Case Report: An Uncommon Variation of the Superior Laryngeal Artery

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ABSTRACT

This case study reports a rare variation of the superior laryngeal artery (SLA), which is the principal arterial supply of the larynx. The knowledge of the arterial variations is essential for the surgeons to prevent blood loss and postoperative complications. During routine dissection of an adult male cadaver, a rare arterial variation in the SLA was seen. In this case, the SLA passed through the thyroid foramen. The present study provides significant information about the SLA. We hope that it helps describe the arterial bleeding that may happen during laryngeal surgery.

1. Introduction

The superior laryngeal artery (SLA) is one of the branches of the superior thyroid artery. SLA is normally accompanies the internal branch of the superior laryngeal nerve, deep to the thyrohyoid muscle, and pierces the thyrohyoid membrane [1, 2]. It is the principal arterial supply of the upper larynx mucosa and laryngeal muscles. SLA also anastomoses with the ipsilateral inferior laryngeal artery and with the branch from the opposite side of the neck [3, 4].

Variations in the branching pattern of the arterial system in the neck region, especially arteries that accompany neural branches, are important in many surgical procedures such as microsurgical revascularization of the larynx, partial laryngectomy, and carotid endarterectomy. In all mentioned opeations, the SLA plays a significant role [5-7]. Variations in the SLA origins is rare.

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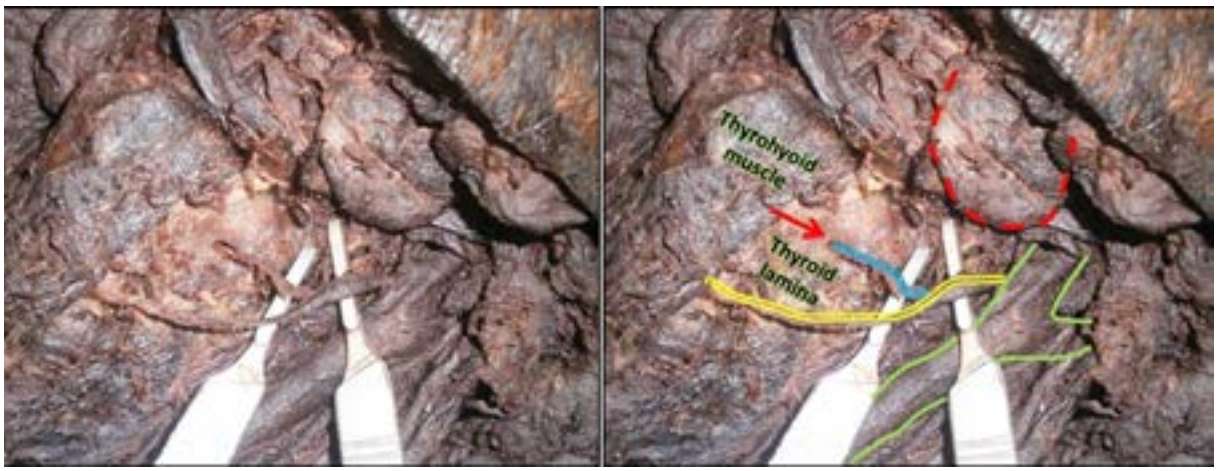

Figure 1. Photographs showing anterolateral view of the dissected neck with thyroid foramen (arrow), SLA (blue), superior thyroid artery (yellow), common carotid artery and its bifurcation (green), and submandibular gland (red) in a male cadaver.

The previous studies have demonstrated that SLA maybe arises from the external carotid, ascending pharyngeal, facial or lingual arteries [8-10]. However, there are few studies related to the variation of entrance of SLA into larynx. The knowledge of the arterial variations of the SLA is essential for the surgeons to prevent blood loss and reduce postoperative complications [11, 12]. Thus, in the present study, we describe a neck region arterial variation in which SLA passes through the thyroid cartilage.

2. Case Report

The human cadaver was in the dissection room, Department of Anatomy, Kerman University of medical science, Iran. During a regular dissection procedure at the dissection hall on a cadaver (male, 40-50 year old), an arterial variation in the neck region was detected. In this case, the SLA passed through the thyroid foramen (Figure 1). It was situated at the superior part of the thyroid lamina and 0.5 cm posterior to the oblique line (with 3 mm diameter).

3. Discussion

The thyroid foramen has been described by Segond, Gruber, Lang et al. and Grosser as being uncommon in occurrence [8, 13-15]. Understanding the accurate surgical anatomy of the SLA and its relationship with other structures is very important in microsurgery procedures of larynx and anterior region of neck [16]. If SLA cannot be found during surgical operation, a variation must be considered. Leon et al. and Tanaka et al. reported that thyroid foramen provides the way for a branch of the external branch of the superior laryngeal nerve [17, 18], but in the present study we observed that the SLA passed through this foramen. According to previous studies, its diameter varies from 1 to 8 mm [14, 19, 20]. In this study the diameter of thyroid foramen was 3 mm. From the perspective of embryology, 2 hypotheses have been proposed to elucidate the origin of the thyroid foramen. The first is the neurovascular theory that is associated with defect of chondrogenesis in the thyroid lamina originated by the presence of the nerves and or vessels [21, 22]. The second is the branchial origin, i.e., thyroid foramen is considered as an imperfect union of the cartilaginous part of the sixth and fourth pharyngeal arches from which the lamina of thyroid cartilage is derived [14, 23, 24]. On the whole, the knowledge of the arterial variations is very important. Furthermore, during surgical operation cautious dissection in the anterior region of the neck and close to the superior pole of the thyroid gland are essential to avoid SLA injury and bleeding.

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Conflict of Interests

The authors of this study declared no conflict of interests.

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