Unusual Presentations and Postoperative Outcomes of Vagal Nerve Lesions A Case Series

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INTRODUCTION

- Vagus nerve tumors are rare entities that typically present as slowly developing lateral neck masses that are often clinically silent.
- Vagal nerve paragangliomas account for about 5% of all head and neck paragangliomas. These tumors may cause cranial nerve palsies including hoarseness and pulsatile tinnitus. Functional parasympathetic paragangliomas account for only about 2% of observed cases.
- Vagal schwannomas account for about 2-5% of neurogenic tumors. These tumors also typically present insidiously, sometimes discovered incidentally on imaging studies. However, patients may present with peripheral nerve deficits.
- The standard of care for such tumors involves observation when they remain asymptomatic and have no evidence of growth. Considerations for surgical intervention include age, symptoms, and growth rate.

METHODS

- Retrospective case series and presentation of initial and postoperative symptoms following surgical management of vagal nerve pathology.

CASES PRESENTATIONS AND IMAGING

PATIENT	PATHOLOGY	PRESENTING SYMPTOMS	SURGERY PERFORMED	NERVE SACRIFICE	SYMPTOM RESOLUTION
1	Left vagal schwannoma	Enlarging neck mass	Tumor enucleation	No	No
2	Right vagal paraganglioma	Cough	Ligation of arterial vessels to lesion	No	Yes
3	Right vagal schwannoma	Syncope	Tumor enucleation	No	Yes
4	Left vagal paraganglioma	Cough	Tumor enucleation	Yes	Yes

PATIENT 1

- 74 year old female presented with a rapidly growing left sided neck mass, previously diagnosed as a stable schwannoma.
- Treatment: Tumor enucleation with preservation of vagus nerve and confirmed function with neuromonitoring
- Pathology: Schwannoma
- Postoperatively: Good bilateral vocal cord function but reported persistent dry cough that escalated to an unremitting neurogenic cough treated with Gabapentin and Nortriptyline. The cough remains intractable two years out.

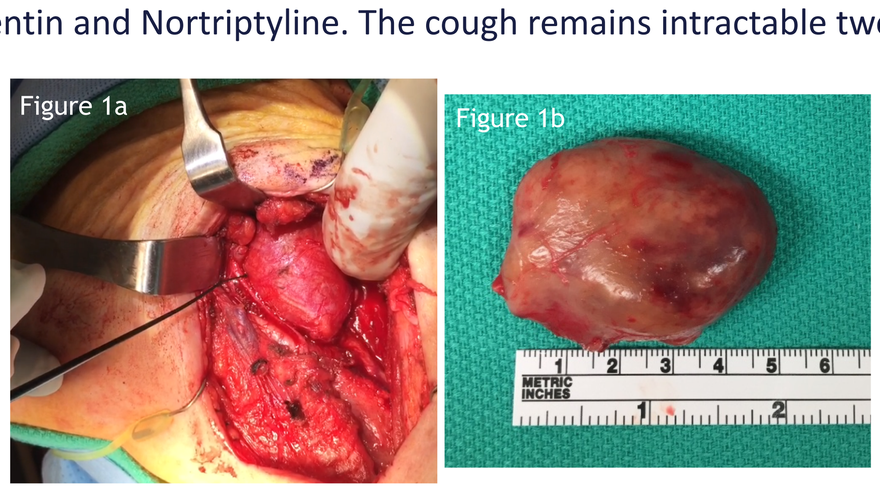

Figure 1a: Intraoperative neurostimulation of vagus nerve. Figure 1b: Vagal schwannoma measuring 5.5 x 3.5 x 2.4 cm.

PATIENT 2

- 47 year old female with known vagal paraganglioma presented with chronic neurogenic cough that failed medical treatment. Tumor was stable over years and preoperative vocal cord function intact.
- Treatment: Ligation of arterial supply to the lesion without resection
- Pathology: Paraganglioma
- Postoperatively: Cords remained intact and patient's cough resolved with stable mass.

