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SINONASAL SCHWANNOMA: CASE REPORT OF A RARE TUMOR IN AN UNCOMMON SITE

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ABSTRACT Sinonasal schwannomas are exceedingly rare benign peripheral nerve sheath tumors, constituting less than 4% of all schwannomas in the head and neck region and less than 1% of all tumors in the sinonasal tract [4,5]. Schwannomas arise from Schwann cells, which ensheath peripheral, cranial, and autonomic nerves. Given the complex innervation of the sinonasal region—particularly branches of the ophthalmic and maxillary divisions of the trigeminal nerve—schwannomas may arise from any of these neural elements. Its diagnosis is based on histology and immunohistochemistry. Complete surgical excision is the most recommended treatment option, and endoscopic surgery has been widely performed in recent years. In this study we presented a 41 yr old female patient with complaints of right sided rhinorrhea , nasal obstruction and intermittent epistaxis from last 3-4 months. Diagnostic nasal endoscopy & CT of PNS along with excision biopsy was done. The biopsy was diagnosed as sinonasal schwannoma which was confirmed with IHC S-100 marker. With rare presentation of schwannoma in sinonasal tract , makes it ideal to document it for educational purpose.

KEYWORDS : Sinonasal, Schwannoma, S-100

INTRODUCTION

The myelin sheath of nerve fibers is made up of Schwann cells, which give birth to the uncommon, slow growing benign tumors known as Schwannomas. The majority of these affect middle-aged adults, with comparable dispersion by race and gender. They typically affect young to middle-aged adults, with no strong gender predilection. These tumors account for less than 4% of all head and neck schwannomas, though they can occur anywhere in the body more frequently on the limbs with a predilection for upper limbs. Of all head and neck cases, schwannomas originating from the nasal cavity and paranasal sinuses make up around 0.5 to 4% incidence (1,2). Most sinonasal schwannomas are sporadic and solitary, but they can occasionally be associated with neurofibromatosis type 2 (NF2) or schwannomatosis. These tumors originate from the branches of the autonomic nervous system or from the ophthalmic or maxillary divisions of the trigeminal nerve in the paranasal sinuses. Nasal obstruction, epistaxis, rhinorrhea, anosmia, headache, and other symptoms are clinical manifestations of sinonasal schwannomas. The treatment is complete resection, and the most reliable method for diagnosing it is still histopathology. To differentiate schwannomas from inflammatory polyps, inverted papillomas, neuroblastomas and other pathological entities, ancillary tests immunostaining for S-100 protein is useful. (3). After surgery, recurrence is uncommon. We discuss here a case of sinonasal schwannoma, and we reviewed the literature to compile details about the condition's symptoms, cause, diagnosis, and IHC—all of which are contribute to the diagnosis of this rare presentation tumor.

Case Report

In May 2025, a 41 year old female patient visited ENT OPD in SCMCH & RI Channaptana with complaints of right sided rhinorrhea , nasal obstruction and intermittent epistaxis from last 3-4 months. Diagnostic nasal endoscopy revealed mass located in the right anterior nasal cavity abutting the nasal septum and lateral wall was observed .Septum-sharp spur on right and high deviation to left, a smooth surfaced mass seen occupying right nasal cavity appears to be extending from skull base to inferior turbinate, mass is medial to middle turbinate. Firm in consistency, can be probed only laterally. CT scan of PNS showed well defined homogenous enhancing mass lesion in anterior right nasal cavity in middle meatus region approx measuring 4x2.8x2.7cms, Rounded soft tissue density lesion arising from floor and posterior wall of maxillary sinus. With the possibilities of a nasal cavity tumor , excision biopsy was done. The resected specimen was sent for histopathology examination, received grey white to brown soft tissue mass measuring 2.0 x1.5x 1.0cms. Histopathological sections submitted from nasal mass show tissue lined by respiratory epithelium, subepithelium showed well defined neoplasm composed of bland spindle cells arranged in short fascicles , containing more densely cellular areas with nuclear pallisading (Antoni A) alternating with hypocellular areas (Antoni B). Occasional verocay bodies noted. Focal areas of myxoid degeneration with occasional mitotic figures 1-2/10 hpfs noted. No evidence of atypia or malignancy was found. With these features, a diagnosis of benign nerve sheath tumor Schwanomma was made which was further confirmed by IHC S-100. Immunohistochemically most of the spindle cells were positive for S-100 which confirmed the diagnosis of Schwannoma in sinonasal region , a rare presentation.

