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CASE REPORT

Vagal Nerve Schwannoma: Presentation of Two Case Reports

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ABSTRACT

Vagal nerve schwannomas are rare neural sheath tumors. Although schwannomas are generally benign lesions, they are known to enlarge at a rate of 2.5 to 3 mm per year according to published reports. Vagal nerve schwannoma usually occurs between the 3rd and 5th decades of life, it does not show sex predilection, with both sexes being equally affected, and it most often presents as a painless, slow-growing, lateral neck mass. The treatment of choice is complete surgical excision with preservation of the neural pathway, when it is possible. These tumors, in fact, are almost always benign, and a conservative surgical approach is emphasized by most of the authors. Here, we are presenting two cases of cervical vagal schwannoma, both were middle aged females and presenting in the ear, nose, and throat (ENT) department as a painless lateral neck swelling and were operated by horizontal skin crease incision. Of the two cases, we succeeded to secure nerve functions in one case. The clinical features, diagnosis, management, and pathological findings of cervical vagal schwannoma are discussed.

Keywords: Benign tumor, Schwannoma, Vagus nerve.

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INTRODUCTION

Vagal nerve schwannomas are rare neural sheath tumors. Although schwannomas are generally benign lesions, they are known to enlarge at a rate of 2.5 to 3 mm per year according to published reports.[1,2] The most common presenting symptoms are hoarseness, dyspnea, dysphagia, cough, aspiration, tongue weakness, and vocal cord paralysis. However, it is not uncommon for this tumor to present as an enlarging asymptomatic neck mass.

The treatment options of vagal nerve schwannomas are wide ranging. Asymptomatic tumors can be observed closely due to their benign nature and indolent course. Surgical resection is the standard of care for symptomatic schwannomas, and there are differing opinions on what surgical procedure should be performed. Some authors believe that the close adherence of the vagus nerve to the tumor capsule renders preservation of the nerve impossible[3] and thus advocate complete excision with nerve transaction. This is often performed in conjunction with immediate reanastomosis and/or vocal cord medialization. Other authors claim that careful dissection can separate these tumors from their associated nerves[4] and favor nerve-sparing techniques including enucleation, extracapsular removal, and shelling out the majority of the tumor while leaving gross disease behind. A literature review performed by Valentino et al[3] shows that these procedures increased the chances of nerve preservation ranging in success based on the procedure performed. The technique of enucleation of vagal nerve tumors has been described by several authors with moderately good results.[5,6] A series of five cases described by De Araujo et al using the enucleation technique showed a 60% success rate in preserving nerve function postoperatively.

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CASE REPORTS

Case 1

A 43-year-old female presented with a palpable lump in the left side of the neck, which was slowly growing and associated with change in voice and paroxysmal cough. Physical examination revealed a soft, smooth-surfaced mass in the left lower cervical region, measuring 6 × 3 cm. Upon palpating the mass, a paroxysmal cough was elicited. Indirect laryngoscopic examination showed left vocal cord palsy.

Ultrasound of the neck showed a hypoechoic nodule in the left side of the neck, 3 cm in diameter. A color Doppler scan showed a flow signal in the peripheral position. Computed tomography (CT) scan of the neck with contrast demonstrated a well-circumscribed mass, with high and inhomogeneous signal intensity, on the left side of the neck, between the internal jugular vein and the carotid artery. The patient, therefore, underwent surgery. Under general anesthesia, a cervical skin crease incision was made and the dissection proceeded beneath the muscle. A yellowish-white, ovoid-shaped mass was

observed, measuring ~7 × 4 cm lying between the carotid artery and the internal jugular vein. Both the superior and inferior ends of the mass appeared in continuity with the vagus nerve. Since an adequate dissecting plane could not be reached, it was impossible to dissect the splayed nerve trunk off the tumor. The tumor was completely resected *en bloc* (Figs 1 and 2). The specimen sent for histopathological examination and pathological examination confirmed the diagnosis of benign schwannoma of the vagus nerve. Microscopically, the neoplasia was composed of spindle cells organized in small fascicles, mainly in an edematous background.

Postoperatively, the hoarseness became more severe and examination of the larynx showed paralysis of the right vocal cord.