PATIENT 3

- 44 year old female presented with a lower vagal schwannoma with associated syncope and other reported various vague symptoms, such as intermittent heart racing.
- Treatment: Tumor enucleation with preservation of vagus nerve
- Pathology: Schwannoma
- Postoperatively: Preservation of vagal nerve function, good vocal fold function and resolution of syncope and heart racing.

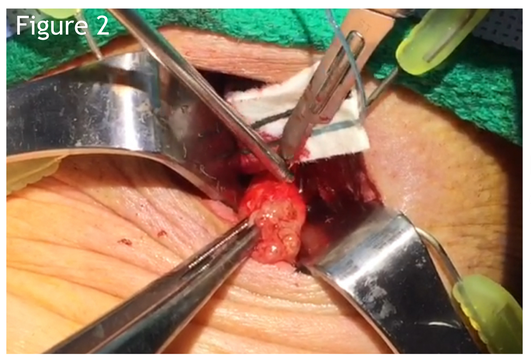

Figure 2: Right vagal schwannoma enucleation.

PATIENT 4

- 66 year old female presented with known vagal paraganglioma causing progressively worsening vocal cord paralysis, intractable cough, and dysphagia.
- Treatment: Resection of lesion, with sacrifice of the left vagal nerve and preservation of hypoglossal nerve
- Pathology: Paraganglioma
- Postoperatively: Resolution of cough. Cord was paretic preoperatively, and patient had compensated enough so as to notice little change in voice postoperatively.

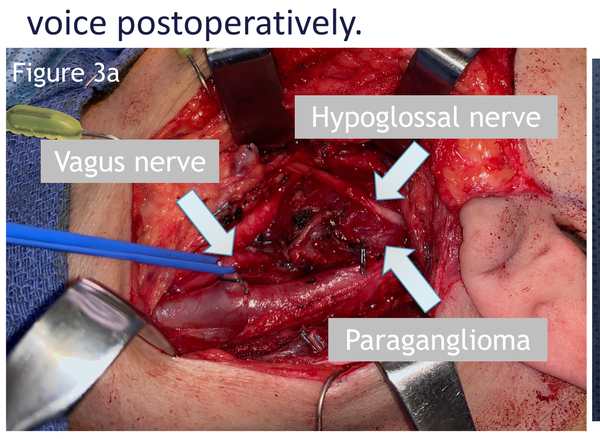

Figure 3a: Cervical approach for resection of left vagal nerve paraganglioma. Figure 3b: Resected lesion measuring 4.4 x 3.5 x 1.9 cm.

DISCUSSION

- Based on 3 of our cases dealing with cough, we note that the vagus nerve, if irritated, can result in intractable cough.
- In one case, the intractable cough was initiated by enucleating the tumor, but leaving the nerve intact may cause irritation.
- In another scenario, the patient had a cough and a stable paraganglioma with extensive blood vessels surrounding the lesion, which resolved when these vessels were isolated and ligated.
- In a third case the patient presented again with a rapidly growing paraganglioma with intractable cough which resolved after resection of the tumor and sacrifice of the vagus nerve.
- These examples leave us to speculate that management of the vagal nerve in such cases can have direct impact on patient symptoms.

CONCLUSIONS

- We present 4 cases of patients without cranial neuropathies, but irritation of the vagus nerve causing symptoms.
- We conclude that in counseling patients with vagal nerve pathology, consideration for reducing or resolving these symptoms needs to be addressed with the patient.

REFERENCES

Heyes R, Taki N, O'Leary MA. Vagal Paraganglioma Presenting as a Neck Mass Associated with Cough on Palpation. Case Rep. Otolaryngol. 2017;2017:7603814.
Langerman A, Athavale SM, Rangarajan SV, et al. Natural history of cervical paragangliomas: outcomes of observation of 43 patients. Arch. Otolaryngol. Head Neck Surg. 2012;138:341–345.

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