



Double innervations to the superior belly of omohyoid

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ABSTRACT

Awareness in the variations of infrahyoid muscles is useful guide for both in studies of human anatomy and in clinical practice today. The use of muscular flaps as a reconstructive tool requires a thorough anatomical knowledge of its blood supply and innervations. These muscles vary considerably in the extent of their development. The omohyoid is the most frequently absent muscle of this group. We present a rare case of double nerve supply to the superior belly of omohyoid, which was found during our routine anatomical dissection on the right side of the neck of a 55-year-old male cadaver. © IJAV. 2008; 1: 30–31.

Key words [strap muscles] [omohyoid] [ansa cervicalis] [hypoglossal nerve] [variation]

Introduction

The sternohyoid, omohyoid, sternothyroid and thyrohyoid muscles are often referred to as “strap muscles”. They cover the front and much of the sides of the larynx, trachea and thyroid gland and with a deeper-lying suprahyoid muscle, represent a cervical continuation of the muscle mass that, in the abdomen, forms the rectus abdominis.

Omohyoid consists of two bellies united at an angle by the intermediate tendon. The inferior belly is flat, narrow band, which arises from the upper border of the scapula, near the scapular notch and rarely from the superior transverse scapular ligament. It then passes behind sternocleidomastoid and ends there in the intermediate tendon. The superior belly begins at the intermediate tendon, passes almost vertically upwards near the lateral border of sternohyoid and is attached to the lower border of the body of the hyoid bone lateral to the insertion of sternohyoid. The angulated course of the muscle is maintained by a band of deep cervical fascia, attached below to the clavicle and the first rib, which ensheathes the tendon. The superior belly of omohyoid is innervated by branches from the superior ramus (descendens hypoglossi) of the ansa cervicalis (C1). The inferior belly is innervated from the ansa cervicalis itself (C1, 2 and 3). Omohyoid is supplied by the branches from the superior thyroid and lingual arteries. Omohyoid depresses the hyoid bone after it has been elevated.

Case Report

Dissections of the triangles of the neck with a purpose of preparation of the teaching and museum anatomical specimens were performed in the Gross Anatomy Laboratory, in the Department of Anatomy, KMC, Manipal. There were no signs of trauma, surgery or wound scars in the neck region. The skin, superficial fascia and the deep fascia were removed systematically and the muscles, nerves and vessels were cleaned and exposed on both sides of the neck. Special attention was given to the nerves and muscles of the anterior triangle of the neck.

During our routine anatomical dissection on the right side of the neck of a 55-year-old male cadaver, we observed a rare case of double nerve supply to the superior belly of omohyoid. In the same specimen we have also noticed the formation of double ansa cervicalis due to the variation in the course of the C1 fibers. The first branch was arising from the upper loop of the ansa cervicalis and the second branch was coming from the lower loop of the ansa cervicalis (Figure 1). Even though the second branch to the superior belly of omohyoid arose from the lower loop, it appeared to be the continuation of descendens cervicalis (C2, 3 fibers).

Discussion

The infrahyoid muscles are innervated by fibers from upper cervical nerves, which reach them in a somewhat peculiar fashion. The nerves of the lower part of these

