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Case Series

Ear, Nose and Throat Section

Silent Growth: A Case Series on the Intriguing Journey of Sinonasal Schwannomas

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ABSTRACT

Sinonasal schwannomas are rare benign tumours arising from Schwann cells, comprising less than 4% of all head and neck schwannomas. Their clinical presentation is often non specific, leading to frequent misdiagnosis. The authors present three cases of sinonasal schwannomas to illustrate the diagnostic and therapeutic challenges associated with these tumours. The patients, including two adult females and one adolescent male, presented with unilateral or bilateral nasal obstruction and associated symptoms such as nasal discharge, epistaxis and snoring. Imaging using Computed Tomography (CT) or Magnetic Resonance Imaging (MRI) revealed well-defined, enhancing soft-tissue masses confined to the nasal cavity and paranasal sinuses, without evidence of orbital or intracranial extension. Provisional diagnoses included juvenile nasopharyngeal angiofibroma and antrochoanal polyp. All patients underwent complete tumour excision via a transnasal endoscopic approach. Histopathological examination {Haematoxylin & Eosin (H&E)} confirmed the diagnosis of schwannoma in all cases, demonstrating the characteristic biphasic Antoni A and Antoni B patterns with Verocay bodies. One case was diagnosed as an ancient schwannoma. There were no significant intraoperative or postoperative complications and no recurrences were observed during follow-up periods ranging from 6 to 12 months. These cases underscore the importance of considering schwannoma in the differential diagnosis of unilateral nasal masses. While imaging aids in assessing the extent of the lesion, definitive diagnosis relies on histopathological examination. Endoscopic surgical excision is a safe and effective treatment option, offering excellent outcomes with minimal morbidity.

Keywords: Antrochoanal polyp, Nasal masses, Transnasal endoscopic approach, Verocay bodies

INTRODUCTION

Schwannomas are rare, slow-growing, benign tumours arising from Schwann cells of the nerve sheath. While extracranial schwannomas account for 25-45% of all schwannomas in the head and neck region, only about 4% involve the nasal cavity and paranasal sinuses [1]. Their non specific imaging features often lead to misdiagnosis as other nasal tumours. Diagnosis depends on histological analysis and immunohistochemistry, while complete surgical excision remains the treatment of choice.

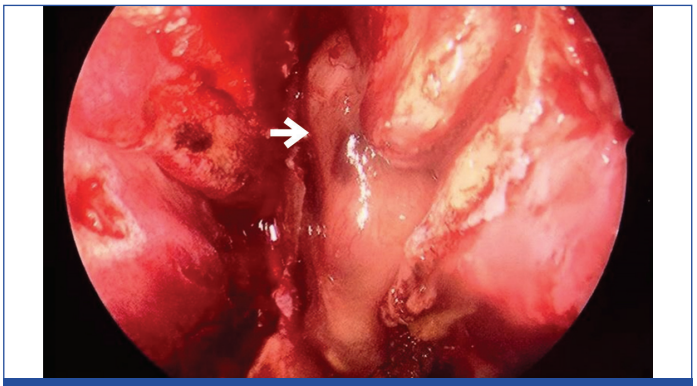
Case 1

A 14-year-old male presented with progressive bilateral nasal obstruction for one year. He also complained of nasal bleeding, occurring three to four times over the past year, each episode involving a few drops of blood and resolving spontaneously. The patient also reported nasal discharge for one year, which was mucoid in nature, scanty in amount, occasionally blood-stained and non foul smelling. He had a history of mouth breathing for the past six months. There was no history of ear blockage or ear discharge.

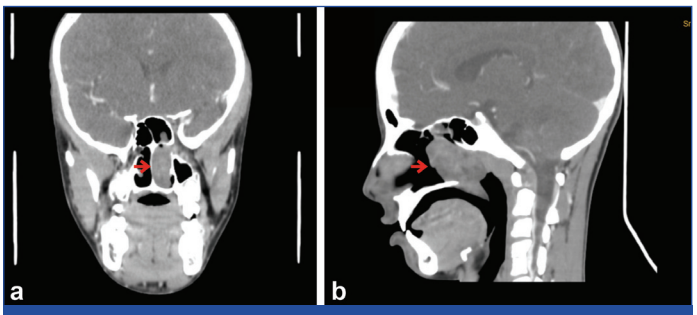
Diagnostic nasal endoscopy revealed a pinkish, smooth mass in the left nasal cavity, abutting the posterior ends of the inferior and middle turbinates and extending into the nasopharynx [Table/Fig-1].

