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Chondrosarcoma of the Nasal Septum: A Case Report and Review of the Literature

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Abstract **Case Report**

Chondrosarcoma involving the nasal septum is an exceptionally uncommon malignant tumor, with only a limited number of cases described in the literature. Sinonasal localization remains particularly rare among head and neck chondrosarcomas. We report the case of a 13-year-old patient presenting with progressive unilateral nasal obstruction associated with recurrent epistaxis and swelling of the nasal root. Computed tomography and magnetic resonance imaging demonstrated an aggressive fronto-ethmoido-nasal mass with skull base and orbital extension. Histopathological and immunohistochemical analyses confirmed the diagnosis of chondrosarcoma. Through this observation, we highlight the major contribution of CT and MRI in lesion characterization, evaluation of locoregional extension, and therapeutic planning.

Keywords: Chondrosarcomam Nasal Septum, Sinonasal Tumor, Magnetic Resonance Imaging, Computed Tomography, Skull Base Tumor.

INTRODUCTION

Chondrosarcoma is a primary malignant cartilaginous tumor characterized by the production of tumoral cartilage without associated osteoid formation. It accounts for approximately 10–20% of malignant bone tumors. Head and neck involvement is uncommon, representing less than 10% of all chondrosarcomas, while localization to the nasal septum remains exceptionally rare.

Clinical manifestations are generally nonspecific and predominantly rhinological, which often delays diagnosis. Imaging plays a crucial role in the diagnostic approach by evaluating local extension and guiding therapeutic management. Definitive diagnosis, however, relies on histopathological examination. The purpose of this report is to describe the clinical and radiological features of this rare entity and to review its diagnostic and therapeutic challenges.

PATIENT AND OBSERVATION

A 13-year-old patient with no significant past medical history presented with a one-year history of progressive left-sided nasal obstruction associated with recurrent low-volume spontaneous epistaxis. The patient also reported progressive swelling of the nasal root and anosmia, without ophthalmological, otological, or neurological symptoms.

Endonasal examination revealed a fleshy mass arising from the nasal septum and extending toward the fronto-ethmoidal recess and turbinate region, associated with destruction of the nasal septum. Oral examination, dental evaluation, cranial nerve assessment, and lymph node examination were unremarkable.

Craniofacial computed tomography demonstrated an aggressive fronto-ethmoido-nasal tissue process responsible for complete destruction of the nasal septum, lysis of the cribriform plate, and endocranial extension. Additional findings included frontal sinus invasion with lysis of its anterior and posterior walls, partial destruction of the papyraceous laminae, and involvement of the nasal bones. No intratumoral calcifications were identified.

Magnetic resonance imaging confirmed the presence of a polylobulated fronto-ethmoido-nasal tumor extending to the skull base and left orbit. The lesion demonstrated T1 hyposignal intensity, heterogeneous T2 hypersignal intensity, diffusion restriction, and heterogeneous enhancement following contrast administration. The mass invaded the meningeal

structures while respecting the cerebral parenchyma and intra-conal orbital fat.

Histopathological examination following biopsy initially suggested a sarcomatous lesion, while immunohistochemical analysis confirmed the diagnosis of chondrosarcoma. Surgical excision was performed; however, resection remained incomplete because of residual tumor involving the orbital wall and skull base.

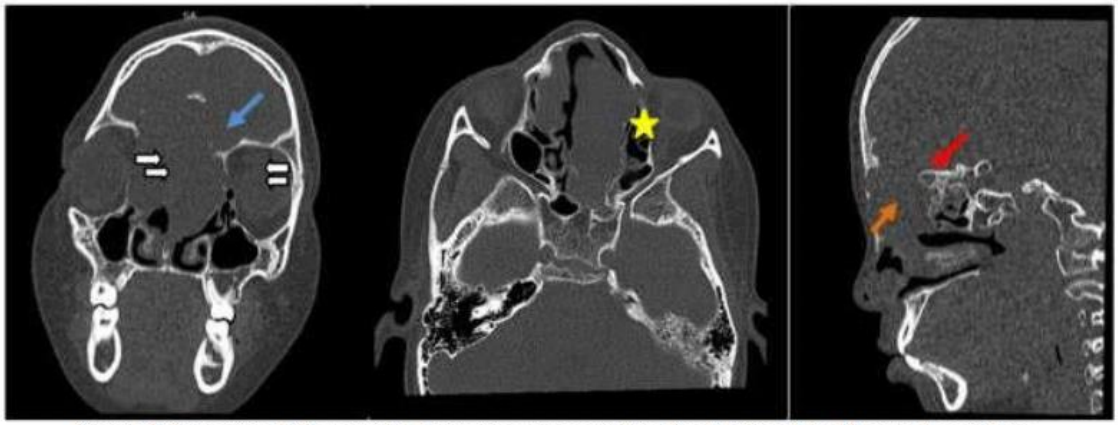

Figure 1: Nasosinus CT scan: the tissue process occupying the fronto-ethmoido-nasal complex:

