been suggested that it also assists in downward rotation of the scapula [2]. While it is known that skeletal muscle develops from somites formed during week 7 of gestation [3], little is known regarding the exact origin and development of the LSM. It appears that the LSM develops from the dorsal muscle mass of the upper limb bud [4]. Regardless, it is likely it is derived from 3 or 4 somites, as it is innervated by multiple spinal levels. This article reported a case of bilateral absence of levator scapulae muscle.

DISCUSSION

Numerous case reports have described variation of origin and insertion of the LSM. More common variations include an additional muscle belly originating from the mastoid process and inserting with the main muscle belly at the scapula [5] with additional attachments to the ligamentum nuchae, rhomboid major muscle, and serratus posterior superior muscle [6]. We report dissection of a cadaveric specimen where the levator scapulae muscle was absent bilaterally. While bilateral congenital absence of the levator scapula appears to be an extremely rare occurrence, the absence of this muscle might put neurovascular bundles in the posterior neck and scapular region at increased risk from penetrating trauma or surgical procedures.

Key Words: Levator scapulae; Anatomical variation; Congenital absence

Figure 1) Superficial dissection of the posterior neck showing bilateral absence of levator scapulae muscle. The figure shows the dorsal scapular nerve (yellow) and the suprascapular and deep branches of transverse scapular arteries (red). The splenius capitis (SC), trapezius (T), omohyoid (O), serratus posterior superior (SPS), supraspinatus (Sp), and the rhomboid minor and major (Rm and RM, respectively) muscles are labeled for reference.

Other variations have been documented including additional or the absence of slips originating from variable transverse processes, slips attached to the trapezius or splenius capitis muscles or scapular spine, and an additional slip underlying the main muscle belly [7]. An MRI study of 37 participants observed many variable attachments including onto the serratus anterior muscle, serratus posterior superior muscle, and the ribs, however all participants presented with LSMs bilaterally [8]. Although wide variation of the LSM has been documented, a bilateral congenital absence of the muscle appears to be an extremely rare occurrence without any previous case reports to date. Bilateral absence of the LSMs presents few important clinical implications. First, as the primary action of the LSM is elevation of the scapulae [1], absence of this muscle must be...
reports have been found documenting this occurrence. The LSM is one of the primary elevators of the scapulae and would result in significant shoulder weakness when absent. Physicians should be aware of the possibility of this absence to avoid injury to the underlying nerve and blood supply when treating myofascial pain syndrome and other shoulder conditions.

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REFERENCES