Scholars Journal of Medical Case Reports
Abbreviated Key Title: Sch J Med Case Rep
ISSN 2347-9507 (Print) | ISSN 2347-6559 (Online)
Journal homepage: https://saspublishers.com

OPEN ACCESS

Radiology

Maxillary Sinus Osteosarcoma with Orbital and Infratemporal Fossa Extension: A Case Report and CT Imaging Correlation

A. Chaali[1]*, C. Sebti[1], Y. Bouktib[1], A. El Hajjami[1], B. Boutakioute[1], M. Ouali Idrissi[1], N. Cherif Idrissi Gannouni[1]

[1]Radiology Department, AR-RAZI Hospital, CHU Mohamed VI, Marrakech

DOI: https://doi.org/10.36347/sjmcr.2026.v14i11.021 | **Received:** 18.08.2026 | **Accepted:** 14.10.2026 | **Published:** 05.11.2026

***Corresponding author:** A. Chaali
Radiology Department, AR-RAZI Hospital, CHU Mohamed VI, Marrakech

Abstract | **Case Report**

Background: Osteosarcoma of the sinonasal tract and maxillary sinus is an uncommon malignant bone-forming neoplasm. Because its symptoms may be nonspecific and the maxilla permits early extension into adjacent compartments, cross-sectional imaging is essential for diagnosis, local staging, and surgical planning. [1] ***Case presentation:*** A 30-year-old patient presented with a painless right cheek swelling, evolving for two months, with no inflammatory signs. The hemodynamic and respiratory examination was stable, and the initial laboratory assessment was reportedly unremarkable. Contrast-enhanced CT of the facial bones demonstrated a roughly rounded, lobulated, spontaneously isodense mass centered in the right maxillary sinus, containing internal calcifications, and showing heterogeneous enhancement with necrotic areas. The lesion caused extensive osseous destruction and invaded the adjacent cheek soft tissues, anterior and posterolateral walls of the maxillary sinus, medial wall with ipsilateral middle and inferior turbinates, orbital floor, and hard palate/alveolar process. Superiorly, it contacted the lateral orbital wall, lysed the orbital floor, displaced the inferior rectus muscle, and produced grade I right exophthalmos. Posterior extension reached the infratemporal fossa while respecting the intervening fat plane at the temporal muscle. The facial artery remained patent. Surgical excision was performed with a right enucleation, with preservation of the superior rectus muscle. Histopathology established the diagnosis of osteosarcoma. ***Conclusion:*** The combination of an aggressive destructive maxillary sinus mass, internal mineralization, heterogeneous enhancement, necrosis, and multi-compartment extension should raise suspicion for sinonasal osteosarcoma. CT provides a comprehensive map of bone destruction, tumor mineralization, orbital involvement, and surgical relationships. [2]

Keywords: Osteosarcoma; maxillary sinus; sinonasal tumor; computed tomography; orbital invasion; infratemporal fossa; case report.

Copyright © 2026 The Author(s): This is an open-access article distributed under the terms of the Creative Commons Attribution **4.0 International License (CC BY-NC 4.0)** which permits unrestricted use, distribution, and reproduction in any medium for non-commercial use provided the original author and source are credited.

INTRODUCTION

[3–5] Osteosarcoma is a malignant mesenchymal tumor characterized by the production of malignant osteoid by neoplastic cells. Craniofacial osteosarcomas are rare and differ from conventional osteosarcomas of the long bones in their age distribution, clinical presentation, anatomic constraints, and patterns of local spread. Sinonasal osteosarcoma is particularly uncommon, and the maxillary sinus is frequently involved in reported sinonasal series. Symptoms may initially be limited to facial swelling, nasal obstruction, epistaxis, dental symptoms, or nonspecific pain, potentially delaying diagnosis.

Radiologically, these tumors may appear as lytic, sclerotic, or mixed lesions. Tumor-matrix mineralization, cortical destruction, soft-tissue extension, and aggressive periosteal or extraosseous bone formation are important clues, although a classic sunburst pattern is not always present. CT is especially valuable for evaluating mineralization and the complex osseous anatomy of the maxillofacial region, whereas MRI is complementary for marrow, perineural, orbital, and intracranial soft-tissue assessment.