Contrast-enhanced CT revealed a lobulated, intensely enhancing soft-tissue density lesion measuring 4.8×2.4×3.4 cm in the left nasal cavity, likely arising from the widened left sphenopalatine foramen. A few arterial feeders arising from the external carotid artery were noted. No bony erosions were observed [Table/Fig-2].

A differential diagnosis of juvenile nasopharyngeal angiofibroma and sinonasal schwannoma was considered. Following arterial embolisation 24 hours prior to surgery, the patient underwent transnasal endoscopic excision of the mass. Intraoperatively, the tumour was found to be attached to the posterior nasal nerve just below the sphenopalatine foramen. The mass was carefully delineated using a coblator and was completely excised. There were no significant intraoperative or postoperative complications.



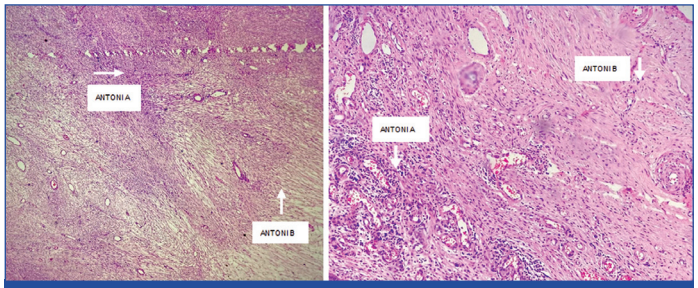
[Table/Fig-1]: Diagnostic nasal endoscopy image revealing a mass in the left nasal cavity (white arrow).



[Table/Fig-2]: CT nose and paranasal sinus showing a lesion in the left nasal cavity: (a) Sagittal cut; b) Coronal cut. (Red arrows indicate the lesion in the left nasal cavity).

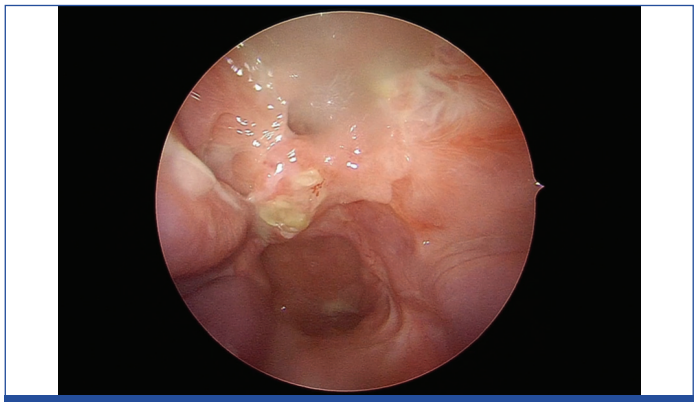
Gross examination revealed a grey-white, lobulated mass with a firm consistency. Histopathological analysis demonstrated a fairly circumscribed neoplasm composed of spindle cells arranged in a biphasic pattern, with areas of both hypercellularity and hypocellularity. The cells exhibited indistinct borders, scant-to-moderate cytoplasm

and vesicular nuclei. Based on these classical histopathological features, a final diagnosis of schwannoma was made. No further immunohistochemical testing was performed [Table/Fig-3].



[Table/Fig-3]: Histopathological examination of schwannoma showing regions of hypercellularity (Antoni A) and hypocellularity (Antoni B) (H&E 40x).

Nasal endoscopic examinations were performed at 1, 3 and 6 months postoperatively [Table/Fig-4]. At the one-year follow-up, no recurrence was observed on repeat CT imaging.



[Table/Fig-4]: Diagnostic nasal endoscopy done six months postoperatively.

Case 2

A 46-year-old female presented with complaints of left-sided nasal obstruction and discharge for eight months. The nasal discharge was scanty, colourless, mucoid in nature, non blood-stained and non foul smelling. She also gave a history of mouth breathing and snoring for the past six months. There was no history of nasal bleeding or ear-related complaints.

Anterior rhinoscopy revealed a pale mass in the left nasal cavity, abutting the septum medially and the lateral wall laterally, extending anteriorly up to the anterior end of the inferior turbinate. On probing, the mass was insensitive to touch and did not bleed. Cough impulse was negative.