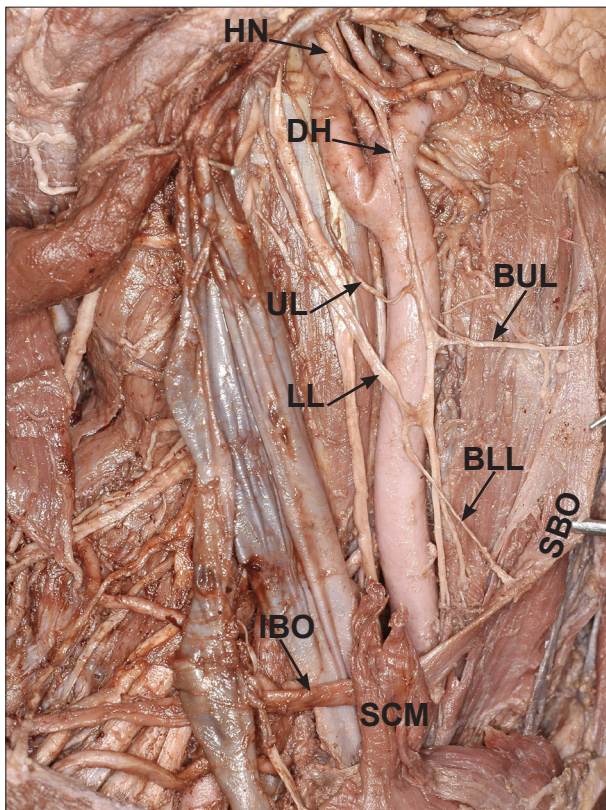


Figure 1. Double nerve supply to the superior belly of omohyoid. (HN: hypoglossal nerve, DH: descendens hypoglossi, UL: upper loop of ansa cervicalis, BUL: branch from the upper loop to the superior belly of omohyoid, SBO: superior belly of omohyoid, LL: lower loop of ansa cervicalis, BLL: branch from the lower loop to the superior belly of omohyoid, SCM: cut end of sternocleidomastoid, IBO: inferior belly of omohyoid)

muscles are given off from a loop, the ansa cervicalis. The inferior root of the loop is a direct branch from the cervical plexus, typically containing fibers from the 2nd and 3rd cervical nerves. It descends either deep or superficial to the internal jugular vein and passes medially to form a loop with the terminal part of the superior root from which branches are given off to the inferior belly of the omohyoid and to the lower parts of the sternohyoid and sternothyroid. The superior root (C1 fibers) of the ansa cervicalis appears to take origin from the hypoglossal nerve, at about the level of the hyoid bone. It descends to join the inferior root to complete the loop. During its course the superior root

sends a branch to the superior belly omohyoid and one to the sternohyoid and sternothyroid muscles close to the level of the thyroid cartilage [1]. A variable amount of skeletal muscle may be present in the fascial band; either belly may be absent or double; the inferior belly may be attached directly to the clavicle and the superior is sometimes fused with sternohyoid. The superior belly of omohyoid is innervated by branches from the superior ramus of the ansa cervicalis (C1). The inferior belly is innervated from the ansa cervicalis (C1, 2 and 3) itself [2].

The double innervations to the superior belly of omohyoid may be because of the formation of double ansa cervicalis, due to the variation in the course of C1 fibres, which has been reported by the same authors [3], or may be due to the developmental background. Each typical myotome part of a somite divides into a dorsal epaxial division and a ventral hypaxial division. Each developing spinal nerve also divides and sends a branch to each division, the dorsal primary ramus supplying the epaxial division and the ventral primary ramus the hypaxial division. Myoblasts from the hypaxial divisions of the cervical myotomes form the scalene, prevertebral, geniohyoid and infrahyoid muscles [4].

Infrahyoid muscles vary considerably in the extent of their development. The omohyoid is the most frequently absent of this group. One belly is absent more frequently than both bellies; the inferior belly may be doubled, with the second belly possibly arising from the coracoid process of the scapula [5].

The omohyoid presented a rare variation in the relation of the superior belly along with the intermediate tendon lying medial instead of lateral to the internal jugular vein and piercing through the carotid sheath [6].

It is possible to preserve the neurovascular integrity in an inferiorly based sternohyoid flap. The superior and medial borders of the muscle are released, with dissection of vascular supply laterally and deep to the muscle, and preservation of the inferior terminal ansa branch [7].

Knowledge of variation in the nerve supply to infrahyoid muscles is very important to surgeons in the preservation of neurovascular supply to strap muscles, used in harvesting the muscle flap for renovating vocal fold or for laryngotracheal reconstruction to prevent the loss of tissue and bulk from ischemia and/or denervation. In addition, knowledge of anatomical variation of superior belly of omohyoid is very essential for surgeons, since it also forms a useful landmark when dissecting the level IV lymph nodes.

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