Internal jugular vein anomaly: A lateral branch of the internal jugular vein in the neck

Sidika Deniz Micozkadioglu *, Alper Nabi Erkan

Department of Otorhinolaryngology, Head & Neck Surgery, Baskent University, Ankara, Turkey

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Abstract
There is not any detailed investigation about the jugular vein (JV) anomalies. We can see only case reports in the English literature. Duplication, fenestration are rarely seen anomalies of the internal jugular vein (IJV). The IJV has no lateral branch in the neck. It has only medial branches in the neck. We performed total laryngectomy and bilateral selective neck dissection in a 63-year-old man who has T2N0M0 supraglottic squamous cell carcinoma of the larynx. During the dissection of the right neck we found right IJV ectasia and a lateral branch at the lower level. Lateral branch of the IJV is the second JV anomaly which we met in our cases. It is important to know there can be a anomaly like this during the neck operations.

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1. Introduction

Jugular vein is the largest vein in the neck. It drains intracranial structures and deep structures of the face and neck.1

The IJV is directly continuous with the transverse sinus. It begins in the posterior compartment of the jugular foramen at the base of the skull. Jugular vein runs down the side of the neck in a vertical direction lying at first lateral to the internal carotid artery and than lateral to the common carotid. At the root of the neck JV unites with the subclavian vein to form the innominate vein.2

JV lies on the rectus capitis lateralis behind the internal carotid artery and the nerves passing through the jugular foramen. Lower down the vein and artery lie on the same plane the glossopharyngeal and hypoglossal nerves pass forward between them. The vagus descends between the vein and artery in the same sheath and the accessory nerve run obliquely backward, superficial or deep to the vein.3

The right internal jugular vein is placed at a little distance from the common carotid artery at the root of the neck and crosses the first part of the subclavian artery while the left internal jugular vein usually overlaps the common carotid artery. The left vein is generally smaller than the right. Each pair
contains of valves which are placed about 2 cm above the termination of the vessel.3

2. Case presentation

63-year-old male patient presented to our clinic with the complaints of dyspnea and dysphonia for 1 year duration. Clinical examination revealed vegetative supraglottic laryngeal mass. Larynx biopsy was done and the diagnosis T2N0M0 supraglottic squamous cell carcinoma of the larynx was made.

We performed total laryngectomy and bilateral lateral neck dissection (levels II, III, IV). During the dissection of the right neck we found right jugular vein phlebectasia and at the lower level we found a branch of the right jugular vein which was running to lateral side of the neck (Fig. 1).

His preoperative films are reconstructed to demonstrate the lateral branch of the right jugular vein in detail (Fig. 2).

3. Discussion

For head and neck surgeons, interventional radiologist as well as general clinicians, it is important to know the variations of external, jugular, anterior jugular and facial veins.2 Since IJV is a major landmark in neck surgery IJV variations may cause vessel injuries, incomplete excision of tumor tissue and wrong pathologic diagnosis.3

Anatomical variations of IJVs are clinically significant in cases where venous access is important because anatomical variation may partly account for the inability to cannulate the internal jugular vein in these patients.5 In these cases ultrasonographic examination is useful for finding the position of the IJV and may allow for easy and rapid access.6 Also computed tomography is an excellent method for delineate the anatomy of the IJV and their correlation to the CCA.4

Most commonly seen jugular vein anomalies are duplication and fenestration. Duplication is when two veins bifurcate from internal jugular vein and continue separately to drain into subclavian vein. When we look at the literature there are 12 reported instances of multiple JVs in the literature and majority was observed during the gross anatomy of the neck.

Fenestration is when two veins bifurcate from internal jugular vein but they reunite into a single IJV proximal to the subclavian vein.1

The lateral branch of the accessory nerve always passes medially to the anterior vein and laterally to the posterior vein between the venous duplication. This is most often bilateral. The IJV may be normal dilated or ectatic. The diagnosis of this anatomical variation has practical implications during functional or radical cervical lymph node dissection when necessitating of viewing the IJV and its affluents and the lateral branch of the accessory nerve.6

Up to date, we found that we performed 261 neck dissections. In all these neck dissections this is the second jugular vein anomaly which we met. In our first case which we reported before we had found low partial duplication of right jugular vein.7 In this case we found a branch of jugular vein running to lateral side.

As a result to best of our knowledge this case is the first case of lateral branch of IJV in English literature. Although JV anomalies are rare, surgeons should be aware of in order not to face complications. Keeping in mind the anatomical variations prevent vessel injuries, provide easy and rapid access during interventions, helpful in tumor excision and right diagnosis.

Figure 1 The branch of the right jugular vein at the lower level which was running to lateral side of the neck seen during the dissection of the neck.

Figure 2 The visualization of the lateral branch of the right jugular vein in the reconstructed coronal and axial tomography sections.
References