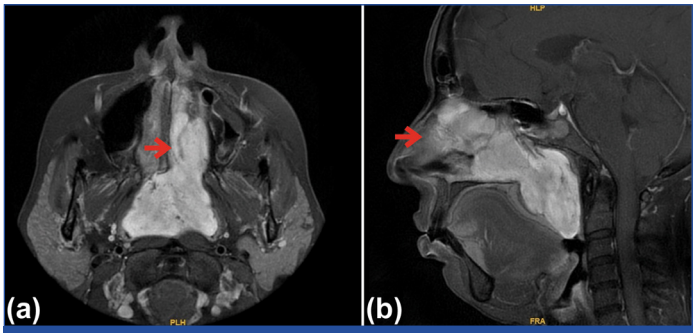
Diagnostic nasal endoscopy revealed a pale pinkish, polypoidal mass in the left nasal cavity extending into the nasopharynx.

Contrast-enhanced MRI of the nose and paranasal sinuses showed a relatively well-defined lobulated mass lesion appearing isointense on T1-weighted images and heterogeneously hyperintense on T2-weighted images, with a few flow voids. The lesion measured 8.7×5.7×4.1 cm and predominantly occupied the left nasal cavity, causing severe thinning of the left lamina papyracea and bowing of the nasal septum to the right [Table/Fig-5].

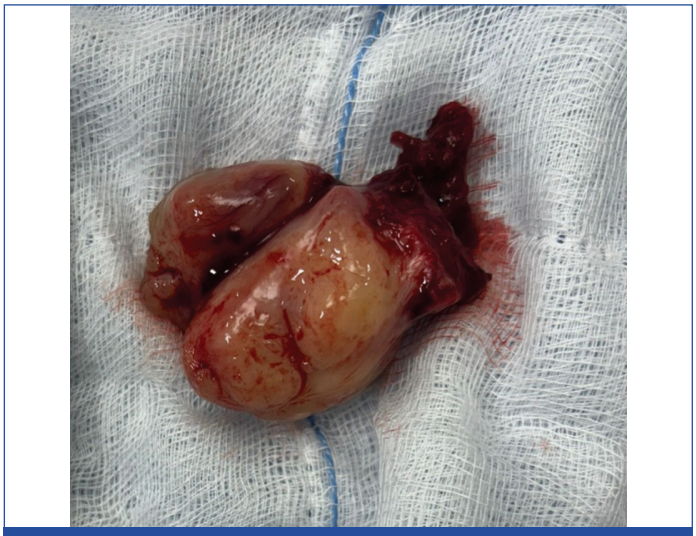
Based on the endoscopic and radiological findings, a provisional diagnosis of sinonasal schwannoma was made.

Given the well-defined nature of the lesion, complete transnasal endoscopic excision of the tumour was performed with coblator assistance and the mass was successfully removed in toto. Intraoperatively, the tumour was found to have multiple attachments to the lateral wall as well as the nasal septum; however, no discernible nerve of origin was identified.

On gross examination, a greyish-white lobulated mass measuring approximately 5.5×4×3.5 cm was noted. The mass was firm in consistency [Table/Fig-6].

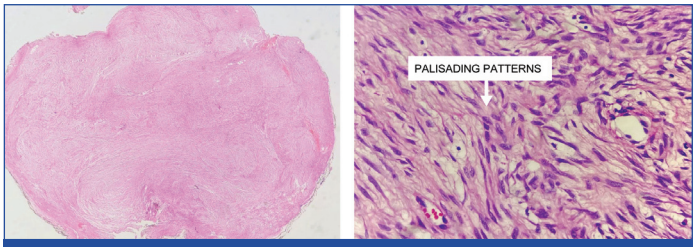


[Table/Fig-5]: A contrast-enhanced MRI nose and paranasal sinuses showing a lesion in the left nasal cavity (a) Axial cut; b) Sagittal cut) (The red arrow indicates the hyperintense mass occupying the left nasal cavity).
No bony erosions were noted.



[Table/Fig-6]: Gross specimen revealing lobulated mass.

Histopathological examination revealed a fairly circumscribed lesion composed of spindle-shaped cells arranged in a biphasic pattern, with hypercellular areas (Antoni A), hypocellular areas (Antoni B) and nuclear palisading. Individual cells were spindle-shaped with moderate eosinophilic cytoplasm and wavy hyperchromatic nuclei [Table/Fig-7].



[Table/Fig-7]: Histopathological examination of schwannoma showing regions of palisading patterns (H&E 4x, 40x). (Images from left and right)
On one year follow-up, no recurrence was noted.

