CASE REPORT

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Forficated jugular in neck dissection - an uncommon case report

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Internal jugular vein is the largest vein channel that's drains the region of head and neck. It's commonly encountered as an important landmark during neck dissection to access level II, III, IV lymph nodes. A sound knowledge about the internal jugular veins is important for head and neck surgeons and to avoid misinterpretation and complications. In this case report we fall upon fortification of internal jugular vein and to purvey some clinical utterance on the importance of this atypical anatomical feature.

CASE REPORT

A 45 year old female patient reported to the department of maxillofacial surgery with non-healing ulcer over the left lateral border of the tongue for the past 3 months. On clinical examination the exophytic ulcer on left lateral border of the tongue measures around 2-3 cm in size with palpable submandibular lymph nodes with absence of neck swelling and phlebectasia and no systemic complications were observed (Figure 1). On further examination and investigation patient was diagnosed with T2 N1 M0 well differentiated squamous cell carcinoma of left lateral border of the tongue (Figure 2). And planned for partial glossectomy with ipsilateral modified radical neck dissection (IJV and accessory nerve saving) on left side of the neck. During cervical lymph node clearance duplication left IJV was identified (Figure 3). The bifuracated IJV begins as a single trunk from the jugular foramen, which later splits caudally into two parts anterior andposterior, after descending an about 3.5cms from the cranial within carotid sheath (Figure 3). Both the parts fuse to form a single trunk in the lower part of the neck just 4 cm before joining the subclavian vein to form a brachiocephalic trunk. The anterior vein was running parallel and drains superior thyroid vein. The Both anterior and posterior trunk of left IJVs are of the same calibre. No structures were observed passing in between the two trunks IJVs. Fortification of IJV is commonly associated with plebectasia but no phlebectasia of IJV was observed. So IJV and Spinal accessory nerve was preserved in our case

DISCUSSION

Internal jugular vein (IJV) is the chief vascular drainage to the head and neck region, The inferior petrosal and sigmoid sinuses combines to form the internal jugular vein, which dawn in the jugular foramen cranially and runs caudally with in carotid sheath just lateral to arteries and uniting with subclavian vein to form brachiocephalic trunk adjoining sternal end of the clavicle (Koichi Watanabe, 2016). Right and left jugular vein rarely equal diameter, the difference is usually due to sinuses of the duramater. The left jugular vein is usually smaller than the right jugular vein.

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The tributary branches of internal jugular veins are as follows, superior bulb which drains the cranial cavity through inferior petrosal sinus. The lingual, facial, pharyngeal, superior, and middle thyroid veins, and sometimes the occipital veins are drains into internal jugular vein (Sicher and Dudrul's, 1996). The medial aspect of the vein is related to the internal and common carotid arteries and vagus nerve. The vagus nerve is commonly found in between the artery and vein. Superficially, the vein is overlaid above and then covered below by the sternocleidomastoid muscle and crossed by the posterior belly of the digastric and superior belly of omohyoid muscles (Hollinshead, 1982; Alaani et al. 2005). The deep cervical lymph nodes of level II, III, IV lie along the vein, mainly on its superficial aspect. It is an important clinical finding that makes neck dissections in posterior triangle easier.

Forficated internal jugular vein is a rare congenital anomaly. The prevalence of this anomaly is 1.0% (3 out of 300 patients), (Alaani et al. 2005). Forficated internal jugular vein commonly associated with phlebectasia, which is a soft tissue swelling of neck due to dilation of venous wall of internal jugular vein, which increases in size during valsalvamaneuver (Alaani et al. 2005). In our case report there is no neck swelling of phlebectasia was observed. There are three theories that put forward to explains the bifurcation of internal jugular vein they are vascular theory, bony theory and neural theory. Neural hypothesis explains on the relation of the XI (spinal Accessory) to the transverse process of the C1 (ATLAS) vertebra during the development the disturbance in relation C1 vertebra and IX cranial nerve leads to duplication. The bony hypothesis states that a variation in the ossification of the bony bridge pattern of the jugular foramen causes the IJV duplication but both the bony and vascular theories were not accepted. Vascular theory is the one accepted theory that explains duplication thought as an result of appearance of secondary venous ring at around the lower border of XI cranial nerve (spinal accessory nerve) during foetal life (Alaani et al. 2005). Persistence of this ring in adult life is an important etiology for bifurcation of internal jugular vein.

