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Squamous Cell Carcinoma of the Nasal Cavity: A Case Report

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***Abstract*-- Squamous cell carcinoma (SCC) of the nasal cavity is a rare and aggressive malignancy within the spectrum of sinonasal tumors.**

Owing to its nonspecific early symptoms, diagnosis is frequently delayed, leading to locally advanced disease at presentation.

We report the case of a 46-year-old male patient with type 2 diabetes mellitus who presented with progressive right-sided nasal obstruction evolving over seven months, associated with intermittent mild epistaxis. Nasal endoscopy revealed a friable mass arising from the right middle meatus.

Radiological evaluation with computed tomography (CT) and magnetic resonance imaging (MRI) demonstrated a localized nasal cavity tumor without significant bony destruction or distant extension.

Histopathological examination confirmed a moderately differentiated squamous cell carcinoma. The patient underwent extended endoscopic surgical resection followed by adjuvant radiotherapy.

Postoperative recovery was uneventful, and no evidence of recurrence was observed during follow-up. This case highlights the diagnostic challenges, therapeutic considerations, and prognostic factors associated with nasal cavity SCC and emphasizes the importance of early detection and multidisciplinary management.

***Keywords*-- Squamous cell carcinoma, nasal cavity, sinonasal malignancy, endoscopic surgery, radiotherapy.**

I. INTRODUCTION

Sinonasal malignancies are rare tumors, accounting for less than 3% of all head and neck cancers and less than 1% of all malignancies worldwide. Among these tumors, squamous cell carcinoma (SCC) is the most common histological subtype, representing approximately 50–70% of sinonasal cancers.

Despite this predominance, SCC of the nasal cavity remains an uncommon entity, and its rarity has limited the development of standardized treatment guidelines based on large prospective studies.

The nasal cavity is anatomically complex and located in close proximity to critical structures such as the orbit, paranasal sinuses, skull base, cranial nerves, and major vascular structures.

Tumors arising in this region often grow silently, producing nonspecific symptoms that mimic benign inflammatory conditions. As a result, diagnosis is frequently delayed, and patients often present with locally advanced disease.

Several etiological factors have been implicated in the pathogenesis of nasal cavity SCC.

Tobacco smoking is a recognized risk factor, although its association is less strong than in other head and neck cancers. Occupational exposure to carcinogens such as wood dust, leather dust, nickel, chromium, formaldehyde, and organic solvents has been consistently associated with sinonasal malignancies.

Viral factors, particularly infection with high-risk human papillomavirus (HPV), have also been suggested to play a role in a subset of cases, though their prognostic significance remains controversial.

Advances in endoscopic surgical techniques, radiotherapy planning, and imaging modalities have improved local control and functional outcomes. Nevertheless, prognosis remains guarded, especially in advanced stages.

This case report aims to contribute to the literature by presenting a detailed clinical case of nasal cavity SCC and reviewing current concepts in diagnosis, treatment, and prognosis.

II. ANATOMICAL AND EPIDEMIOLOGICAL BACKGROUND

The nasal cavity is divided by the nasal septum into two fossae, each consisting of a vestibule and a nasal cavity proper. The vestibule is lined by keratinized stratified squamous epithelium, while the nasal cavity proper is lined by pseudostratified ciliated respiratory epithelium.

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The lateral wall contains the inferior, middle, and superior turbinates, which play a role in airflow regulation and sinus drainage.

The middle meatus is a key anatomical region, as it receives drainage from the maxillary, frontal, and anterior ethmoid sinuses. It is also a frequent site of origin for sinonasal tumors. Lymphatic drainage from the nasal cavity primarily involves the submandibular and upper deep cervical lymph nodes.

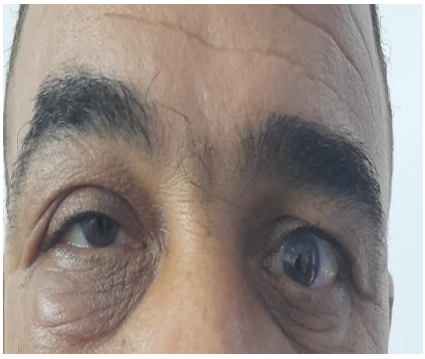
Epidemiologically, nasal cavity SCC shows a male predominance, with a male-to-female ratio ranging from 2:1 to 4:1. The peak incidence occurs between the fifth and seventh decades of life. However, younger patients may be affected, particularly in the absence of occupational exposure. Geographic variations have been reported, reflecting differences in environmental and occupational risk factors.