Case 3

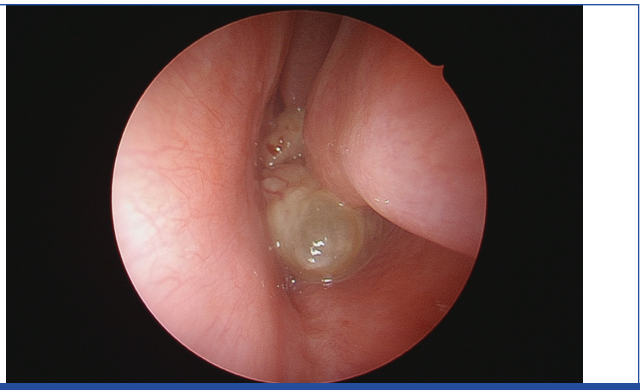
A 34-year-old female presented to the outpatient department with complaints of left-sided nasal obstruction for the past three months. She also reported watering of the left eye during the same period. There were no other significant complaints.

Diagnostic nasal endoscopy revealed a pale polypoidal mass in the left nasal cavity occupying the inferior meatus and extending up to the choana [Table/Fig-8].

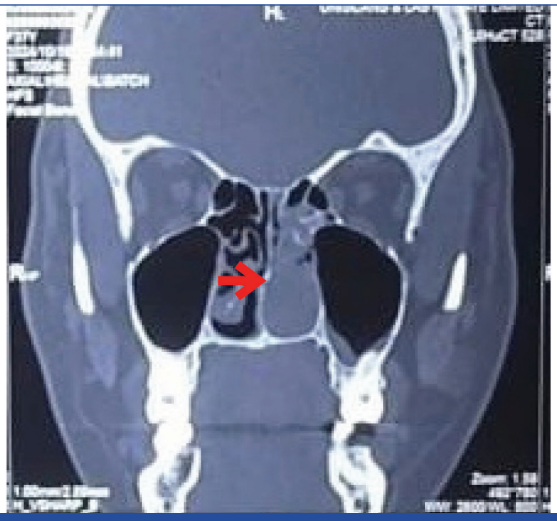
Plain CT of the nose and paranasal sinuses showed complete soft-tissue density opacification of the left nasal cavity extending up to the choana [Table/Fig-9].

A differential diagnosis of antrochoanal polyp, inverted papilloma and sinonasal schwannoma was considered.

Intraoperatively, a pale polypoidal mass was noted in the inferior meatus arising from the posterior part of the nasal septum. The



[Table/Fig-8]: Diagnostic nasal endoscopy image revealing a mass in the left nasal cavity.



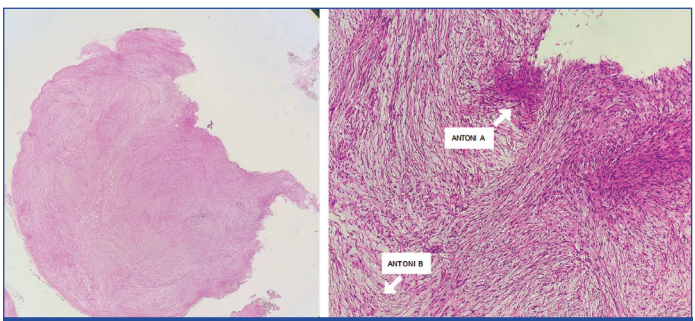
[Table/Fig-9]: CT nose and paranasal sinus showing a lesion in the left nasal cavity (Coronal cut) (Red arrows indicate the soft-tissue density in the left nasal cavity).

lesion was removed in toto using a microdebrider. Multiple biopsies were obtained and sent for histopathological examination.

On gross examination, multiple grey-brown soft-tissue fragments measuring a total of 3×2×0.5 cm were noted.

Histopathological examination revealed polypoidal fragments of tissue lined by respiratory epithelium, with the subepithelium showing a lesion composed of spindle cells arranged in fascicles, exhibiting compact hypercellular (Antoni A) and hypocellular (Antoni B) areas, along with nuclear palisading at the periphery forming Verocay bodies, suggestive of ancient schwannoma. There was no evidence of atypia, increased mitotic activity, or malignancy [Table/Fig-10].

At six-month follow-up, no recurrence was observed.



[Table/Fig-10]: Histopathological examination of schwannoma showing regions of hypercellularity (Antoni A) and hypocellularity (Antoni B) (H&E 4x, 10x). (Images from left to right)

DISCUSSION

Sinonasal schwannomas more commonly affect the nasal cavity and ethmoid sinus compared to other paranasal sinuses [2]. It is believed that sinonasal schwannomas arise from the ophthalmic and maxillary branches of the trigeminal nerve or from the autonomic nerves supplying the septal vessels and mucosa [3].