At follow-up, 1 year after surgery, the patient was well, without evidence of disease. Vocal cord palsy was still present.

Figure 1 shows mass separated from carotid space and Figure 2 shows size of mass after excision.

Case 2

A 32-year-old female presented with a palpable lump in the left side of the neck, which was asymptomatic and slowly growing. Physical examination revealed a soft, smooth-surfaced mass in the left lower cervical region, measuring 4 × 4 cm. Carotid artery pulsations were felt subcutaneously at the anterior border of the sternocleidomastoid muscle, beneath the carotid pulsation mass of 4 × 4 cm that was palpable. Indirect laryngoscopic examination revealed normal findings, and both vocal cord movements were normal. Upon palpating the mass, there was no evidence of paroxysmal cough.

Figure 3 shows the schwannoma pushing the carotid anteriorly and the anterior border of sternocleidomastoid muscle, and Figure 4 shows whole mass separated from carotid and vagus nerve.

Ultrasound of the neck showed a hypoechoic nodule in the left side of the neck, 4 cm in diameter. A color Doppler scan showed a flow signal in the peripheral

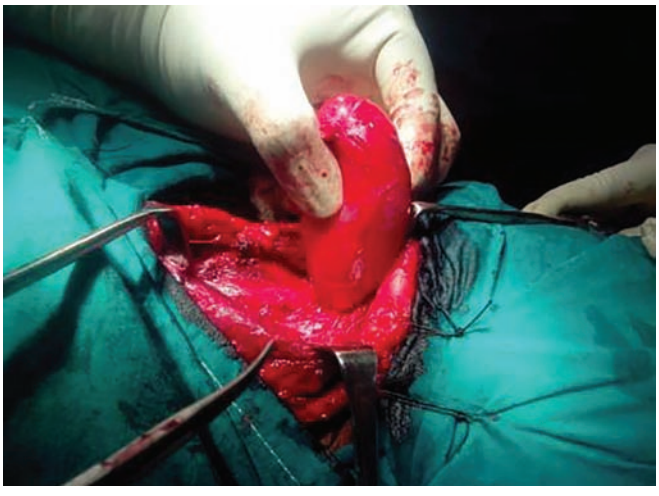

Fig. 1: Intraoperative photograph of mass lifted from carotid sheath

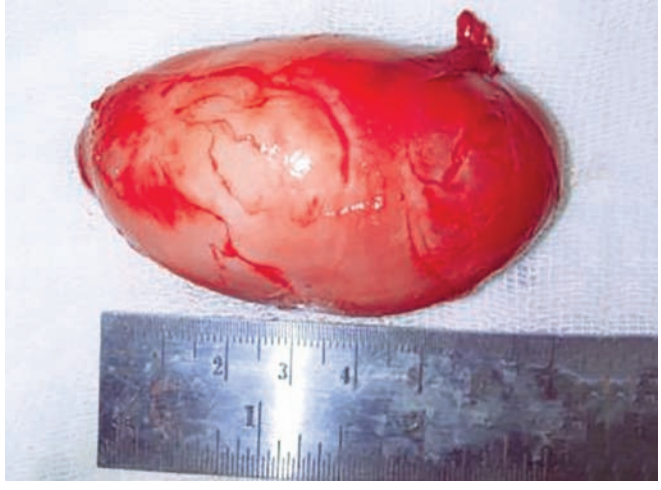

Fig. 2: Excised mass of size 7 × 4 cm

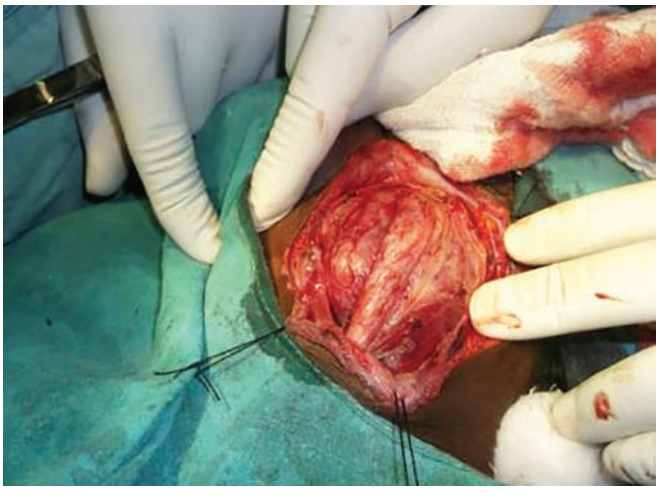

Fig. 3: Anteromedial aspect of mass and carotid artery at anterior border of sternocleidomastoid muscle