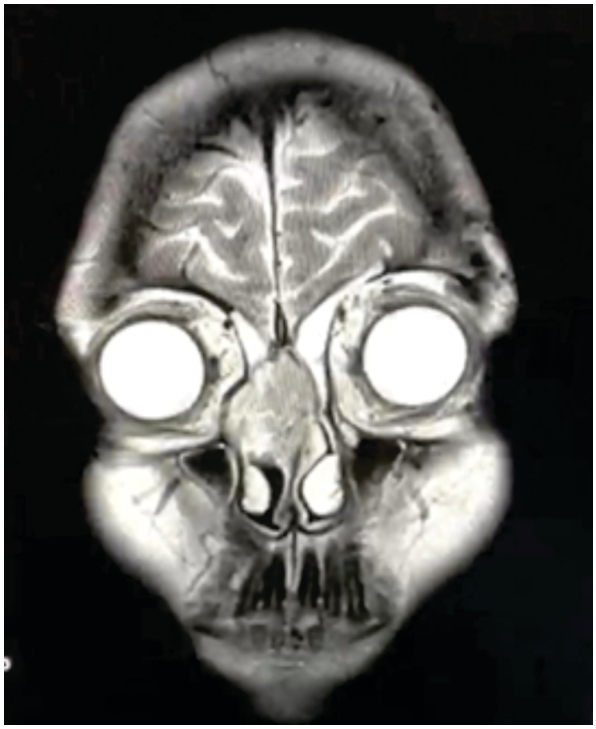

Figure 1. Computed Tomography Scan: Rounded, Homogeneous, Soft Tissue Mass Over the Right Middle Meatus, Causing a Partial Obstruction and Pushing the Nasal Septum

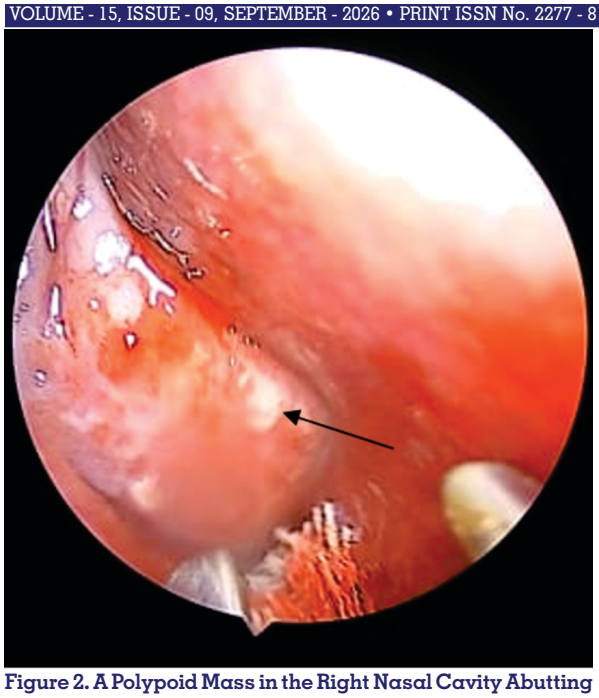

Figure 2. A Polypoid Mass in the Right Nasal Cavity Abutting the Lateral Nasal Wall and Septum

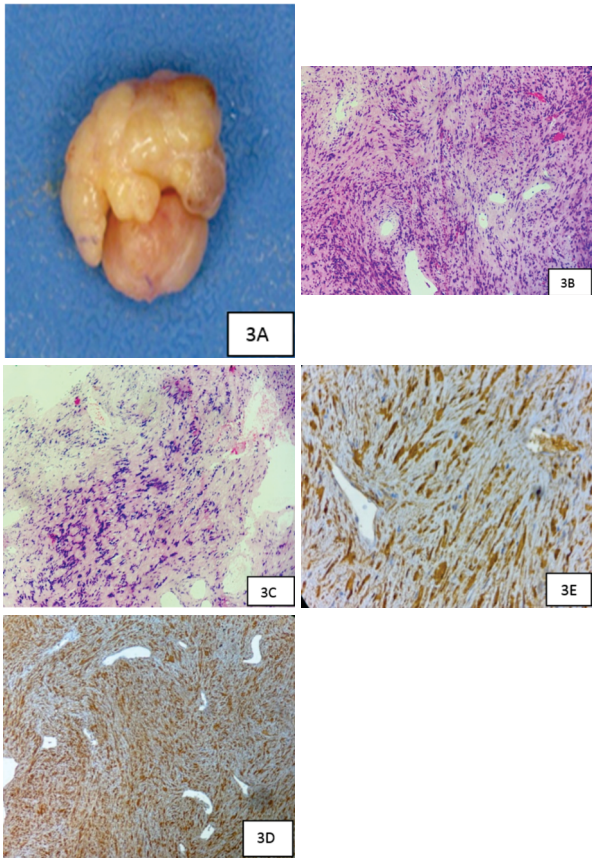

Figure 3 A-E. A, Spindle Tumor Cells Arranged in Short Fascicles with Alternating Hyper & Hypocellular Areas. Hypercellular Areas Show Nuclear Palisading, Strong Immunoreactive Stain of S-100 Protein.

