ASIDE Case Reports

Case Report

Hybrid Schwannoma of the Nasal Cavity: A Rare Case Report with Literature Review

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ABSTRACT

Sinonasal schwannomas are extremely rare, comprising only 4% of all head and neck schwannomas. Their atypical location and nonspecific symptoms often result in delayed diagnosis. This case highlights a rare hybrid schwannoma in the right nasal cavity of a young female, contributing to the limited literature on sinonasal nerve sheath tumors. A 27-year-old female presented with a one-year history of right-sided nasal obstruction, rhinorrhea, and recurrent epistaxis. Examination revealed a polypoidal mass in the right nasal cavity. Laboratory investigations showed mild anemia and an elevated white cell count. Imaging identified a soft tissue mass with no bone erosion or intracranial involvement. The patient underwent Functional Endoscopic Sinus Surgery (FESS), and histopathological analysis confirmed a hybrid nerve sheath tumor (70% schwannoma, 30% neurofibroma) with positive staining for S-100 and CD34. Postoperative MRI showed no residual or recurrent mass. This case underlines the importance of considering rare neural tumors in the differential diagnosis of nasal masses. Early surgical intervention with histological confirmation ensures favorable outcomes and prevents complications associated with delayed treatment.

1. Introduction

Schwannomas are rare benign tumors that originate from Schwann cells and are responsible for producing the myelin sheath around peripheral nerves. They typically affect middle-aged adults without preference for gender or ethnicity and can occur throughout the body, with around 45% of schwannomas arising from the head and neck region. Of these, only about 4% arise in the nasal cavity and paranasal sinuses. Symptoms of sinonasal schwannomas are often nonspecific and may include nasal obstruction, epistaxis, rhinorrhea, anosmia, headache, or facial swelling, leading to delayed diagnosis. Surgical removal is the treatment of choice, and a definitive diagnosis is confirmed through histopathological examination [1, 2].

These benign, well-encapsulated tumors originate from Schwann peripheral nerve sheath cells. Recurrence following surgical removal is uncommon.[3] Despite originating from a single cell type, schwannomas can exhibit a wide range of cellular morphologies. Variants include cellular, cystic, ancient, epithelioid, melanotic, pseudo glandular, psammomatous, and plexiform forms [4, 5].

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Polypoid lesions in the nasal cavity are commonly of inflammatory origin, whereas nerve sheath tumors are rarely encountered in this region. These tumors typically originate from branches of the trigeminal nerve. Pathologists should recognize this uncommon presentation; thorough evaluation is essential to rule out malignant potential [6].

What makes this case especially noteworthy is the discovery of a hybrid schwannoma—a rare tumor made up of both schwannomatosis and neurofibromatosis components—located in the right nasal cavity of a young woman [7].Tumors like this are extremely uncommon in this part of the body and can easily be mistaken for more typical nasal conditions, such as polyps, making diagnosis challenging. By sharing this case, we aim to highlight its unusual presentation and key clinical, imaging, surgical, and histological findings to help other clinicians recognize and manage similar cases more effectively.

2. Case Presentation

The patient is a 27-year-old woman of Punjabi descent who came to the ENT department with a one-year history of right-sided nasal obstruction, ongoing nasal discharge, and frequent episodes of nosebleeds. She had no previous history of sinus-related conditions such as chronic sinusitis, asthma, or allergic rhinitis, and she was not taking any regular medications. There were no known allergies, including common triggers like aspirin or NSAIDs, and no signs of immunodeficiency disorders such as Churg-Strauss syndrome. Her family history was unremarkable, with no relatives affected by similar nasal issues, neurofibromatosis, or hereditary conditions

like cystic fibrosis. Socially and psychologically, there were no notable concerns, and she had not undergone any previous surgeries or medical treatments related to her current symptoms.

The patient was alert, oriented, and vitally stable, with no signs of systemic illness or skin lesions suggestive of neurofibromatosis. An anterior rhinoscopy showed a fleshy, polypoidal mass in the right nasal cavity, extending from the inferior to the medial wall. The mass appeared vascular and non-friable. The nasal septum was deviated to the left, with a visible septal spur**(Figure 1)**.

Posterior rhinoscopy was unremarkable. Ear and throat examinations were normal, with intact tympanic membranes and a clear oropharynx. There was no cervical lymphadenopathy, and neurological examination showed no deficits.