III. Case Presentation

A 46-year-old male patient with a history of type 2 diabetes mellitus, controlled with oral antidiabetic medication, presented to the otorhinolaryngology department with progressive right-sided nasal obstruction evolving over approximately seven months. The obstruction was initially mild but gradually worsened, eventually becoming persistent.The patient also reported intermittent episodes of mild epistaxis, occurring spontaneously and resolving without intervention. He complained of persistent nasal congestion and a sensation of fullness on the right side. There was no history of facial pain, anosmia, diplopia, headache, weight loss, or systemic symptoms. The patient denied smoking and did not report any known occupational exposure to carcinogenic substances.

IV. Clinical Examination General

Examination revealed a patient in good general condition, with stable vital signs and no signs of systemic disease. Facial inspection showed no asymmetry, swelling, or skin involvement. Anterior rhinoscopy was limited due to obstruction. Flexible nasal endoscopy demonstrated an irregular, friable tissue mass arising from the right middle nasal meatus. The lesion partially obstructed the nasal cavity and bled on contact, raising suspicion of malignancy.(Figure1)

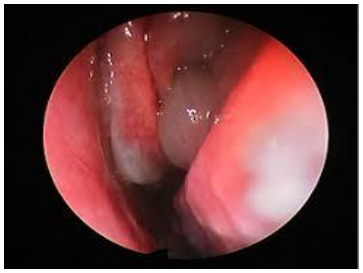


"Figure 1: Right nasal obstruction with visible eyelid swelling"

Nasal endoscopic examination (FND and FNG): Figure 2

- FND: presence of a tissue formation emerging from the middle nasal meatus.
- FNG: normal appearance, no detectable abnormalities.

No palpable cervical lymphadenopathy.



"Figure 2: Nasal endoscopy showing a tissue mass in the right middle nasal meatus."

V. Diagnostic Investigations

Imaging

A contrast-enhanced CT scan of the paranasal sinuses revealed a soft tissue mass occupying the right nasal cavity, with irregular margins and heterogeneous enhancement. No significant bony erosion of the nasal septum or surrounding sinus walls was observed.

MRI was performed to better assess soft tissue involvement. The lesion appeared hypointense on T1-weighted images and hyperintense on T2-weighted images, with intense enhancement following gadolinium administration.

MRI suggested possible infiltration of adjacent soft tissues without orbital or intracranial extension. No definite perineural spread was identified.

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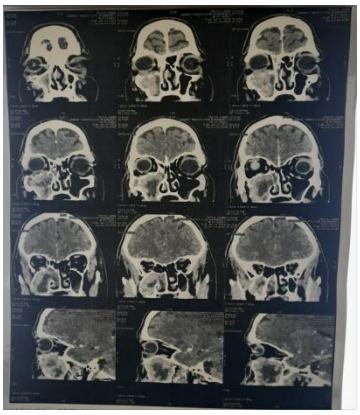
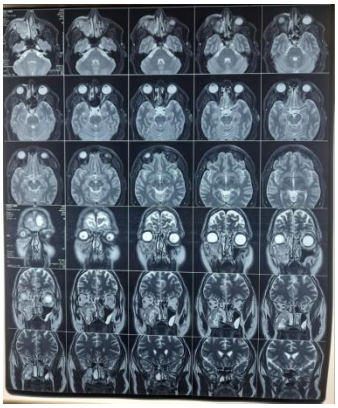




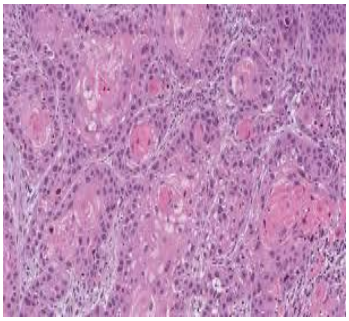
CT scan of the paranasal sinuses (axial and sagittal views, parenchymal window) shows a tumoral process of the right maxillary sinus with intraorbital extension.

Brain MRI reveals a locally invasive lesion of the right maxillary sinus with intraorbital extension, responsible for supero-external exophthalmos.

Histopathology

An endoscopic-guided biopsy was performed.

Histological examination showed malignant epithelial proliferation composed of atypical squamous cells arranged in nests and cords, with intercellular bridges and focal keratinization. These features were consistent with a **moderately differentiated squamous cell carcinoma.**



"Histopathological examination confirmed the diagnosis of squamous cell carcinoma, characterized by a malignant proliferation of atypical squamous cells with stromal invasion."

Staging

Based on clinical and radiological findings, the tumor was staged according to the AJCC 8th edition TNM classification as a localized nasal cavity carcinoma without regional lymph node involvement or distant metastasis.