Sinonasal schwannomas are typically observed in individuals between the fourth and sixth decades of life, with no significant sex or racial predilection [4]. However, they may occur across a wide age range, with reported cases spanning from 2 to 81 years [5]. In the present series, patients ranged from the second to the fifth decades of life.

The clinical presentation of sinonasal schwannomas varies depending on the tumour's origin and extent. Most patients present with rhinological symptoms, including unilateral nasal obstruction, epistaxis, olfactory disturbances and facial pain. Craniofacial deformities such as proptosis and facial swelling, along with neurological symptoms including headache, nausea and specific cranial nerve palsies, have also been reported. These features typically indicate advanced disease with orbital and/or intracranial involvement at the time of presentation [3,6,7].

In the present series, two patients presented with progressively worsening nasal obstruction, while one patient presented with nasal obstruction associated with recurrent epistaxis. The clinical features observed in the patients were consistent with those reported in the existing literature.

Schwannomas most commonly occur as isolated, sporadic tumours. However, several studies have reported their association with hereditary syndromes such as neurofibromatosis type 2, schwannomatosis and Carney's complex [8-13]. In these syndromic cases, patients may present with multiple schwannomas and other associated tumours, often accompanied by a family history of similar conditions [14,15]. In contrast, all patients in the present series presented with solitary lesions and lacked any familial predisposition, supporting a sporadic origin in each case.

Imaging modalities such as CT and MRI are essential for accurately delineating the extent of disease, particularly when there is possible extension into adjacent structures such as the orbit or anterior cranial fossa, which is crucial for surgical planning. On CT imaging, these tumours typically appear isoattenuating, while on MRI they are predominantly isointense on both T1- and T2-weighted images relative to the brainstem [2]. Most lesions also demonstrate contrast enhancement on CT and show strong enhancement on MRI [2].

Hasegawa SL et al., proposed that the absence of a capsule in schwannomas arising from mucosal regions may be attributed to their origin from autonomic nerves, which inherently lack an epineurium. Additionally, the unique biological environment of submucosal tissue may further influence this non encapsulated growth pattern [16].

Complete surgical resection is widely regarded as the primary treatment modality for sinonasal schwannomas. Various surgical approaches have been described, including external techniques such as lateral rhinotomy and midfacial degloving, purely endoscopic approaches, or a combination of external and endoscopic methods. The endoscopic endonasal approach has emerged as an effective treatment option, offering minimal morbidity and excellent long-term disease control [14].

In a study by Forer B et al., 10 patients with schwannomas of the nasal cavity and paranasal sinuses were managed using endoscopic surgery. All patients remained disease-free during follow-up. The authors concluded that when the tumour is confined to the nasal cavity, simple tumour excision without sinusotomy may be sufficient for complete resection. In cases of more extensive disease, a wider endoscopic approach may be required; however, none of the patients in their series required an external approach [12].

In a comprehensive review by Liao JY et al., endoscopic resection was the most frequently employed surgical approach, accounting for approximately 52.1% of cases [3]. Smaller, anteriorly located tumours were occasionally excised without endoscopic assistance when adequate surgical margins could be safely achieved. For more extensive lesions, open surgical techniques were preferred

to ensure optimal exposure, often necessitating elevation of local flaps. The open approaches reported included lateral rhinotomy, rhinoplasty, Caldwell-Luc or Denker's procedures, transpalatal incision, gingivobuccal incision and midfacial degloving.

Schwannomas, once completely excised, demonstrate a very low recurrence rate. Liao JY et al., reported that none of the 59 patients with available follow-up data experienced recurrence over a mean postoperative follow-up period of 3.58±3.14 years. These findings further support the effectiveness of complete surgical excision—particularly via an endoscopic approach—for long-term disease control in sinonasal schwannomas [3].

In all the present cases, the tumours were confined to the nasal cavity and paranasal sinuses. Given this limited extent, complete excision was successfully achieved using an endoscopic approach in all three patients.

CONCLUSION(S)

Complete surgical resection remains the gold standard for the management of sinonasal schwannomas, given their slow-growing and benign nature. Unilateral nasal symptoms should raise suspicion for sinonasal tumours, including schwannomas. Accurate diagnosis and timely surgical intervention are essential for effective management and favourable outcomes.

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