Trauma Induced Schwannoma of the Recurrent Laryngeal Nerve after Thyroidectomy

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Introduction:
Schwannomas are benign tumors arising from perineural Schwann cells that are typically slow-growing and have the highest prevalence among patients in their fifth to sixth decades. Most schwannomas are sporadic and arise from sensory nerves, and motor nerve involvement is rare. Though the majority of schwannomas are idiopathic, some have suggested that trauma may play a role in the development of schwannomas, as Wilkinson et al. have described the case of a schwannoma preceded by a traumatic vertebral fracture. Association with certain syndromes, such as neurofibromatosis type 2 and schwannomatosis can also be found in certain cases. Diagnosis of schwannomas is centered on biopsy, as certain pathologic features are characteristic of schwannomas. Alternating patterns of spindle cell and areas of less dense cells—referred to as Antoni A and B areas, respectively—are the pathologic hallmark of schwannomas. S-100 positivity on histopathologic staining is indicative of Schwann cell origin and can be instructive in diagnosis. Imaging is also helpful in the diagnosis of schwannomas, and MRI is the preferred imaging modality. Typically, MRI imaging reveals T1 isos- to hypointensity and T2 hyperintensity. STIR sequences can be used to differentiate schwannomas from lipomas, as lipomas will not enhance in this sequence.

Case Report:
A 68 year old female presented to our clinic with persistent hoarseness, dysphagia, and a left supraglottic mass. She had undergone a left completion hemithyroidectomy 4 years prior. Immediately after her hemithyroidectomy, the patient experienced hoarseness, dysphagia, and a left vocal cord paralysis secondary to a recurrent laryngeal nerve injury. After undergoing two injection thyroplasties and a medialization thyroplasty, she presented to our clinic for persistent hoarseness.

A soft tissue mass within the left false vocal cord, laryngeal vestibule and true vocal fold was subsequently noted on direct laryngoscopy and biopsied. MRI revealed a 2.4 x 1.4 x 1.6 cm T1-hypointense, STIR-positive, well-defined, ovoid enhancing mass centered within the left true vocal cord and extending superiorly to left false vocal cord (Figure 1). Pathology was read as a traumatic laryngeal schwannoma and the surgical specimen was S-100 positive. Subsequently, the patient underwent an endoscopic partial supraglottic laryngectomy, but the lesion recurred after surgery. As such, definitive resection with a vertical partial hemilaryngectomy was performed. Dissection of the patient’s schwannoma revealed it was pedicled off of the recurrent laryngeal nerve as it passed superiorly, distal to the cricothyroid joint (Figure 2).

Discussion:
Though 25 to 45% of schwannomas arise in the head and neck region, laryngeal schwannomas are extremely uncommon, representing approximately 0.1% of benign laryngeal neoplasms. Most laryngeal schwannomas affect the superior laryngeal nerve and schwannomas of the recurrent laryngeal nerve are exceedingly rare, with only one reported in the English literature. In the reported case, the patient was found to have an incidental schwanna during a parathyroidectomy, which was excised with subsequent unilateral vocal cord paralysis.

This case represents the first case report of a trauma-induced schwannoma of the recurrent laryngeal nerve. We hypothesize that the injury to the left recurrent laryngeal nerve during the patient’s left completion hemithyroidectomy resulted in the development of the schwannoma. This case is not only the second case of a recurrent laryngeal nerve schwannoma in the English literature, but also adds to the understanding of the pathophysiology of schwannoma development as few cases of trauma-induced schwannomas exist in the literature.

Treatment of laryngeal schwannomas centers on surgical excision, and some have reported restoration of nerve function after resection. A better understanding of schwannoma development, especially in the recurrent laryngeal nerve, may add to the clinical care of patients with this rare disorder.

References:

Figure 1. Axial MRI images demonstrating a mass in the region of the left true vocal cord with extension to the false cord. Magnetic resonance imaging demonstrates hypointensity on (A) T1, (B) enhancement after administration of gadolinium on T1, and (C) STIR positivity. T2 weighted image with areas of hyperintensity and hypointensity in true vocal cord mass

Image 1. Intraoperative image of schwanna pedicled to left recurrent laryngeal nerve.