

# Entrapment of Suprascapular Artery between Split Parts of Right Inferior Belly of Omohyoid Muscle - A Rare Case Report

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## ABSTRACT

Inferior belly of omohyoid is used as a landmark for endoscopic exploration of the brachial plexus. Variation of inferior belly of omohyoid muscle has immense clinical significance because of its relation to brachial plexus, external jugular vein, suprascapular nerve, vessels and phrenic nerve. The need to understand muscular variation is of greater importance because of the increased number of endoscopic surgeries and images for diagnosis. A number of variations of omohyoid muscle such as the absence of muscle, unusual sites of origin and insertion, and multiple bellies have been reported. Doubling or splitting of superior belly of the omohyoid has been reported several times. However, the splitting of the inferior belly of the omohyoid muscle is rarely reported. Herein we report a case of unusual splitting of inferior belly of omohyoid muscle. During the dissection for undergraduate students at AIIMS Bhubaneswar, unusual morphology of inferior belly of omohyoid muscle was observed in formalin embalmed 60-year-old male cadaver. The inferior belly of omohyoid was split. Another important finding observed was suprascapular artery entrapment between the split upper and lower parts of belly of inferior omohyoid with slight indentation mark on the artery suggestive of chronic compression. This muscle is used for various important clinical procedures and is an important landmark for radical neck dissection. So, the knowledge of possible anomalies of omohyoid is important.

**Keywords:** Brachial plexus, Supraclavicular block, Supraclavicular triangle

## CASE REPORT

During the routine dissection for undergraduate students at AIIMS Bhubaneswar, unusual morphology of inferior belly of omohyoid muscle was observed in a formalin embalmed 60-year-old male cadaver.

During dissection of the posterior triangle of neck on right side, splitting in inferior belly of omohyoid muscle was observed. On further dissection and fine cleaning of the surrounding structures the following findings were noted:

On the right side, the inferior belly of omohyoid originated from the medial end of suprascapular notch and after a distance of 1cm, muscle belly split into upper and lower parts [Table/Fig-1]. Then ran upward medially towards lower one-third of sternocleidomastoid muscle and then inserted at intermediate tendon. Between the two parts of inferior belly of omohyoid muscle the tortuous course

of suprascapular artery was noted [Table/Fig-1]. During its further course this tortuous suprascapular artery lied superficial to lower part of inferior belly of omohyoid muscle. Thereafter, it accompanied the suprascapular nerve and ran laterally towards suprascapular notch.

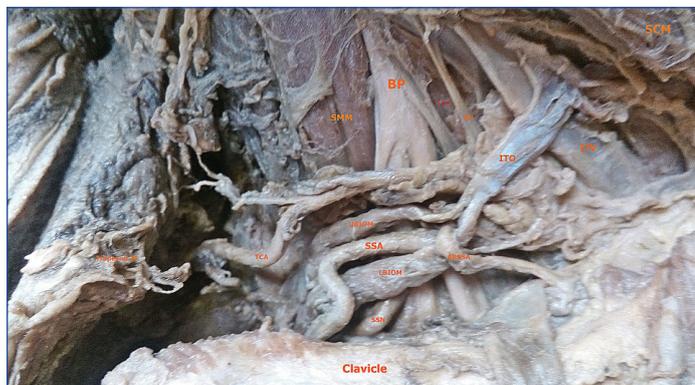
One additional branch arose from suprascapular artery, encircled the lower part of inferior belly of omohyoid muscle and passed downward towards the anterior region of supraclavicular triangle.

While on left side, inferior belly of omohyoid was normal. There was no variation in origin and insertion of superior belly of omohyoid muscle on both sides.

## DISCUSSION

Inferior belly of omohyoid is the key muscle for supraclavicular exploration of brachial plexus and also the best landmark for identifying the internal jugular vein [1]. Normally omohyoid consists of superior and inferior belly, these two unite at an intermediate tendon. Inferior belly arises from the upper border of scapula near the suprascapular notch and sometimes also from superior transverse scapular ligament. This inferior belly arises as a flat and narrow band, which inclines forward, slightly upward and passes behind sternocleidomastoid to end in the intermediate tendon. Superior belly begins at the intermediate tendon, passes vertically upwards near lateral border of sternohyoid and is attached to the lower border of body of the hyoid bone [2]. Omohyoid muscle depresses the hyoid bone after it has been elevated, muscle tenses the deep cervical fascia in prolonged inspiration, and thereby, it reduces the tendency for soft parts to be sucked inside [2]. Numerous variations of omohyoid muscle have been reported, but splitting of inferior belly of omohyoid muscle in this case is a rare finding.

