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Epithelial Mysteries of the Nose: Unraveling Oncocytic Schneiderian Papilloma

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ABSTRACT

INTRODUCTION: Oncocytic papilloma also known as oncocytoma or oncocytic Schneiderian papilloma is a rare benign tumor arising from the Schneiderian mucosa of the nasal cavity and paranasal sinuses. It accounts for about 3–5% of all sinonasal papillomas and typically affects adults in the fifth to seventh decades of life.
CASE REPORT: A 68-year-old male patient came to our OPD with complaints of bilateral nasal obstruction, snoring and anosmia. Anterior rhinoscopic examination showed multiple pale polypoidal masses in the right nasal cavity. Nasal endoscopy revealed similar masses in the posterior part of the left nasal cavity covering the choana. Patient successfully underwent functional endoscopic sinus surgery without any complications.
CONCLUSION: Oncocytic sinonasal papilloma is a distinct benign neoplasm with a high risk of recurrence and malignant change. Early recognition, meticulous surgical excision, and vigilant follow-up are key to optimal management and better well-being lifestyle.

Keywords: Sinonasal papilloma, oncocytic papilloma, FESS, recurrence, Schneiderian membrane

INTRODUCTION

Oncocytic papilloma represents the rarest subtype of sinonasal papilloma. Although it most frequently originates in the maxillary sinus, it may also involve other paranasal sinuses. The earliest description of a sinonasal papilloma was documented by Ward in 1854. In 1991, the World Health Organization categorized sinonasal papillomas into three distinct histopathological types: exophytic, inverted, and oncocytic. Of these, exophytic and inverted papillomas are the most commonly encountered, whereas oncocytic papillomas—first characterized in the early 1980s—constitute only 3%–5% of all cases. Exophytic inverted papilloma and Oncocytic Schneiderian papilloma (OSP) predominantly arise from the lateral nasal wall and are most commonly identified in the maxillary sinus, nasal cavity, and ethmoidal sinus (1,2). Schneiderian papillomas, however, may also originate outside the sinonasal tract, with documented cases in the middle ear cavity, mastoid, nasopharynx, pharynx, and lacrimal sac (3).

No clear sex predilection has been observed in the development of OSP (4). Most patients are over 50 years of age at the time of diagnosis, and the youngest reported case in the literature involved a 33-year-old woman (5). Notably, malignancy has been reported in approximately 4%–17% of OSP cases (6). This report outlines the clinical presentation, diagnostic evaluation, and management of a patient with this rare entity.

CASE REPORT

A 68-year-old male presented to the ENT outpatient department with complaints of bilateral nasal obstruction for the past five years. The obstruction was insidious in onset, initially affecting the right side and gradually progressing to involve the left side. Symptoms worsened with exposure to cold weather and were temporarily relieved by nasal sprays. The patient also reported snoring and hyposmia. There was no history of trauma, epistaxis, nasal discharge, significant medical comorbidities. No previous surgical interventions of the nasal cavity or paranasal sinuses have been reported.

Anterior rhinoscopy revealed multiple pales, polypoidal masses occupying the right nasal cavity, which were firm, non-tender, non-bleeding on touch, and allowed passage of a probe around them. Posterior rhinoscopy demonstrated similar masses occupying and obscuring both choanae. Nasal endoscopy showed multiple pale polypoidal lesions extending from the anterior nares to the choana on the right side, with similar posterior masses in the left nasal cavity covering the choana. A left sided deviation of the nasal septum was also noted.

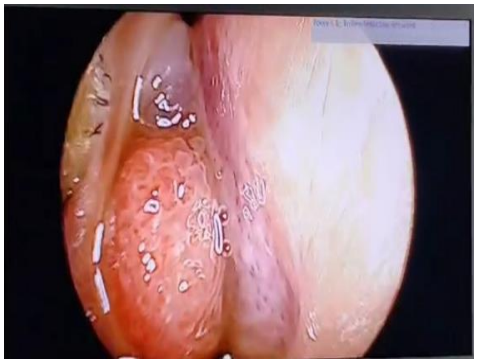

Fig.1 – Nasal endoscopy done with Zero degree rigid endoscope showing a mass in right nasal cavity

Initially, he was examined by an ear, nose, and throat (ENT) specialist and was diagnosed as right antrochoanal polyp and chronic maxillary sinusitis. Since topical and oral corticosteroid therapy along with oral antibiotics were not effective, the patient was subjected to a CT scan examination

CT scan of the nose and paranasal sinuses showed complete soft tissue opacification within the right maxillary sinus extending into the right nasal cavity and up to the opposite choana. The right osteomeatal complex was completely obliterated. On lateral wall of right maxillary sinus there was a bony projection probably denoting the site of origin of the mass but there was no bony destruction noted.

