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Case Report

Accessory digastric and mylohyoid muscles – a case report

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Abstract

Dissection of the submental region in a 70-year-old male cadaver revealed two variant muscle bundles. The first variation was a well-defined muscle belly arising from the intermediate tendon of the left digastric muscle and was attached to the right digastric fossa of mandible. This muscle lay in the plane of the main digastric. On a deeper plane, an accessory sheet of muscle fibers was present, arising from the midline raphe of mylohyoid. The fibers from this raphe diverged bilaterally and were attached to the intermediate tendon of the digastric on their respective sides. To our knowledge, the observed combination of variations of these two muscles which, interestingly, have a common embryologic origin has not been reported. An awareness of possible muscle variations in the submental area could be a determining factor in minimizing iatrogenic error and confusion, to the surgeon and the diagnostician.

Key words [submental region] [muscle variation] [digastric] [mylohyoid]

Introduction

The mylohyoid muscle in the floor of the mouth forms part of the oral diaphragm. It also forms the floor of the submental triangle, the sides of which are formed by anterior bellies of the digastric muscles. There are a number of reports which suggest variations of the digastric muscle to be more frequent in comparison to variations of the mylohyoid muscle [1, 2]. The present report describes a rare combination of an accessory anterior belly of digastric and mylohyoid. The anterior bellies of the digastric and the mylohyoid muscles have a common embryological origin, being derived from the first pharyngeal arch [3]. Hence digastric–mylohyoid muscle variations may occur simultaneously [4]. The significance of such variations reinforces the need for awareness of the possibility of variants presenting in the submental region.

Case Report

During the dissection of the head and neck region in department of Anatomy, All India Institute of Medical Sciences, New Delhi, an anatomical variation pertaining to the anterior belly of digastric and the mylohyoid was noted in a 70-year-old male cadaver.

Subsequent to reflection of the platysma, the anterior bellies of the right and the left digastric muscles were exposed. These had a conventional origin from the respective digastric fossae of the mandible. Accessory muscle slips were noted occupying the interval between the free medial borders of the two anterior digastric bellies.

Variation 1

A single well defined muscle belly having a tendinous attachment medial to the attachment of the right anterior digastric belly and confined to the right side of the mandibular symphysis was seen lying parallel to the median line of neck (Figure 1). About 1.5 cm above the superior margin of hyoid, these fibers turned to the left, crossed the midline and continued as a separate fiber bundle along the posterior border of fibers from accessory mylohyoid (variation 2), and finally got attached into the intermediate tendon of the left sided digastric. This unilateral belly was tethered at the midline at its point of change of direction to the underlying mylohyoid raphe. A few fibers from this belly were inserted into the sheet of muscle fibers on the left side of variation 2. The fibers were in the same plane as that of the anterior bellies of digastric muscle.

Variation 2

The second variation noted was the origin of a bilateral sheet of fibers from a midline raphe belonging to the mylohyoid (Figure 1). The fibers on the left exhibited an additional origin from the anterior part of the ipsilateral mylohyoid line, which was deeper to the origin of the left anterior belly of digastric

muscle. The fibers then diverged from the midline bilaterally and posteriorly, opposite in direction to fibers of mylohyoid which were oriented laterally and anteriorly from the midline. These fibers were inserted into the intermediate tendon of main digastric muscle on their respective sides.

As a result of this variation, the floor of the submental triangle which is normally formed by the mylohyoid muscle was reinforced more superficially by the accessory fibers of the digastric muscle as well as by accessory fibers of the mylohyoid muscle. The accessory muscle fibers along with the two anterior bellies of the digastric muscles formed a second diaphragm superficial to the mylohyoid with no direct attachment to the hyoid bone except through the fascial sling.

The nerve to mylohyoid was dissected out on either side and was seen entering the anterior bellies of the respective digastric. The posterior belly of the digastric, the mylohyoid muscle and all other suprahyoid and infrahyoid muscles on both sides presented the usual pattern.

Discussion

Various variations of the digastric muscle have been reported in the literature; however, the reported variations in the mylohyoid muscles are relatively uncommon [1]. The morphology and the plane of attachment with context to variation 1 suggest a unilateral variation of the anterior belly of the digastric muscle. Unilateral variations of the digastric muscle are more common than bilateral ones [4]. The morphology and attachments with context to variation 2 along with a deeper plane in which it lies, suggest that the accessory fibers could be a part of the mylohyoid rather than the digastric muscle. There are three reports of the mylohyoid muscle getting inserted into the intermediate tendon of digastric muscle [5]. We did not come across any report in the literature describing such an anatomical combination of variations as noted in this case report – one unilateral accessory belly of right digastric attaching to the intermediate tendon of the digastric of the contralateral side and the other, bilateral and symmetrical fibers originating from the mylohyoid raphe and the anterior part of left mylohyoid line.

