

CASE REPORT

Duplicated omohyoid muscle and its clinical significance

RAJALAKSHMI RAI, S. R. NAYAK, ANU V. RANADE,
LATHA V. PRABHU, RAJANIGANDHA VADGAONKAR

*Department of Anatomy, Centre for Basic Sciences,
Kasturba Medical College, Bejai, Mangalore, Karnataka, India*

Abstract

The omohyoid muscle is one of the infrahyoid muscles with superior and inferior bellies. Variations of this muscle are clinically important because of its relation to the internal jugular vein as well as its significance in radical neck dissection. A duplicated omohyoid was observed during routine cadaver dissection, which is attached along with the usual inferior belly of the omohyoid into the transverse scapular ligament. Knowledge of anomalies of this muscle is important to minimize the complications during the surgical procedures of cervical region.

Keywords: infrahyoid muscles, omohyoid muscle, duplication, internal jugular vein.

☞ Introduction

The omohyoid muscle is one of the infrahyoid muscles with superior and inferior bellies. Superior belly divides the anterior triangle and the inferior belly divides the posterior triangle. This muscle is important for radical neck dissection as it is a landmark for this operation [1].

It has been used as a reliable landmark in the supraclavicular region, for endoscopic exploration of the brachial plexus [2]. Unusual origin of omohyoid muscle has been reported in the literature [3, 4].

Tamega OJ *et al.* (1983) described a case where the muscular part of the superior belly of the left omohyoid muscle was absent [5]. Miura M *et al.* (1995) described a double omohyoid muscle [6].

Anderson RJ (1881), Grant JCB (1940), Gardner E *et al.* (1975), Fischer C and Ransmayer G (1989), also described omohyoid variation in their studies [7–10].

☞ Material and methods

During routine dissection of the head and neck region of a 53-years-old male cadaver, we observed a duplicated omohyoid muscle on the right cervical region.

☞ Results

An anomalous muscle was found in the right anterior cervical region of a 53-years-old Indian man. The anomalous muscle arose from the medial half of the transverse scapular ligament as a tendinous band and after 2.1 cm, separated into superior omohyoid muscle (Soh) and inferior omohyoid muscle (Ioh) (Figures 1–3).

The superior omohyoid muscle (Soh) showed normal superior and inferior belly with the intermediate

tendon in between. The inferior omohyoid muscle (Ioh) was seen as a detached part of sternohyoid (Figures 2 and 3). Tendinous intersection was absent in the lower muscle (inferior omohyoid muscle). Both muscles were innervated by *ansa cervicalis*.

☞ Discussions

The two bellies of the omohyoid muscle are united by an intermediate tendon, which is connected to the clavicle by a fascial sling [11]. Because of the direct adhesion of the intermediate tendon to the anterior wall of the internal jugular vein and its connection with it through a thin lamina of the pretracheal layer of the cervical fascia, the contraction of the omohyoid muscle has a direct effect on the lumen of this vessel [12].

Although anomalies of the omohyoid are frequently reported in the medical literature, the duplication of the entire omohyoid from scapula to the hyoid, as in the present case, is very rare. Many muscles of the neck develop from mesenchyma in the branchial arches, but the infrahyoid muscles are formed by the myoblasts from the cervical myotomes [13].

Having a common primordium with the sternohyoid muscle the omohyoid muscle is often a varied shape, with different insertions of the superior and inferior bellies, as well as of varied shape and the situation of the intermediate tendon as related to the internal jugular vein [12].

Loth E (1931) considered the omohyoid muscle to be a remnant of the sternocleido-omohyoid muscle, which really consists of two layers, a sternocleido-hyoid portion and a omohyoid portion and classified the variations of omohyoid muscle into five types [14].

Hatipoglu ES *et al.* (2006) have reported the presence of an unfamiliar muscle cleido-hyoideus on the left side [4].

Anderson RJ (1881) has found duplication of both superior and inferior bellies on the left side of an adult male [7].

Tubbs RS *et al.* (2004), discussed about the right omohyoid originating from the transverse process of C6 and being inserted into the scapula [3].

Some have suggested that omohyoid muscle is concerned with prolonged inspiratory efforts by tensing the cervical fascia and thereby lessening the inward suction of soft tissues that would compress the great vessels and apices of the lungs [15].

The studies by Patra P *et al.* (1988) confirmed that the internal jugular vein is compressed by the omohyoid muscle, and hypothesized that this could lead to modifications in intracerebral venous hemodynamics. These authors suggested that compression of the internal jugular vein by the omohyoid may lead to an antireflux phenomenon, equivalent to venous valves, which may play a roll in cerebral protection during such processes as laughing or forced inspiration [16].

Lang J (1993) has stated that contraction of the infrahyoid muscles, particularly the omohyoid muscles, causes dilatation of the penetrating neck veins and may be responsible for the creation of an air embolus after trauma or surgery to this region by tenting open these vessels [17].