We report a histologically proven osteosarcoma of the right maxillary sinus in a young adult, emphasizing the CT demonstration of extensive local invasion into the orbit, cheek, hard palate, nasal cavity, and infratemporal fossa.

CASE PRESENTATION

Clinical presentation

A 30-year-old patient presented with a painless right cheek swelling of two months. There were no

reported inflammatory signs. The patient was clinically stable from hemodynamic and respiratory perspectives. The initial laboratory work-up was described as normal; without fever or weight loss. No cervical lymphadenopathy was noted.

The extension work-up showed no evidence of secondary lesions or distant metastases.

Imaging technique

A multidetector CT examination of the facial bones was performed with millimetric helical acquisitions before and after intravenous iodinated contrast administration.

CT findings

CT showed a roughly rounded, lobulated mass centered in the right maxillary sinus. The lesion was spontaneously isodense and contained internal calcifications. After contrast administration, it enhanced heterogeneously and included non-enhancing areas interpreted as necrosis.

The lesion demonstrated aggressive multi-directional extension

Superiorly, the lesion contacted the lateral wall of the right orbit and lysed the orbital floor. It infiltrated the extraconal fat and displaced the inferior rectus muscle, with loss of the normal intervening fat plane, and deformation of the orbit. Grade I right exophthalmos was reported.