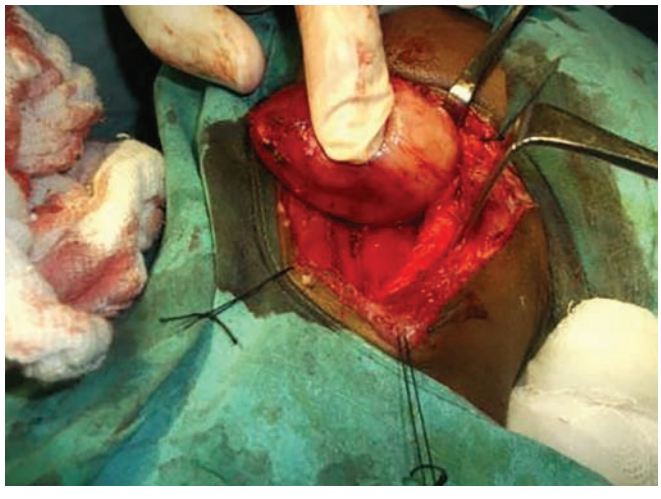

Fig. 4: Mass separated from carotid and vagus nerve

position. Computed tomography scan of the neck with contrast demonstrated a well-circumscribed mass, with high signal intensity on the left side of the neck, between the internal jugular vein and the carotid artery, mass pushing the carotid anteromedially. The patient, therefore, underwent surgery. Under general anesthesia, a cervical skin crease incision was made and the dissection proceeded by keeping in mind the abnormal course of carotid artery. A yellowish-white, ovoid-shaped mass was observed, measuring ~4 × 4 cm lying just beneath the carotid artery and displacing the internal jugular vein posterolaterally. The carotid artery separated meticulously from the underlying mass. Both the superior and inferior ends of the mass appeared in continuity with the vagus nerve. Here, we have taken the use of operating microscope for separating the mass from nerve sheath and we have dissected the nerve trunk off the tumor. The tumor was completely resected *en bloc* by keeping the nerve trunk intact. The pathological examination confirmed the diagnosis of benign schwannoma of the vagus nerve. Microscopically, the neoplasia was composed of spindle cells organized in small fascicles, mainly in an edematous background.

Postoperatively, the patient was comfortable and examination of the larynx showed bilateral vocal cord normal movement.

DISCUSSION

Vagal nerve schwannomas present a challenging problem for head and neck surgeons. Multiple treatment options exist including observation, complete tumor excision with nerve transaction, and excision with nerve preservation. Given the neurological sequelae associated with vagal nerve transaction, nerve-sparing techniques should be performed whenever feasible. The intimate relationship between the vagus nerve fibers and tumor capsule requires meticulous subcapsular dissection to optimize the chances of preserving nerve function. The benefit of microsurgical nerve-sparing dissection of vagal nerve schwannomas has been demonstrated. Torossian et al reviewed postoperative neurological outcomes in 15 head and neck schwannomas undergoing enucleation with nerve preservation. Only two tumors recurred, and these recurrences were attributed to the lack of microscopic dissection.[7] However, despite the use of microsurgical techniques, there are still a number of cases in the literature of failure to preserve nerve viability.[1] In this article, we introduce the use of operating microscope for dissection of vagal nerve schwannomas. We have found that the ability to identify vagal nerve fibers using operating microscope results in a more precise subcapsular dissection. This relatively noninvasive technique did not add significant time to the operative procedure and resulted in an excellent postoperative outcome.

CONCLUSION

The purpose of this report is to present our technique for enucleation of vagal nerve schwannomas with nerve preservation. In conjunction with meticulous microsurgical dissection, operating microscope allows for successful preservation of the vagus nerve and decreased postoperative morbidity.

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