



Neurovascular variations in the carotid triangle

Published online August 29th, 2008 © http://www.ijav.org

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Received July 17th, 2008; accepted August 27th, 2008

ABSTRACT

Anatomical variations in the carotid triangle of the neck may present importance especially during surgical and radiological interventions of the region. We found two variations in the left carotid triangle of an adult female during routine dissection classes. There were two superior laryngeal arteries, one originated from the superior thyroid artery and another abnormal superior laryngeal artery originated directly from the external carotid artery. There was a hole in the internal jugular vein and the accessory nerve passed out through the hole. © IJAV. 2008; 1: 17–18.

Key words [carotid triangle] [superior laryngeal artery] [superior thyroid artery] [external carotid artery] [variation]

Introduction

Normally, the superior laryngeal artery is a branch of superior thyroid artery. It runs horizontally in the carotid triangle along with the internal laryngeal nerve and pierces the thyrohyoid membrane. The artery supplies the lower part of the pharynx and upper part of the larynx.

The internal jugular vein is a large vein that collects most of the blood from the head and neck. It lies in the lateral part of the carotid sheath. It begins as a continuation of the sigmoid sinus at the base of the skull and runs vertically downwards in the neck and joins the subclavian vein to form the brachiocephalic vein.

The spinal part of the accessory nerve is a part of the eleventh cranial nerve. It leaves the cranial cavity by passing through the jugular foramen with the ninth and tenth cranial nerves. It runs downwards and laterally between the internal carotid artery and the internal jugular vein and enters the posterior triangle by piercing the sternocleidomastoid muscle. It runs through the roof of the posterior triangle and enters the trapezius muscle. The spinal accessory nerve supplies sternocleidomastoid and trapezius muscles.

Case Report

During the dissection classes for medical undergraduates, we found two variations in the left carotid triangle of an approximately 50 year-old female cadaver. The variations were unilateral. There were two superior laryngeal arteries. One of them took its origin from the superior thyroid

artery and the other directly from the external carotid artery (Figure 1). Both arteries pierced the thyrohyoid membrane along with the internal laryngeal nerve. The left internal jugular vein had a hole in its upper part and the spinal part of the accessory nerve passed through the hole (Figure 1). The rest of the course and distribution of the accessory nerve was normal. The internal jugular vein also had normal course and tributaries in the lower part of the neck.

Discussion

Variations of superior laryngeal artery are very rare. It might rarely arise from lingual, facial or ascending pharyngeal arteries [1]. Duplication of the superior laryngeal artery has not been reported yet. Superior laryngeal artery arising directly from external carotid artery has been reported [2]. Knowledge of the duplication of the internal laryngeal artery is extremely important in laryngeal surgeries. In such cases both arteries have to be ligated in order to minimize bleeding.

Variations of internal jugular veins have been documented. A case of internal jugular vein fenestration has been reported by Towbin AJ et al., [3]. Duplication of the internal jugular vein is a rare variation. The clinical incidence of the anomaly is approximately 4 per 1,000 unilateral neck dissections [4]. When there is duplication of the internal jugular vein, the accessory nerve passes between the venous duplication. A similar case of the accessory nerve passing between the duplicated internal jugular veins has been reported by Nayak BS [5].