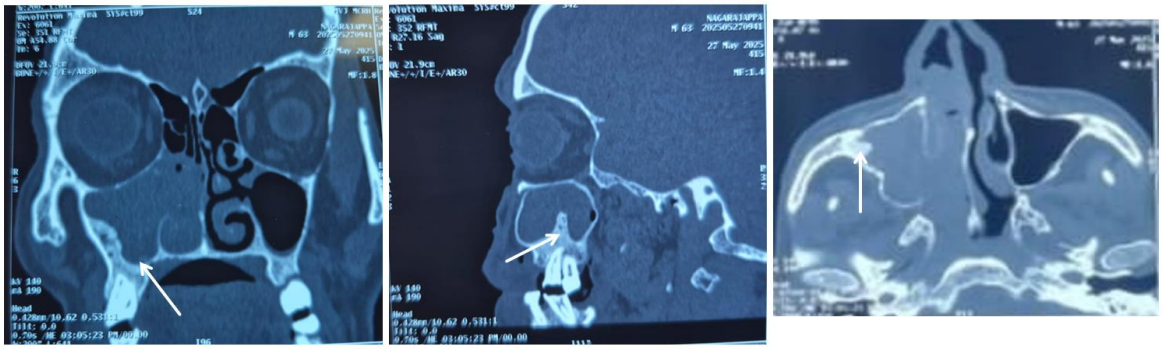

Fig.2(a) coronal view **Fig.2(b) saggital view** **Fig.2(c) axial view**

Fig.2 – NCCT scan of nose and PNS showing (a) complete soft tissue opacification in right maxillary sinus extending into right nasal cavity with obliteration of right osteomeatal complex, (b) hypertrophy in bony lateral wall of right maxillary sinus, (c) soft tissue opacification extending to left choanae

Patient underwent functional endoscopic sinus surgery (FESS) with septoplasty under general anaesthesia. All the soft tissue masses were removed from bilateral nasal cavities. Right maxillary ostium was widened and all the polypoidal tissue from the sinus were cleared along with which drilling of bone at the attachment site was performed (7). The specimens collected were sent for histopathological examination. Anterior nasal packing was done for 48 hours which was then removed and the patient was discharged.

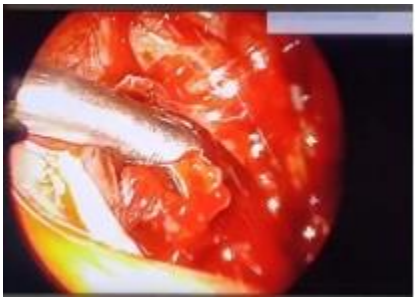

Fig.3

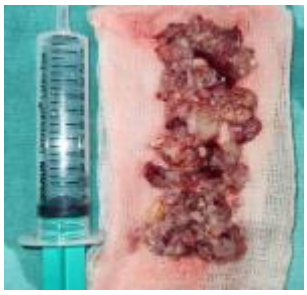

Fig.4

Figure 3 – Endoscopic removal of mass from maxillary sinus and nasal cavity

Figure 4 – Gross specimen (all the tissue removed from bilateral nasal cavities and right maxillary sinus) sent for Histopathological examination

Histopathological examination revealed findings suggestive of oncocytic papilloma of the nose. Radiation therapy was not recommended for this patient due to tumour location (8). Patient was followed for 6 months since inverted papilloma is characterised by a high recurrence rate (9,10) and no recurrence was found.

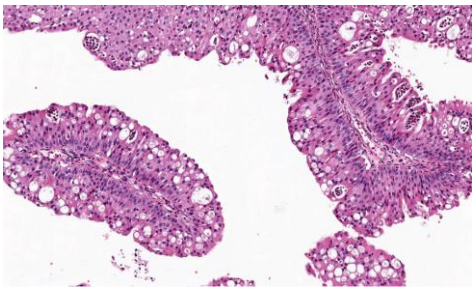

Figure 5 – On microscopy, normal respiratory epithelium with adjacent exophytic papillomatous growth showing pseudo-stratified columnar epithelium with eosinophilic cytoplasm and hyperchromatic nuclei. Stroma showing lymphocytic infiltration. Features suggestive of Oncocytic sinonasal papilloma

DISCUSSION

Oncocytic papilloma is a type of epithelial tumour that develops from the Schneider's membrane where the membrane comprises of few layers, including the epithelial lining, the lamina propria, and the bone interface. This membrane includes a richly vascularized lamina propria; osteoprogenitor cells which may be associated with cells, pericytes, within the microvascular walls (11) or in the bone marrow as adventitial subendothelial cells. Histologically, it is characterized by oncocytic epithelial cells - cells with abundant granular eosinophilic cytoplasm due to mitochondrial accumulation.