- Lysis of the cribriform lamina with endocranial extension (red arrow)
- Filling of the frontal sinus with lysis of its anterior and posterior walls (blue arrow)
- Nasal cavity filling with invasion of the upper and middle turbinates, associated with lysis of the nasal septum (Asterisk)
- Partial lysis of right and left papyraceous slides (white arrowhead)
- Partial lysis of the nasal bone (orange arrow)

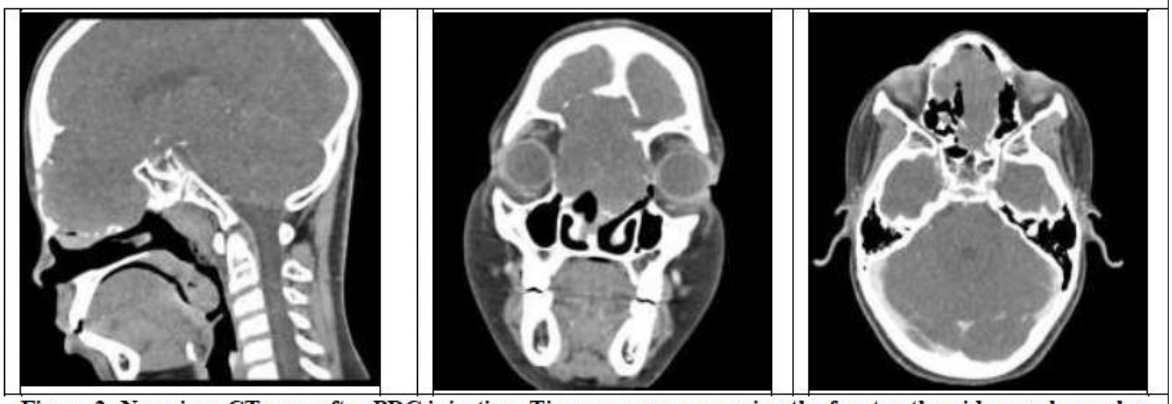

Figure 2: Nasosinus CT scan after PDC injection: Tissue process occupying the fronto-ethmoido-nasal complex, polylobed, iso-dense, slightly enhanced after PDC injection, filling the nasal cavities, frontal sinuses and left sphenoidal sinus and coming into contact with the eyeballs and medial rectus muscles

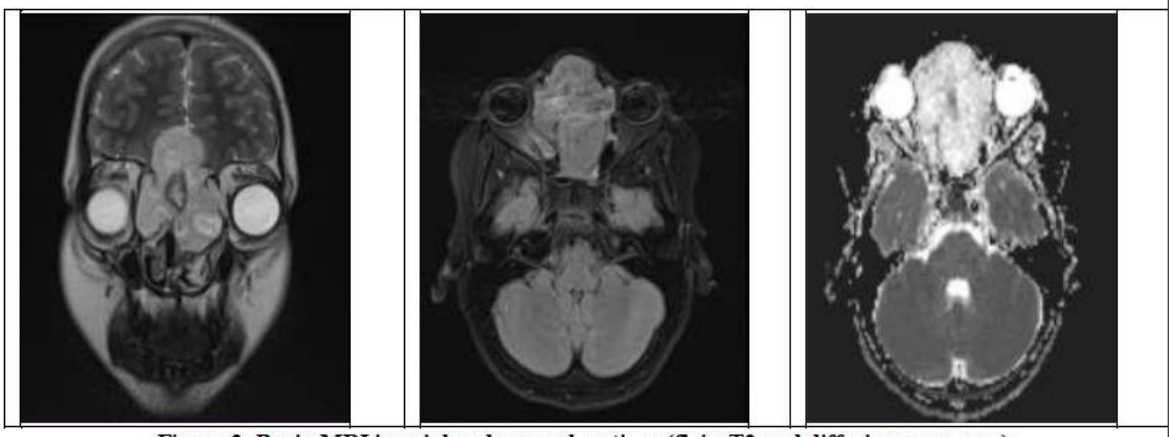

Figure 3: Brain MRI in axial and coronal sections (flair, T2 and diffusion sequences):

Fronto-ethmoido-nasal lesional process with poly-lobed contours, seat of partitions, T1 hypo signal, T2 heterogeneous hyper signal, diffusion hyper signal.