Blood samples were taken and sent for baseline laboratory analysis, which yielded the following results. The patient was given the choice to send her blood samples to either our institute's laboratories or some other laboratory, and she opted for the latter Section 2. Pre-operative imaging, including a CT scan of the paranasal sinuses, was performed (prior to her presentation with our team) without contrast using axial slices of 3 mm thickness and reformatted coronal slices. The findings revealed bilateral mild mucosal thickening in the maxillary and ethmoid sinuses. A soft tissue opacity was noted in the right lower nostril, measuring approximately 2.1 × 1.6 cm. A deviated nasal septum (DNS) was also identified, with convexity toward the left side and a small spur. There was no evidence of intracranial or intraorbital extension, and no signs of bone erosion were observed. The impression was bilateral maxillary and ethmoid sinusitis and a soft tissue opacity in the right lower nostril, for which clinical correlation was advised. Multiple differential diagnoses for the nasal mass were considered based on the examination and imaging findings. Neoplastic lesions such as inverted papilloma, hemangioma, and nasopharyngeal angiofibroma. Inflammatory or reactive conditions like chronic inflammatory polyps and fungal sinusitis. Structural abnormalities such as turbinate hypertrophy and encephalocele. As such, histopathological evaluation remained essential for confirmation and further treatment management.

This patient's treatment was performed in a state-of-the-art tertiary care hospital in Lahore, Pakistan, with access to diagnostic modalities such as CT scan, MRI, and a well-equipped pathology lab. However, the patient was allowed to use the diagnostic services of other hospitals. She opted to utilize the services of the nearest government-funded hospital, whichprovides subsidized rates for these diagnostic modalities.

The patient, with ongoing symptoms, was scheduled for Functional Endoscopic Sinus Surgery (FESS) and septoplasty. Endoscopic surgery has been mostly reported in the recent 20 years and is becoming the most widely used procedure. Even in extensive diseases, no recurrence is reported after endoscopic surgery.[8] In the past, more invasive transcranial and transfacial methods were employed for removal but are employed for those tumors which have undergone malignant transformation.[9] During surgery, a polypoidal vascular mass was found in the right nasal cavity, attached to the lateral wall above the inferior turbinate. Hemostasis was achieved, after which the mass was removed, and the nasal cavity was packed. A sample was sent for histopathological analysis. A surgical pathology examination was performed on the mass excised from the right nasal cavity at Aga Khan Laboratories, a state-of-the-art tertiary hospital in Pakistan. Gross examination described a single, soft, polypoidal tan-white to tan-brown tissue measuring 2.6 × 2.2 cm. Microscopically, the mucosa-covered tissue showed a neoplastic lesion composed of short fascicles and nests with alternating hypercellular and hypocellular areas. The neoplastic cells had hyperchromatic nuclei, inconspicuous nucleoli, and moderate cytoplasm. A few mitotic figures were noted, and the stroma appeared collagenous. Some cellular areas showed typical Verocay body formation. Interspersed, thin-walled blood vessels

Table 1: Laboratory Parameter Trends Over Time

Parameter	pre surgery	post surgery	Reference Range / Normal
White Blood Cells (WBCs) ($\times 10^9$/L)	8.7	10.3	4.0 – 10.0
Neutrophils (%)	45	60	40 – 75
Lymphocytes (%)	50	30	20 – 50
Eosinophils (%)	3	6	1 – 6
Monocytes (%)	2	4	2 – 10
Hemoglobin (Hb) (g/dL)	11.8	10.5	12.0 – 16.0
Red Blood Cell Count (RBC) ($\times 10^{12}$/L)	4.73	4.00	4.0 – 5.50
Hematocrit (Hct) (%)	40.3	34.3	40.0 – 54.0
Mean Corpuscular Volume (MCV) (fL)	85.2	85.8	80.0 – 100.0
Mean Corpuscular Hemoglobin (MCH) (pg)	24.9	26.3	27.0 – 34.0
MCH Concentration (MCHC) (g/dL)	29.3	30.6	32.0 – 36.0
RDW-CV (%)	14.4	14.3	—
RDW-SD (fL)	12.5	8.7	11.5 – 14.5
MPV (Mean Platelet Volume) (fL)	10.0	11.9	7 – 11
Platelet Count ($\times 10^9$/L)	325	422	150 – 450
PT (Prothrombin Time) (sec)	13	—	12 – 15
INR	0.93	—	∼1.0 (normal, non-anticoagulated)
APTT (sec)	36	—	30 – 45
HBs Ag	Negative	—	Negative
HCV	Negative	—	Negative
Blood Urea (mg/dL)	—	27	10 – 50
Serum Creatinine (mg/dL)	—	0.93	0.6 – 1.2 (Female)

WBCs, White Blood Cells; Hb, Hemoglobin; RBC, Red Blood Cell Count; Hct, Hematocrit; MCV, Mean Corpuscular Volume; MCH, Mean Corpuscular Hemoglobin; MCHC, Mean Corpuscular Hemoglobin Concentration; RDW-CV, Red Cell Distribution Width-Coefficient of Variation; RDW-SD, Red Cell Distribution Width-Standard Deviation; MPV, Mean Platelet Volume; PT, Prothrombin Time; INR, International Normalized Ratio; APTT, Activated Partial Thromboplastin Time; HBs Ag, Hepatitis B Surface Antigen; HCV, Hepatitis C Virus.