According to Gray's textbook of anatomy, the suprascapular artery a branch of the thyrocervical trunk runs transversely in the posterior triangle of neck. Then the artery first courses laterally, lies superficial



**[Table/Fig-1]:** Right supraclavicular triangle showing ITO-Intermediate Tendon of Omohyoid, PN-Phrenic Nerve, IJV-Internal Jugular Vein, SAM-Scalenus Anterior Muscle, SMM-Scalenus Medius Muscle, UBIOM-Upper Belly of Inferior Omohyoid Muscle, LBIOM-Lower Belly of Inferior Omohyoid Muscle, SSA-suprascapular Artery, ABSSA-Additional Branch of Suprascapular Artery, SSN-Suprascapular Nerve, TCA-Transverse Cervical Artery, BP-Trunk of Brachial Plexus. SCM-Sternocleidomastoid Muscle.

and crosses successively the scalenus anterior muscle and the phrenic nerve, third part of the subclavian artery and the trunks of the brachial plexus. Then, it continues backward and lies inferior to the inferior belly of the omohyoid muscle to reach the superior border of the scapula [2].

Here we present, a rare case report of unusual morphology of inferior belly of omohyoid muscle. We observed the split in right inferior belly of omohyoid with entrapment of suprascapular artery in between. Such variation has never been mentioned in the available literature till date.

Kim DI et al., observed duplicated omohyoid muscle on right side and appearance of the levator glandulae thyroideae muscle on the left side [3]. Rai R et al., reported variations of omohyoid muscles in 35 cadavers. They have mentioned the doubling of superior and inferior belly of omohyoid muscle in 3% of subjects [4].

Tamega OJ et al., reported complete absence of superior belly which was replaced by a broad band tendon [5]. Thangarajan R et al., reported unilateral, left side fibrous band of superior belly of omohyoid in a 65-year-old cadaver [6]. Contracture of unilateral omohyoid muscle or fibrosis of omohyoid may be responsible for torticollis [7,8].

Inferior belly of omohyoid is the key muscle for supraclavicular exploration of brachial plexus [1] and also the best landmark for identifying the internal jugular vein. There is direct adhesion of the intermediate tendon of omohyoid with the internal jugular vein. On contraction of omohyoid muscle, compression of the vein may occur leading to modifications in intracerebral venous haemodynamics during yawning [9].

Developmentally, skeletal muscles are derived from mesenchymal myoblasts which originate in the myotome portion of the dermomyotome. Each myotome divides into a small dorsal epaxial division (epimere) and a larger ventral hypaxial division (hypomere). Myoblasts of cervical hypaxial division myotomes form the scalene, prevertebral, infrahyoid, and geniohyoid muscles [10]. If there is variation in hypaxial division of myotome, then there is a chance of anomalies in infrahyoid group of muscles.

As omohyoid is a degenerative muscle in human beings its variations are common. So, split inferior belly of omohyoid can be used for the repair of laryngeal defects and for the restoration of vocal cord abduction [11].

Normally suprascapular artery, branch of thyrocervical trunk lies superficial to phrenic nerve. In our case, suprascapular artery was lying between the two split parts of inferior belly of omohyoid. So, contraction of this muscle constricts the artery. This may lead to irritation of phrenic nerve which lies deep to the artery causing diaphragmatic paralysis. So, while doing any procedure like supraclavicular block, interscalene block and scalene lymph node biopsy such variation should be kept in mind.

Surgeries in the anterior neck and supraclavicular region, like radical and modified neck dissections to control the lymphogenous spread of head and neck cancer, may require ligation of the suprascapular artery. Thus, knowledge of the entrapment of artery between the two parts of inferior belly of omohyoid muscle is very important [12].

Information of such variation is also important for interpreting MRI images of cervical region as it can be misidentified as pathologies such as cysts, aneurysms, lymphadenopathy, neurofibromas or metastases. Such information is very helpful for the radiologist and surgeons [13].

Suprascapular nerve block is usually given for relief of shoulder pain due to frozen shoulder. Care must be taken while giving the block, as there could be possibility of existing two parts of inferior belly of omohyoid muscle, which contains suprascapular vessels as seen in our case [14].

Nowadays endoscopic surgery is done for omohyoid muscle syndrome, because cosmetically it gives best result. So, if surgeon misses any variation in the bellies of omohyoid muscle, then there can be maximum chances of failure of surgery [15].

## CONCLUSION

Slips of inferior belly of omohyoid muscle with entrapment of suprascapular artery in between it, is a rare variation. Surgeons, anaesthetists and radiologists should be aware of these variations while performing supraclavicular block, interscalene block, suprascapular nerve block, scalene lymph node biopsy, radical and modified neck dissections etc. Widespread knowledge of the variations of the inferior belly of omohyoid muscle and entrapment of suprascapular artery between it, is necessary for avoiding surgical complications.

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FINANCIAL OR OTHER COMPETING INTERESTS: None.

Date of Submission: **Jul 26, 2017**  
Date of Peer Review: **Aug 09, 2017**  
Date of Acceptance: **Sep 18, 2017**  
Date of Publishing: **Nov 01, 2017**