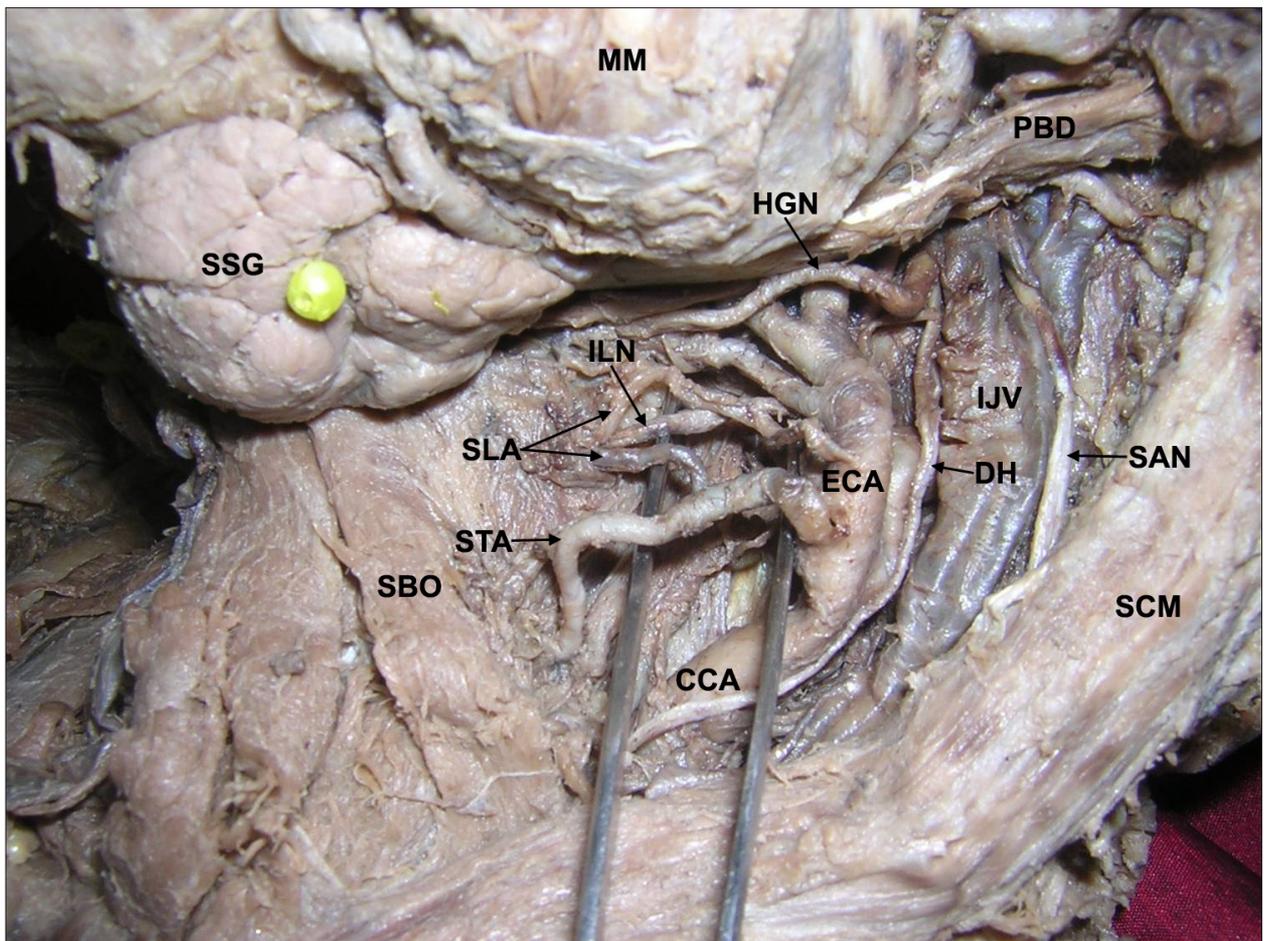


Figure 1. The left carotid triangle showing the variations of the superior laryngeal arteries and the spinal accessory nerve. The veins accompanying the branches of external carotid artery have been removed for better exposure. (*MM*: masseter muscle, *SSG*: submandibular salivary gland, *PBD*: posterior belly of digastric, *SCM*: sternocleidomastoid muscle, *SBO*: superior belly of omohyoid, *CCA*: common carotid artery, *ECA*: external carotid artery, *STA*: superior thyroid artery, *SLA*: superior laryngeal arteries, *IJV*: internal jugular vein, *SAN*: spinal accessory nerve, *ILN*: internal laryngeal nerve, *HGN*: hypoglossal nerve, *DH*: descendens hypoglossi)

The knowledge of fenestration or duplication of the internal jugular vein and its varied relation to the accessory nerve has practical implications during cervical lymph node clearance, either functional or radical; during oncological surgery necessitating viewing the internal jugular vein, its tributaries and accessory nerve. Awareness of this type of a variation is also important in the reconstruction

surgery of the brachial plexus. Nerve transfer procedures are increasingly performed for the repair of brachial plexus injury in which the proximal spinal nerve roots have been avulsed from the spinal cord [6]. The variations reported here may be important for surgeons, neurosurgeons, ENT surgeons and radiologists.

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