From the developmental point of view, the anterior bellies of digastric and mylohyoid muscles develop from the first pharyngeal arch. Due to their common developmental origin, digastric–mylohyoid muscle variations can be encountered simultaneously [4] and these might pose a difficulty in the apportioning of the unusual muscle fibers to either muscle [2]. The superficial mylohyoid-like fibers may represent an atavism, as it resembles the organization of the mylohyoid in rodents, reptiles and Indian elephants, in superficial and deep layers [4]. The developmental pattern of the muscle tissue of the first arch is a result of interactions between the first arch paraxial mesenchyme, from second and third somitomeres [6] and the surrounding neural crest cells [1, 7] which are derived from rhombomeres 1 and 2 of the hindbrain [8, 9]. Because axial homeobox genes (Hox genes) are expressed in these rhombomeres and the neural crest cells, some unknown aberration of the Hox genes result in abnormality of the neural crest cell differentiation and growth. This, in turn, results in formation of the accessory anterior bellies [1] and as in the present case, of an accessory mylohyoid muscle.

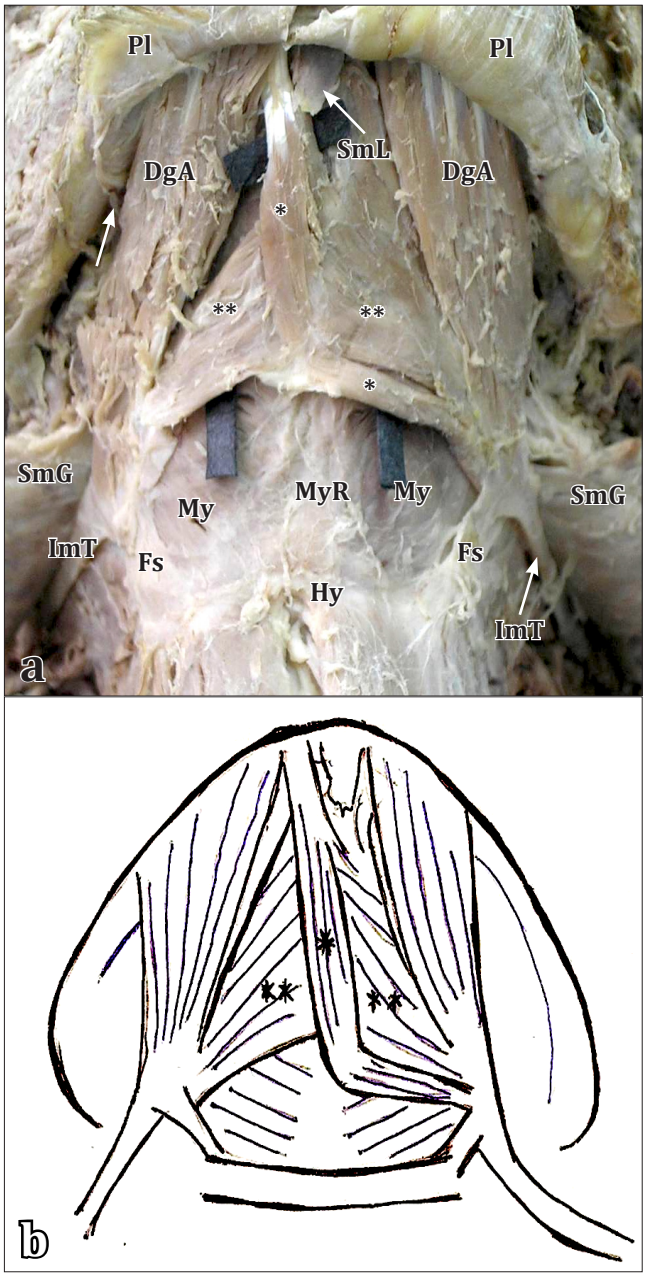

Figure 1. a) Submental region showing a well-defined muscle belly and the sheet of fibers attached to the *mylohyoid raphe (**MyR**)* on a deeper plane. A black sheet of paper has been inserted in a plane between accessory mylohyoid and the normal *mylohyoid muscle (**My**). (*: variation 1; **: variation 2; **Pl**: platysma; **DgA**: anterior belly of digastric; **SmL**: submental lymph node; **SmG**: submandibular salivary gland; **ImT**: intermediate tendon; **Fs**: fascial sling; **Hy**: hyoid bone; **arrow**: nerve to mylohyoid).* **b)** Line diagram substantiating the findings in Figure 1a. *(*: variation 1; **: variation 2)*

Clinical Implications

The variations in the digastric and mylohyoid muscles could pose difficulties, and have important implications with regard to various surgical and diagnostic procedures carried out in the head and neck region. A thorough awareness regarding various possible muscle variations in the head and neck region could help in eliminating confusion during differential diagnosis based on evaluation of CT and MRI, both of which are valuable diagnostic tools [4, 10].

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