DISCUSSION

Sinonasal schwannomas are exceedingly rare benign peripheral nerve sheath tumors, constituting less than 4% of all schwannomas in the head and neck region and less than 1% of all tumors in the sinonasal tract [4,5]. Schwannomas arise from Schwann cells, which ensheath peripheral, cranial, and autonomic nerves. Given the complex innervation of the sinonasal region—particularly branches of the ophthalmic and maxillary divisions of the trigeminal nerve—schwannomas may arise from any of these neural elements [6].The clinical presentation is typically nonspecific and depends on the size, location, and extension of the lesion. Patients commonly present with unilateral nasal obstruction, epistaxis, facial pain or swelling, anosmia, or headache. These symptoms often mimic those of inflammatory polyps or other sinonasal tumors, leading to frequent delays in diagnosis [7]. In some cases, the tumor may extend into adjacent structures such as the orbit or anterior cranial fossa, potentially causing proptosis, visual changes, or neurologic symptoms [8].Imaging plays a critical role in evaluating the extent of the tumor, surgical planning, and monitoring recurrence. On computed tomography (CT), sinonasal schwannomas usually appear as well-demarcated, expansile soft-tissue masses with pressure-induced remodeling of adjacent bony walls rather than frank destruction, a feature that helps differentiate them from malignant lesions [9]. Magnetic resonance imaging (MRI) typically shows a heterogeneous mass, iso- to hypointense on T1-weighted images and hyperintense on T2-weighted images, often with heterogeneous enhancement after contrast administration. The classic "target sign" seen in neurofibromas is not commonly observed in schwannomas [10].Definitive diagnosis requires histopathological examination. Schwannomas are encapsulated tumors composed of spindle cells arranged in a biphasic pattern. Antoni A areas are cellular zones with nuclear palisading and Verocay body formation, whereas Antoni B areas are less cellular and more myxoid [11]. Mitotic activity is generally absent or low, and cytologic atypia is minimal. These features are crucial for distinguishing schwannomas from their malignant counterparts. Immunohistochemically, schwannomas show strong and diffuse positivity for S-100 protein, confirming neural crest origin. Other supportive markers include SOX-10 and GFAP in some cases [12]. A low Ki-67 index (<5%) is typically observed, indicating low proliferative activity. Given their histology appearance, sinonasal schwannomas must be differentiated from other spindle cell neoplasm such as:

- Neurofibroma: Lacks encapsulation, shows a more haphazard arrangement of spindle cells, and may contain axons (highlighted by neurofilament protein).
- Solitary fibrous tumor (SFT): Usually CD34-positive, STAT6 nuclear positive, and S-100 negative.
- Fibrosarcoma or MPNST: Show marked atypia, increased mitoses, necrosis, and variable S-100 expression.

Although both schwannomas and neurofibromas are immunoreactive with the S-100 protein, S-100 protein immunostaining is more intense on schwannomas than on neurofibromas. Moreover, Calretinin and CD56 are also highly specific for schwannomas, while CD34 and factor XIIIa are more sensitive for neurofibromas. [13]. These markers further assist the differential diagnosis. Our case had an intense immunostaining for S-100 protein , leading to the diagnosis of schwannoma.

Complete surgical excision remains the treatment of choice. In recent decades, the endoscopic endonasal approach has become the preferred modality due to reduced morbidity, better visualization, and shorter recovery times, particularly for tumors confined to the nasal cavity and paranasal sinuses [14]. For tumors extending into the orbit or cranial cavity, combined endoscopic and open approaches may be necessary.

Recurrence is rare if complete excision is achieved, but may occur in cases of subtotal resection or deep skull base involvement. There are no established roles for radiotherapy or chemotherapy in benign schwannomas. Malignant transformation is extremely rare and usually associated with underlying genetic syndromes like Neurofibromatosis type 1

or prior radiation exposure [15].

CONCLUSION

Sinonasal schwannoma, while rare, should be considered in the differential diagnosis of unilateral nasal masses, especially in adults presenting with slowly progressive symptoms. Imaging is helpful but not definitive; thus, histopathological evaluation with immunohistochemistry remains essential for diagnosis. Complete surgical excision offers excellent outcomes with low recurrence rates. A multidisciplinary approach is often necessary for optimal management, especially in lesions with intracranial or orbital extension.

Conflict of Interest: None

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