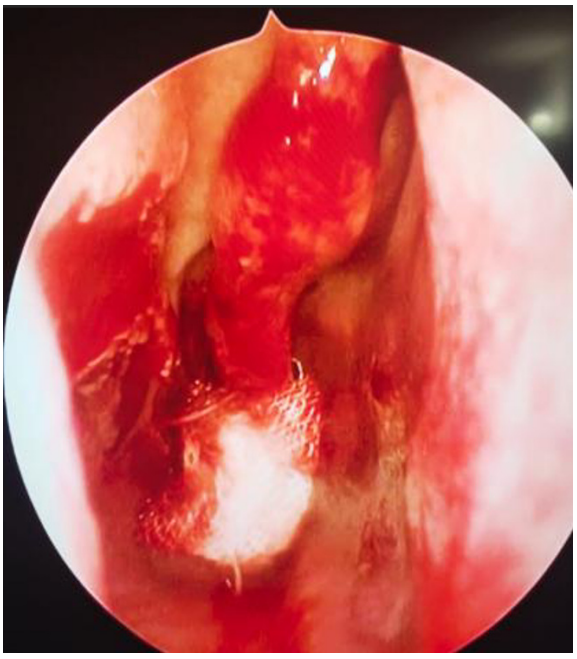

Figure 1: Endoscopic view showing a polypoidal vascular mass in the right nasal cavity, attached to the lateral wall above the inferior turbinate

were present. There was no evidence of increased mitoses, cytological atypia, or sarcomatous transformation. Immunohistochemical staining showed positivity for CD34 and S100, while TLE-1 was negative. The diagnosis concluded that the lesion was a polypoid vascular mass identified as a hybrid nerve sheath tumor, composed of 70% schwannoma and 30% neurofibroma, with no malignant features.

The patient recovered well following surgery, with no immediate postoperative complications. She reported significant relief from her symptoms, including complete resolution of nasal obstruction and nosebleeds, and remained clinically stable. As part of her follow-up, the case was reviewed in a multidisciplinary team meeting, and a contrast-enhanced MRI was performed six weeks later to assess for any residual tumor. The MRI revealed no enhancing soft tissue mass in the nasal cavity, confirming successful tumor excision. The absence of the right inferior turbinate was consistent with surgical removal. Mild mucosal thickening was seen in both maxillary sinuses, with a slightly thickened area along the superior wall of the left maxillary sinus, measuring 5mm in thickness, suggesting sinusitis. Importantly, there was no evidence of intraorbital extension, and the adjacent anatomical structures appeared normal, including the orbits, salivary glands, and brain. The patient tolerated the MRI well, with no complications or unexpected adverse events, as the patient was not claustrophobic, and no technical issues were reported during the procedure. Overall, the follow-up findings supported a favorable outcome with no signs of recurrence. A summary of the clinical timeline is provided in Section 2.

3. Discussion

This case report gives a detailed clinical and histopathological analysis of a rare hybrid sinonasal schwannoma. It adds to the limited literature on hybrid schwannomas compared to nasal polyps, providing valuable insight into the differential diagnosis. Hybrid sinonasal schwannomas are extremely rare and can pose a real diagnostic challenge, such as when the schwannoma is suspected

Table 2: Timeline of Clinical Events and Interventions

Time	Event
12 months prior	Onset of right-sided nasal obstruction, rhinorrhea, and recurrent epistaxis
At presentation	Clinical evaluation, nasal endoscopy, and lab tests were performed. CT scan of paranasal sinuses revealed the right nasal mass and DNS.
Scheduled surgery	Underwent Functional Endoscopic Sinus Surgery (FESS) with septoplasty
Post-op (6 weeks)	MRI was performed to evaluate residual disease; no recurrent mass was observed

DNS, Deviated Nasal Septum; FESS, Functional Endoscopic Sinus Surgery; MRI, Magnetic Resonance Imaging; CT, Computed Tomography.

to originate from the sphenopalatine or lateral nasal branches of the maxillary nerve. There are many instances in medical literature of hybrid schwannomas being of dermal or subdermal origin, thus making them uncommon in the sinonasal region [10]. Hence, their presence near the sphenopalatine foramen and maxillary nerve branches demands careful evaluation and detailed histopathological analysis. What makes hybrid schwannomas particularly tricky is their mixed composition—about 60 to 70% schwannomatous, which stain S-100 and SOX10 positive and the remainder 30 to 40% perineural cells staining claudin 1 and GLUT1-positive—often leading to misidentification as more common sinonasal tumors [11, 7]. Recognizing them early is crucial, as delayed diagnosis can result in worsening nasal obstruction, persistent facial pain, and even orbital involvement, significantly affecting a patient's quality of life.