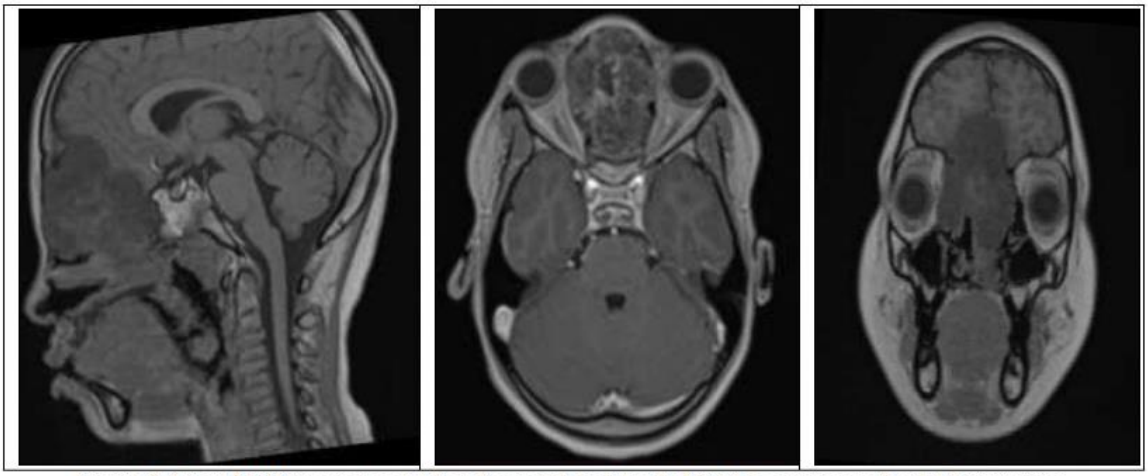

Figure 4: Brain MRI in axial, sagittal and coronal sections in 3D vibe sequences after PDC injection

DISCUSSION

Chondrosarcoma is a rare malignant mesenchymal tumor that develops from cartilaginous tissue. Two main forms have been described: tumors arising from normal cartilaginous structures and those developing from ossified tissues, particularly at the skull base. Localization to the nasal septum remains highly uncommon.

The etiology of chondrosarcoma is not clearly established. However, associations with hereditary multiple exostosis, Ollier disease, Maffucci syndrome, Paget disease, and chondromyxoid fibroma have been reported in the literature.

Clinical presentation is variable and nonspecific. Patients commonly present with unilateral nasal obstruction, epistaxis, chronic sinusitis, rhinorrhea, or facial swelling. More advanced lesions may produce ophthalmological manifestations, headaches, endocranial symptoms, or neurological deficits depending on local extension.

Imaging plays a fundamental role in the evaluation of these tumors. CT scanning is particularly useful for assessing bone destruction and demonstrating the lobulated architecture of the lesion. Chondrosarcomas typically appear as aggressive masses of lower density than bone and may occasionally contain calcifications. MRI provides superior evaluation of soft-tissue extension, orbital invasion, skull base involvement, and meningeal extension. It also contributes to postoperative surveillance by differentiating recurrent tumor from inflammatory or granulomatous tissue.

Definitive diagnosis relies on histopathological examination. Histological grading systems, particularly the FNCLCC classification, are important for prognostic evaluation and assessment of metastatic potential. Differential diagnoses include chondroma, osteoma, fibro-osseous lesions, osteosarcoma, meningioma, and other sinonasal malignancies.

Therapeutic management is primarily surgical. Complete excision remains challenging because of the proximity of critical anatomical structures and the frequent skull base extension of these lesions. Endoscopic approaches may be considered in selected cases. Chondrosarcoma is generally considered poorly radiosensitive, and chemotherapy has demonstrated limited efficacy. Nevertheless, adjuvant radiotherapy may be proposed in incompletely resected tumors or advanced lesions.

The prognosis of sinonasal chondrosarcoma remains guarded. It depends mainly on histological grade, extent of disease, and quality of surgical resection. Local recurrence is frequent, and distant metastases, particularly pulmonary metastases, may occur even late during follow-up.

CONCLUSION

Sinonasal chondrosarcoma is a rare malignant tumor characterized by nonspecific clinical manifestations and locally aggressive behavior. Imaging, particularly CT and MRI, is essential for lesion characterization and assessment of locoregional extension. Histopathological analysis remains mandatory for definitive diagnosis. Surgical excision represents the cornerstone of treatment, although complete resection may be difficult in advanced lesions. Long-term follow-up is necessary because of the high risk of recurrence and metastatic dissemination.

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