Song J *et al.* (2003) have used the omohyoid muscle for the repair of laryngeal defects [18]. It has been speculated in one case report that bilateral avulsion fractures of the cranial portion of the scapula were caused by powerful contraction of the omohyoid muscles [19].

Miura M *et al.* (1995) described a duplicated superior belly of the omohyoid with one portion inserting into the hyoid bone and one portion fusing into the lateral part of the sternohyoid muscle [6]. They also speculated that this anomaly represented a vestigial muscle derived from the *episternocleidohyoideus sublimis* muscles of lower vertebrates such as reptiles. This primitive sheet of muscle also gives rise to the sternohyoid muscle in man [20].

☞ Conclusions

As omohyoid is a significant landmark in radical neck dissections, knowledge of anomalies of this muscle is important to minimize the complications during the surgical procedures of cervical region.

Corresponding author

Soubhagya Ranjan Nayak, Lecturer, MSc, Department of Anatomy, Centre for Basic Sciences, Kasturba Medical College, Bejai, Mangalore-575004, Karnataka, India; Phone +91 824 2211746, Fax +91 824 2421283, Email: ranjanbhatana@gmail.com

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Figure 1 – Antero-lateral view of the right half of the neck:
 CTO – common tendinous origin of the superior and inferior omohyoid muscles, Ioh – inferior omohyoid, Soh – superior omohyoid, ST – sternothyroid muscle, SS – subscapular muscle, SSN – suprascapular nerve.
 Double down ward arrows indicates the suprascapular ligament

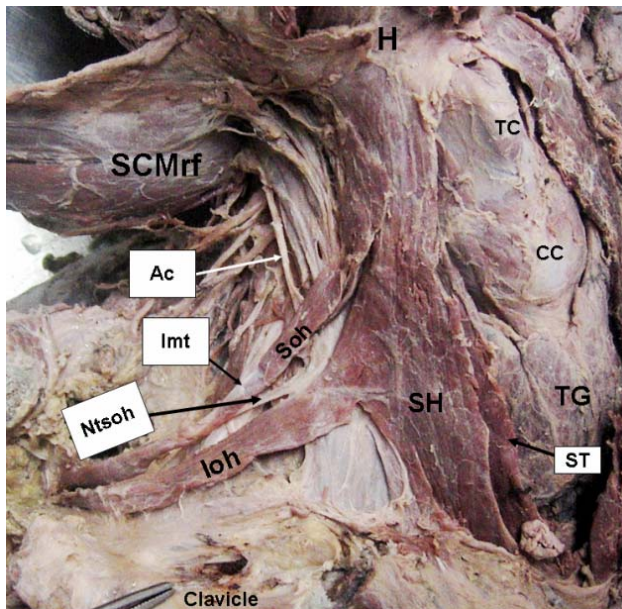
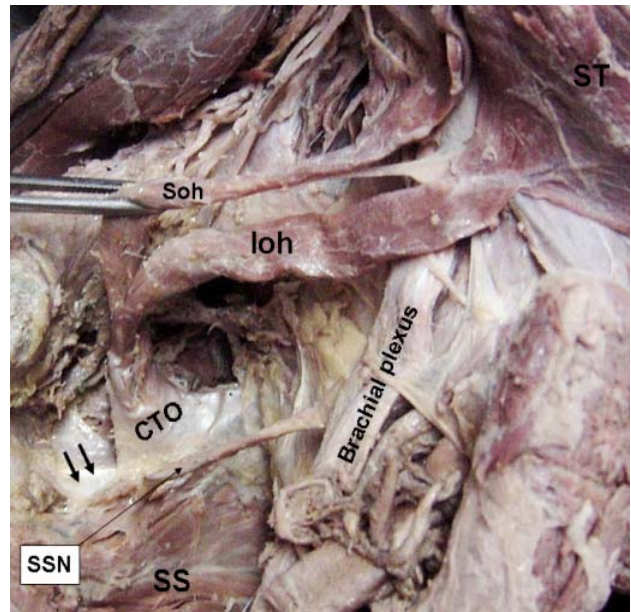


Figure 2 – Antero-lateral view of the right half of the neck after reflecting the sternocleidomastoid muscle:
 H – hyoid bone, TC – thyroid cartilage, CC – cricoid cartilage, TG – thyroid gland, SH – sternohyoid muscle, ST – sternothyroid muscle, Ioh – inferior omohyoid, Soh – superior omohyoid, Ac – ansa cervicalis, Imt – intermediate tendon of the superior omohyoid, Ntsoh – nerve to superior omohyoid, SCMrf – sternocleidomastoid muscle reflected

Figure 3 – Line diagram showing duplicated omohyoid muscle on the right side:
 CTO – common tendinous origin of the superior and inferior omohyoid muscles, Ioh – inferior omohyoid, Soh – superior omohyoid, ST – sternothyroid muscle, H – hyoid bone

