Aberrant posterolateral tributary to IJV

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Abstract
Veins in the head and neck are known to show considerable variations. These variations could be troublesome while performing surgeries or invasive procedures. This is a report of an aberrant posterolateral tributary to the internal jugular vein. A total of six cases were noted during our routine neck dissections. Documentation of the same is recommended, as the presence of the posterolateral tributary is of great clinical significance to the head and neck surgeons, maxillofacial surgeons, general surgeons, critical care physicians and interventional radiologists in order to avoid an inadvertent injury to the vessel.
Extensive literature search has failed to reveal any case series reporting this additional tributary. Discovery of this additional tributary has great practical implication. Through this manuscript we aim to add to the literature and make the clinicians and the surgeons academically well aware of the rare presence of the posterolateral tributary, which one might encounter during their routine procedures and make them more competent to perform these procedures.

Keywords: Internal jugular vein, Anteromedial tributaries, Posterolateral tributary.

Introduction
Anatomical variations of ijv is well documented and various case reports have been published reporting duplicated, trifurcated and fenestrated internal jugular veins.[1-3] In the current literature, to the best of the authors knowledge ours is the first case series to be documenting the presence of posterolateral tributary to the ijv in six cases and highlighting the clinical significance of this rare tributary .It is strongly recommended to document such rare anatomical variations as it carries great clinical significance to the surgeon, intensivist and radiologist.

Case series
Six patients within the age group of 40 to 60 year reported to the department of surgical oncology, who were diagnosed with stage III-IV squamous cell carcinoma of buccal mucosa. Of the six patients five were male and one was a female.

Operative procedure
In all the cases modified radical neck dissection was performed under general anesthesia and antibiotic coverage. Patient was placed in supine position with neck extended and turned to the opposite side. Surgical painting and draping was done in the routine manner. Modified schobinger incision was marked and skin incision was given using no 15 surgical knife. Flaps were raised in the subplatysmal plane using electro cautery anteriorly upto the midline, posteriorly upto the anterior border of the trapezius muscle, superiorly upto the inferior border of the mandible and inferiorly upto the clavicle. External jugular vein draining into the subclavian vein was ligated. Spinal accessory nerve was identified, skeletonized and preserved. In 3 cases sternomastoid muscle was preserved and the rest of the 3cases the muscle was sacrificed. Dissection began from level V and was carried upto level Ia.

Observations in level V: The tissue clearance began from inferolateral part of level V. As the dissection proceeded laterally to medially, surgeon noticed an aberrant venous tributary running obliquely above the inferior belly of the omohyoid. Since the vein was of significant diameter the surgeon performed blunt dissection and traced the course of the vein. Laterally, the vein entered deep to the anterior border of trapezius muscle. The vein coursed obliquely and terminated into the IJV. The tributary was ligated and rest of the neck dissection was continued in the routine manner.

Fig. 1

Discussion
Veins of the neck show considerable anatomical variations. IJV is the largest vein in the head and neck

area draining the intracranial structures and the superficial face.[4] Classically, IJV receives anteromedial tributaries.[1,5] Rarely does the vein receive posterolateral tributary. Presence of posterolateral tributary causes no trouble to the individual. It is of significance to the surgeon, intensivist and radiologist.

An important anatomical fact concerning to the surgeon is that the vein has no posterior tributaries. Absence of the posterior tributary is beneficial to the surgeon as it makes neck dissection easier and hassel free.[6] The head and neck cancers drain into the lymph nodes that lie along the IJV. Thus IJV is considered as one of the crucial structures in clearance of the neck disease.

Clinical significance for the head and neck surgeon

Neck dissection of level V is a surgical procedure which involves clearing the fibrofatty tissue and the lymph nodes of the posterior triangle. It is a highly skilled procedure that can be performed only by a trained personnel. Injury to any vital structure will lead to serious post operative complications.

