

A Rare Anatomical Relationship of Spinal Accessory Nerve to Internal Jugular Vein

Amit Dhawan, Prahlad Duggal, Sumeet Sandhu

ABSTRACT

A patient with squamous cell carcinoma of right retromolar area of the mandible and undergoing a staging neck dissection was noted to have a unique relationship of the internal jugular vein and spinal accessory nerve. At the upper end of the dissection (level II, Memorial Sloan-Kettering classification), the spinal accessory nerve was observed to pass directly through the internal jugular vein. Although previously described only once in the literature, this finding may be encountered by other surgeons who operate in this area and it is important that these anatomical variations are borne in mind to prevent inadvertent injury. To our knowledge, this must be the first case reported from India.

Keywords: Spinal accessory nerve, Internal jugular vein, Level II lymph node dissection, Unique relationship.

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INTRODUCTION

Spinal accessory nerve (SAN) innervates the trapezius muscle and the sternocleidomastoid (SCM) muscle in the neck. Denervation of the trapezius muscle often results in shoulder dysfunction and subsequently affects the quality of life of the patient.¹ When oncological clearance is unlikely to be compromised, careful identification and preservation of SAN is important during neck dissection (ND) procedure. Although the SAN is not sacrificed as in modified or selective ND, shoulder complaints are still reported with high incidence. So, the frequency of shoulder dysfunction correlates directly with the extent of SAN dissection.² This associated morbidity with the procedure underlines the importance of knowing the anatomical relationship between SAN and internal jugular vein (IJV) so as to avoid inadvertent injury to SAN. SAN is related variably close to IJV in the upper part of posterior triangle of neck. Precise knowledge of anatomical variations between the SAN and IJV in this region of neck is required during level II lymph node dissection. We describe a patient with oral cancer who was undergoing modified ND when a unique relationship of SAN and IJV was observed. To our knowledge, this must be the second reported case, in the literature, of SAN emerging directly through the IJV.

CASE REPORT

A 50-year-old male patient presented with an exophytic mass involving the right retromolar area. Biopsy reports confirmed moderately differentiated squamous cell carcinoma. After investigations and metastatic work-up, composite resection along with modified neck dissection type II was planned followed by reconstruction with pectoralis major myocutaneous flap. As the dissection approached the superior part of the posterior triangle of the neck near the posterior belly of digastric (PBD) muscle and upper end of IJV (level II), the right SAN was seen coursing directly through the IJV (Fig. 1) which was a rare presentation. The neck dissection was carried out carefully and there was no evidence of SAN dysfunction, postoperatively.

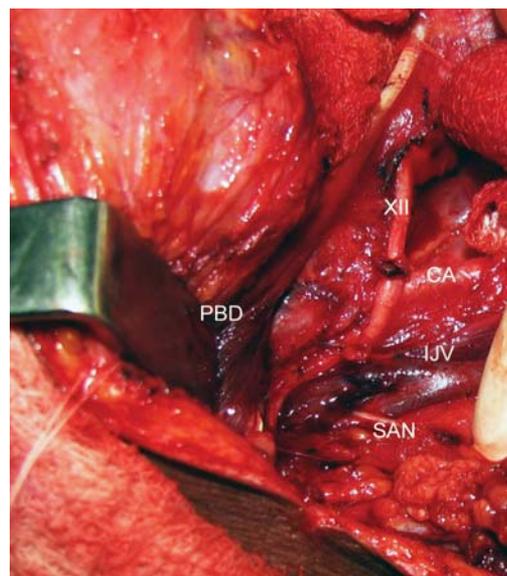


Fig. 1: Intraoperative photograph showing SAN passing directly through the IJV in the superior part of posterior triangle of neck. SAN: Spinal accessory nerve; IJV: Internal jugular vein; PBD: Posterior belly of digastric muscle; CA: Carotid artery; XII: Hypoglossal nerve

DISCUSSION

After the establishment of ND procedures in the management of head and neck cancers, it has become important to know the anatomical relationship between SAN and IJV in the upper part of neck because during almost every ND procedure, it is always mandatory to remove level II lymph nodes for oncological clearance. Iatrogenic injury to the

SAN during ND, especially in this region, may result in significant morbidity in the form of shoulder syndrome which is characterized by pain, restricted movement and drooping of shoulder.^{1,3} Most of the studies deal with anatomical landmarks and their variations to aid identification of SAN by focusing on the landmarks in the posterior triangle of the neck. Most describe preservation of SAN through its identification in the lower neck, near its entry at the anterior border of the trapezius muscle.⁵ A lesser number of studies are available in literature describing the courses of SAN in relation to its surrounding structures in the upper neck region.^{3,4,8}

Different authors have reported variable relations of SAN with IJV in upper neck and most of these studies report a higher incidence of lateral relation of SAN to IJV compared with a medial relation.^{3-5,7-9} There is a lot of variation in the incidence of lateral and medial relation in different studies with some reporting a very low percentage of medial relation.³ Also there is variability in the results of cadaveric studies and those on live ND.^{3,4,10} The concept of SAN that rarely deviates from the lateral position relative to the IJV is an important one and is more predictable pattern.³ But the data of SAN emerging directly through the IJV is lacking owing to its rare occurrence.^{6,7}

A variable relation of SAN with IJV makes it prone to injury during level II neck dissection with resultant morbidity. The morbidity associated with the dysfunction of SAN is substantial and directly affects the postoperative quality of life of the patient.

One must, therefore, be aware and has knowledge of these anatomical variations and should perform meticulous dissection to minimize the risk of injuring the SAN and IJV.

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