Sinonasal papilloma also known as Schneiderian papilloma is an uncommon type of epithelial tumour that develops from the Schneiderian membrane.

Etiology of Schneiderian papillomas is still unclear but chronic sinusitis, air pollution, and viral infections have been proposed. The etiopathogenetic factors of inverted or exophytic papillomas include human papillomavirus (HPV), mainly of the types 6, 11, 16, and 18 (12). However, there is no supporting data that proves that HPV is a provocative factor in development of oncocytic type (13,14). EGFR and KRAS mutations have been identified in some cases, suggesting different molecular pathways of tumorigenesis.

Patients usually present with non-specific symptoms like nasal obstruction, nasal discharge or epistaxis. The differential

diagnoses to be kept in mind are sinonasal inflammatory polyps, respiratory epithelial adenomatoid hamartoma, inverted ductal papilloma, verruca vulgaris, rhinosporidiosis, and invasive carcinoma. The clinical picture often mimics that of chronic rhinosinusitis or a benign nasal polyp, making histopathological diagnosis essential for confirmation. Imaging, particularly CT and MRI, helps delineate the extent of disease. On CT, the lesion appears as a soft tissue mass with possible remodeling or thinning of adjacent bone, but without frank bone destruction unless malignant transformation has occurred. MRI helps differentiate papillomas from inflammatory mucosal thickening due to their distinct enhancement patterns (15).

On histology, the classical Swiss cheese appearance is noted. It shows papillary and glandular epithelial proliferations lined by multilayered columnar oncocytic cells. These oncocytic cells have abundant, finely granular, eosinophilic cytoplasm due to the presence of numerous mitochondria - a hallmark feature confirmed by special stains or electron microscopy. The nuclei are round to oval, with small nucleoli, and the epithelium often contains intraepithelial microcysts filled with mucin or neutrophils. The architectural pattern can either be exophytic or endophytic. The stroma is usually edematous with chronic inflammatory infiltrates.

Although benign, oncocytic papilloma is known for its locally aggressive nature and there is tendency for recurrence if not completely excised. The reported recurrence rate ranges from 25% to 35%, particularly when the attachment site is not fully removed (8). Oncocytic papilloma show the highest risk of malignant transformation among the three types (4-17%). Squamous cell carcinoma is the most frequently reported malignant neoplasm arising in association with oncocytic papilloma. Other malignancies reported include mucoepidermoid carcinoma, epidermoid carcinoma, and sinonasal undifferentiated carcinoma (16). Sinonasal oncocytic papillomas are typically associated with synchronous malignancies, whereas metachronous malignant transformation is considered rare.

Treatment of choice is complete surgical excision through endoscopic surgery or open radical approach. In some cases, the drilling of the tumour growth zone is necessary to prevent a recurrence, once identified during the surgery (17). Lateral rhinotomy and medial maxillectomy may be required in cases of recurrence.

Postoperative long-term surveillance is essential, as recurrences can occur even years after initial surgery. Follow-up typically includes periodic nasal endoscopy and imaging at regular intervals. With complete surgical removal and adequate follow-up, the prognosis for oncocytic sinonasal papilloma is satisfactory.

CONCLUSION

An isolated unilateral process in the paranasal sinuses, especially when associated with long-standing symptoms, warrants thorough evaluation. Although such lesions are typically benign, their propensity for local invasion and recurrence emphasizes the need for early identification and complete surgical excision. Histopathological confirmation remains mandatory to establish the diagnosis accurately. Timely recognition, meticulous surgical management, and close postoperative follow-up are crucial for achieving favorable outcomes in these patients.

Abbreviations:

1. FESS – Functional endoscopic sinus surgery
2. OSP – Oncocytic Schneidarian papilloma
3. HPV – Human Papilloma Virus
4. EGFR – Epidermal growth factor receptor
5. KRAS – Kirsten rat sarcoma viral oncogene homolog
6. MRI – Magnetic Resonance Imaging

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