Schwannomas are benign peripheral nerve sheath tumors first described by José Juan Verocay in 1910. These tumors typically affect individuals aged 40 to 60, though they can occur at any age, with a peak incidence between 2 and 81 years [12]. Nasal cavity schwannomas are rare, constituting only 4% of sinonasal tumors. They are predominantly female (F: M ratio 1.8:1) [13]. Most schwannomas in the head and neck arise from the trigeminal nerve, and they are rarely seen in the nasal cavity or paranasal sinuses, including the ethmoid, maxillary, and sphenoid sinuses [14].

Histopathologically, schwannomas are classified into Antoni-A and Antoni-B types. Antoni-A areas have dense, organized stroma with spindle-shaped cells and rows of nuclei arranged in a palisading pattern, known as Verocay bodies. Antoni-B areas consist of a looser myxoid stroma with fewer spindle cells[15, 12, 16]. Schwannomas are strongly associated with neurofibromatosis type 2 (NF2), which commonly affects the vestibular nerve, while neurofibromatosis type 1 (NF1) is more linked to neurofibromas [17]. NF2 results from mutations in the NF2 gene, whereas mutations in the NF1 gene cause NF1. S-100 staining is essential for diagnosing schwannomas, as both schwannomas and neurofibromas react, but schwannomas show a stronger reaction. Calretinin and CD56 are more specific to schwannomas, while CD34 and factor XIIIa are sensitive to neurofibromas [15]. In this case, CD34 and S-100 were patchy positive, while TLE-1 was negative, though TLE-1's role in diagnosis is still being studied. Surgical resection is the main treatment for schwannomas [18, 19]. Approaches like midfacial degloving, lateral rhinotomy, or endoscopic surgery are used based on tumor location [6]. In this case, the mass was

removed via Functional Endoscopic Sinus Surgery (FESS) under general anesthesia.

Despite focusing on a rare case of sinonasal schwannoma, this study, being a single case report, is subjected to restricted generalizability, making it difficult to draw broader conclusions regarding hybrid schwannomas in the sinonasal region. Furthermore, the absence of long-term follow-up prevents a comprehensive assessment of recurrence risk and potential postoperative complications. Histopathological interpretation, despite confirming hybrid nerve sheath tumor features, remains subject to interobserver bias, which could influence classification accuracy. Additionally, imaging modalities were limited to CT and MRI, whereas functional imaging techniques such as PET scans might have provided further insights into tumor spread and metabolism. Another limitation is the lack of genetic analysis, as molecular studies on relevant mutations like NF1 or NF2 could enhance our understanding of the tumor's pathophysiology. Lastly, while Functional Endoscopic Sinus Surgery (FESS) was employed successfully, comparative data evaluating alternative surgical techniques would help contextualize treatment choices more effectively. These limitations emphasize the need for further research to refine diagnostic accuracy and optimize management strategies for hybrid schwannomas.

Considering the clinical picture, diagnosis, and follow-up, it is concluded that Schwannomas are benign, sex—and race-independent tumors that are rare in the head and neck and account for 4% of sinonasal cases. Diagnosis is confirmed via S-100 staining. In this case, the patient underwent FESS-assisted excision under general anesthesia and recovered without complications.

4. Conclusions

This case highlights the diagnostic challenge of hybrid sinonasal schwannomas, a rare entity often misidentified due to its mixed histological features. Accurate diagnosis relies on thorough histopathological and immunohistochemical analysis, particularly in lesions near the sphenopalatine foramen. Surgical excision via FESS proved effective, with an uncomplicated recovery. Despite its limitations, this report adds to the scarce literature and underscores the need for greater clinical awareness and further research into optimal diagnostic and management strategies.

Conflicts of Interest

The authors declare that they have no competing interests that could have influenced the objectivity or outcome of this investigation.

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Informed consent

Written consent was obtained from the patient to publish this case report and images. All relevant information and confidentiality rights were explained, and identifying details have been anonymized.

Large Language Model

None

Authors Contribution

All authors contributed equally to the manuscript, and all authors read and approved the final version of the manuscript.

Data Availability

All information presented in this case report is included within the manuscript. If further details are required, please contact the corresponding author.

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