Churchman et al., (1915) first reported double IJV during surgical removal of tuberculous gland. Paolo et al., (2009) also reported bifurcation of IJV following neck surgery. Asouhidou et al., (2008) in 186 cadaveric studies compared the dimensions of internal jugular vein

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Figure 1 Patient with carinoma of left lateral border of tongue

Figure 2 Contrast enhanced ct showing the lesion

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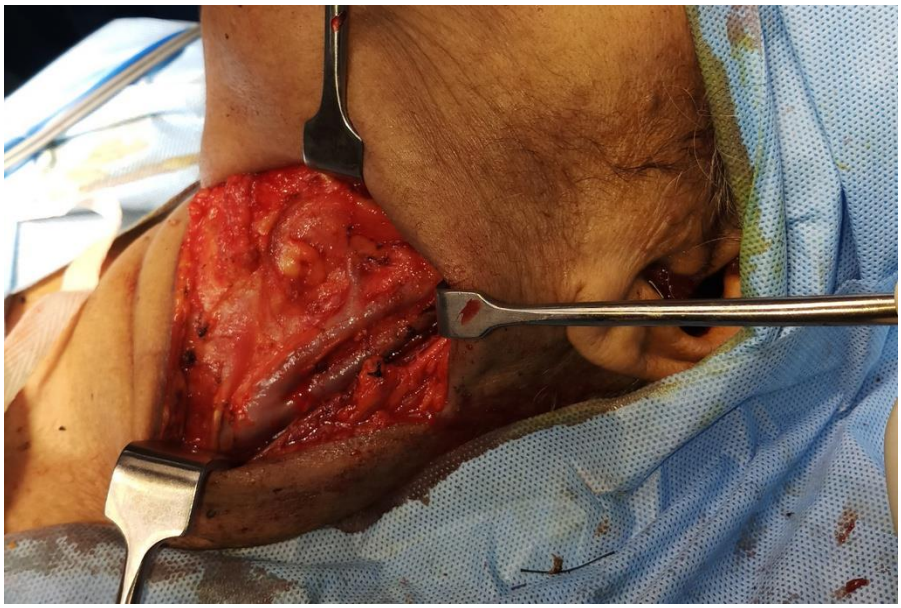

Figure 3 Bifurcated internal jugular vein of left side of the neck

to the external jugular vein and common carotid artery results showed that diameter of internal jugular vein smaller than 6 mm three cases where external jugular vein is larger than normal.

In another study by Shankar & Bhanu (2011), IJV is fenestrated in upper part and united in lower part to form single trunk. Lim et al., (2006) states that, the right IJV is larger than left with reference to common carotid artery, the maximum depth of IJV from 29.9 mm from the skin more than half of IJV are less than1 mm from carotids. Conkbayir et al., (2002) states that color Doppler sonography is essential for detecting collateral pathway.

The jugular veins are an important vital structure in the head and neck, which are commonly used for catheterization and they are ligated during neck dissections (Ali Kemal Gür et al. 2018a; Ali Kemal Gür et al. 2018b; Mohammadreza Sobhiyeh and Najme Bagherhosseini, 2019). Sound knowledge in anatomical variations is necessary to prevent iatrogenic morbidity (Conkbayir et al. 2002). The Unpredictable duplication of the internal jugular vein could affect specific surgical procedures, has the possibility of either iatrogenic morbidity or mortality to the patients. In our case, the greater surface area involved in modified radical neck dissection and ligations done at additional sites that complicates the modified radical neck dissection.

CONCLUSION

Immense knowledge in Head and neck anatomy is essential both clinically and surgically. Recognition In variation of IJV is essential for surgeons and radiologist to prevent misinterpretation of veins during procedures like angiography, hemodialysis and catherization. Head and neck surgeons should have immense knowledge in jugular veins to prevent morbidity. According to the reported medical literature till date and to best of our knowledge this is the first reported case of forficated internal jugular vein incidentally visualized during neck dissection in south Indian population.

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