IJV is an important landmark in neck dissection guiding the clearance of the lymph nodes. Neck dissection in the posterior triangle can be made easier by clearing the tissue from backwards and moving forwards towards the IJV. The posterior triangle has no tributaries of the IJV. This makes the clearance easy as there is no risk of damage to the IJV and no need of ligations. However, an anatomical variation of the veins is a well-known fact. In rare instances one might come across a posterior tributary of the vein.[7,8] Through knowledge of anatomy and its variations is important to the surgeons to avoid inadvertent damage to the IJV. Injury to the IJV causes bleeding disrupting the surgical field. More than bleeding what one would be more concerned is the risk of air embolism.[9] Thus the operating surgeon must have good anatomical knowledge to avoid such surgical mistakes.

Clinical significance for radiologist

Anatomy of the neck is very complex. During neck dissection the lymph nodes encasing the IJV are cleared. Only clinical assessment would be insufficient to stage the nodal status. Various imaging modalities are used to assess neck disease. Presence of posterolateral tributary might cause interference in interpretation. Despite the ability to identify the anatomical variation of the vein on the ct scan, it was'nt reported in any of the above cases. Also radiologist must have a sound anatomical knowledge in order to report such variations.[8]

Clinical significance for performing invasive procedures

IJV is the largest vein in the neck. The superficial location of the vein and its consistency in location makes it the preferred site for central venous catherization and for monitoring CVP in critically ill patients. Failure to know the presence of posterolateral tributary could pose a trouble while performing invasive procedures and cause inadvertent injury to the major vessels in the neck and terminating the procedure. Repeated attempts ensue severe life threathing complications.[10]

Conclusion

IJV is considered as a key structure in clearing the deep cervical nodes of the neck while performing neck dissections. To the best of authors knowledge, ours is the only case series to be documenting the presence of posterolateral tributary to ijv and highlighting the clinical significance of this unusual anatomical variation. Hence, reporting this article is of clinical and academic interest. Documentation of this unusual branch is strongly recommended, as the tributary is of great clinical significance to the surgeon, the intensivist and to the radiologist.

References

1. Downie. S.A, Schalop.L, Mazurek.J.N, Savitch.G, Lelonek.G.J and Olson.T.R." Bilateral Duplicated Internal Jugular Veins:Case Study and Literature Review". *Clin Anat* 2007;20:260–6.
2. Devi Shankar K, Sharmila Bhanu P. "Variant anatomy of fenestrated internal jugular vein with unusual retromandibular and facial veins". *Int J Anat Variations* 2011;4:144–6.
3. Kapre M, Mangalgiri AS. "Clinical importance of duplication of IJV". *Ind J Otolaryngol Head Neck Surg* 2012;64(4):386-8.
4. Standring S, editor. Gray's anatomy: The anatomical basis of clinical practice. 40th ed. Philadelphia: Elsevier; 2008.
5. B.D.Chaurasia's Human Anatomy Regional and Applied Dissection and clinical vol 3, 4th ed. CBS Publishers & Distributors Pvt Ltd.
6. Ian A Mc Gregor, Frances M Mc Gregor. Cancer of face and mouth. Churchill Livingstone;1986.
7. Sidika Deniz Micozkadioglu, Alper Nabi Erkan. "Internal jugular vein anomaly: A lateral branch of the internal jugular vein in the neck". *Egypt J Ear, Nose, Throat Allied Sci* 2011;12:77–9.
8. Deepak CA, Sarvadnya JJ, Sabitha KS."Variant anatomy of internal jugular vein branching". *Ann Maxillofac Surg* 2015;5(2):284-6.
9. Kerawala CJ, Heliotos M. "Prevention of complications in neck dissection". *Head Neck Oncol* 2009 12;1:35.
10. Denys BG, Uretsky BF. "Anatomical variations of internal jugular vein location: impact on central venous access". *Critical Care Med* 1991;19(12):1516-9.