Therapeutic Management

The case was discussed in a multidisciplinary tumor board involving otorhinolaryngologists, radiologists, pathologists, radiation oncologists, and medical oncologists. Given the localized nature of the tumor and absence of distant spread, surgical management was chosen as the primary treatment.

The patient underwent extended endoscopic surgical resection with the aim of achieving complete tumor removal with clear margins. The procedure was performed under general anesthesia and allowed excellent visualization of the tumor and surrounding structures.

Histopathological analysis of the surgical specimen confirmed complete excision with negative margins. Given the tumor's infiltrative nature and the risk of local recurrence, adjuvant radiotherapy was recommended.

Radiotherapy was delivered using modern conformal techniques to minimize toxicity to surrounding structures. The treatment was well tolerated, with no major acute or late complications.

Follow-Up and Outcome

Postoperative recovery was uneventful. Endoscopic follow-up at one, three, and six months demonstrated good mucosal healing and no evidence of local recurrence. Radiological follow-up with MRI at six months was reassuring.

Functionally, the patient maintained satisfactory nasal breathing and reported no significant impairment in quality of life. Continued long-term follow-up was planned due to the risk of late recurrence.

VI. Discussion

Nasal cavity SCC is a rare but aggressive malignancy characterized by delayed diagnosis and a propensity for local invasion.

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The nonspecific nature of early symptoms often leads to misdiagnosis as benign inflammatory disease, contributing to advanced disease at presentation.

Nasal endoscopy plays a central role in early detection, allowing direct visualization of suspicious lesions and targeted biopsy. Imaging is essential for staging and treatment planning. CT is particularly useful for evaluating bony involvement, while MRI provides superior assessment of soft tissue extension, perineural spread, and skull base involvement.

Surgery remains the cornerstone of treatment for resectable nasal cavity SCC. Advances in endoscopic techniques have enabled complete tumor resection with oncological outcomes comparable to open approaches, while offering improved functional and cosmetic results. Adjuvant radiotherapy improves local control, particularly in tumors with adverse histopathological features.

Chemotherapy is generally reserved for advanced, unresectable, or metastatic disease and may be used concurrently with radiotherapy in selected cases.

Prognosis depends on tumor stage, histological differentiation, margin status, and presence of regional or distant metastases. Early-stage disease has a significantly better prognosis, underscoring the importance of early diagnosis.

VII. Conclusion

Squamous cell carcinoma of the nasal cavity remains a rare but clinically significant malignancy, characterized by insidious onset and nonspecific early symptoms that frequently lead to diagnostic delay. This delay often results in presentation at a more advanced stage, thereby negatively impacting prognosis and therapeutic outcomes. A high index of clinical suspicion is therefore essential, particularly in patients presenting with persistent unilateral nasal obstruction, recurrent epistaxis, or unexplained nasal symptoms that do not respond to conventional medical treatment.

Nasal endoscopy represents a cornerstone in the diagnostic pathway, allowing direct visualization of suspicious lesions and enabling targeted biopsies for histopathological confirmation. Cross-sectional imaging, including computed tomography and magnetic resonance imaging, is indispensable for accurate tumor staging, assessment of local extension, and identification of critical features such as bony erosion, perineural spread, or involvement of adjacent structures. These investigations are fundamental for optimal surgical planning and selection of the most appropriate therapeutic approach.

The management of nasal cavity squamous cell carcinoma requires a multidisciplinary strategy involving otorhinolaryngologists, radiologists, pathologists, radiation oncologists, and medical oncologists. Surgical resection remains the mainstay of treatment for localized disease, with the objective of achieving complete tumor excision and negative surgical margins. The evolution of endoscopic surgical techniques has significantly improved functional and aesthetic outcomes while maintaining oncological efficacy. Adjuvant radiotherapy plays a crucial role in reducing local recurrence, particularly in the presence of adverse histopathological features or locally advanced disease. Systemic therapy is reserved for selected advanced or metastatic cases.

Long-term and rigorous follow-up is mandatory, combining regular endoscopic examinations and radiological assessments to ensure early detection of recurrence and timely intervention. Beyond oncological control, attention should be given to functional rehabilitation and quality of life, as nasal breathing, olfaction, and overall patient well-being are integral components of successful treatment outcomes.

In conclusion, early recognition and comprehensive multidisciplinary management are key determinants of prognosis in squamous cell carcinoma of the nasal cavity. Reporting detailed clinical cases such as this one contributes to increasing clinician awareness, refining diagnostic strategies, and ultimately improving patient outcomes in this rare and challenging malignancy.

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