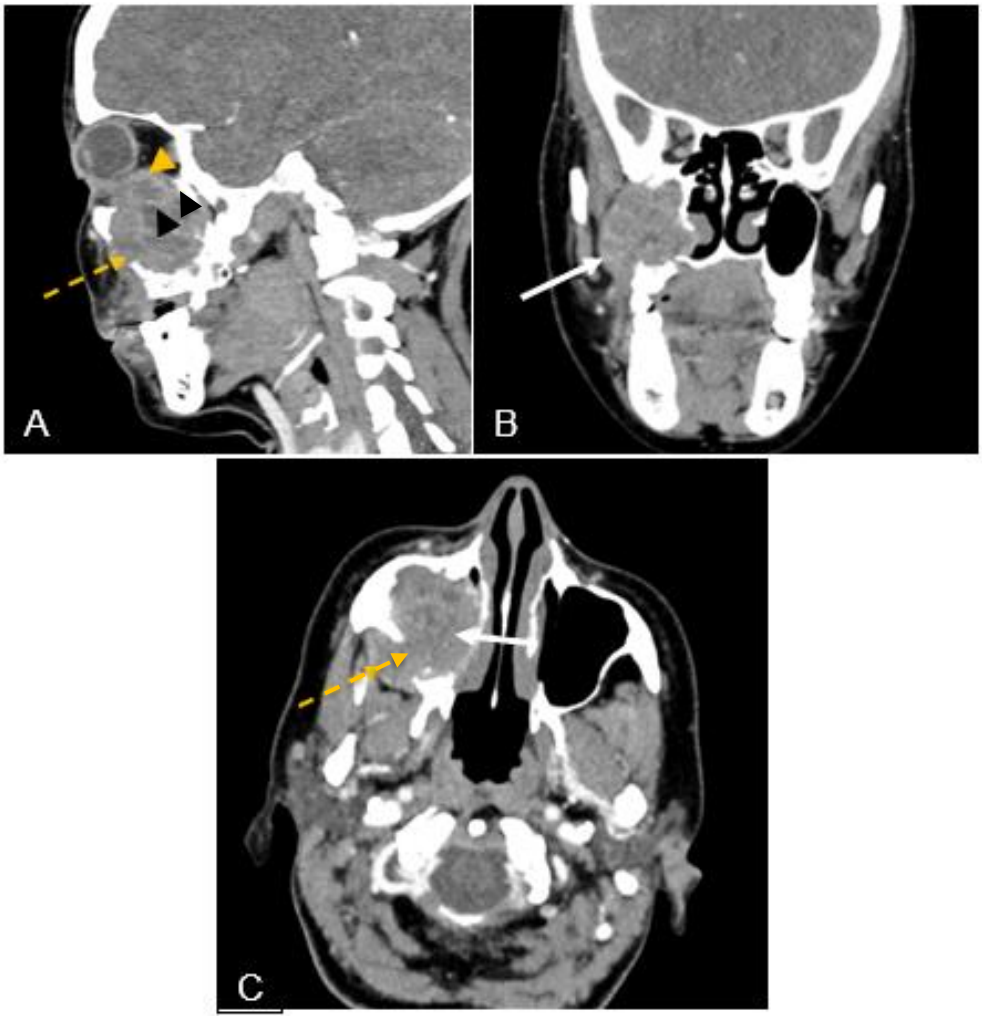


Figure 1: Contrast-enhanced CT images showing a lobulated, heterogeneous lesion [arrow] containing calcifications [black arrowhead] centered on the right maxillary sinus, with osteolysis of the sinus walls [dashed arrow] and superior extension into the orbit [head of arrow], in sagittal [A], coronal [B], and axial [C] planes

Posterolaterally, it destroyed the posterolateral wall and extended into the infratemporal fossa, reaching the ipsilateral temporalis muscle while preserving the intervening fat plane. Medially, it destroyed the medial wall of the maxillary sinus and invaded the ipsilateral middle and inferior turbinates, with bulging toward the anterior ethmoid cells.

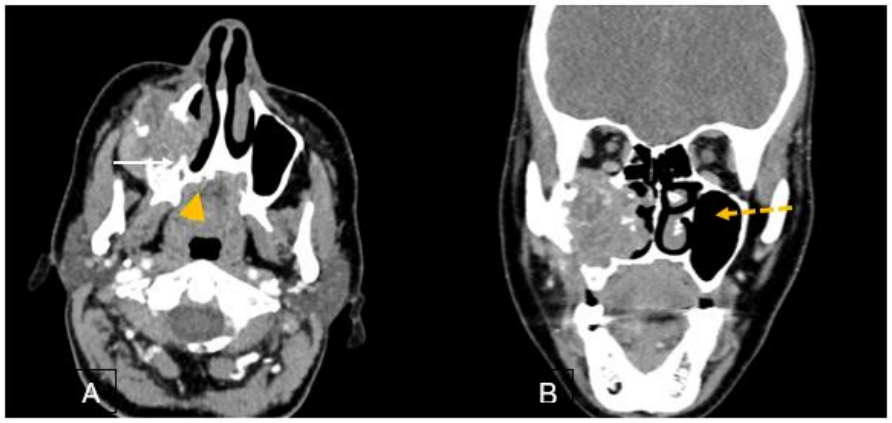


Figure 2: Contrast-enhanced CT images in axial [A] and coronal [B] planes, showing the lobulated lesion centered on the right maxillary sinus, with [A] posterolateral extension into the right infratemporal fossa [arrow], contacting the ipsilateral temporalis muscle while preserving the intervening fat plane [arrowhead]. Medially, [B] the lesion destroys the medial wall of the maxillary sinus and extends into the right inferior nasal turbinate [dashed arrow], with anterior bulging toward the anterior ethmoid cells

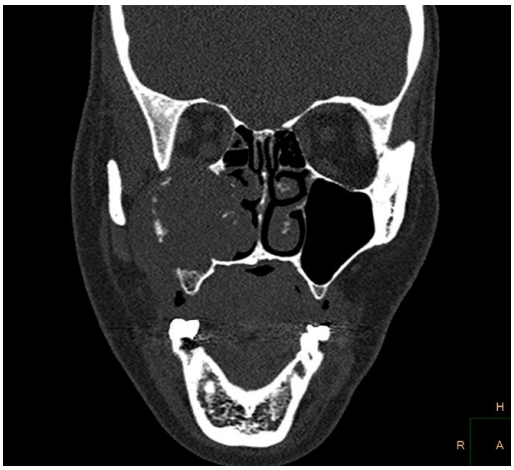


Figure 3: Coronal bone-window CT image in coronal plane demonstrating the aggressive osseous destruction caused by the tumor, with extensive lysis of the walls of the right maxillary sinus [dashed arrow]

Inferiorly, the lesion invaded the bony palate and caused lysis of the right superior alveolar process. Anteriorly, it lysed the anterior wall of the maxillary sinus and extended into the right cheek soft tissues, reaching the facial artery, which remained patent.

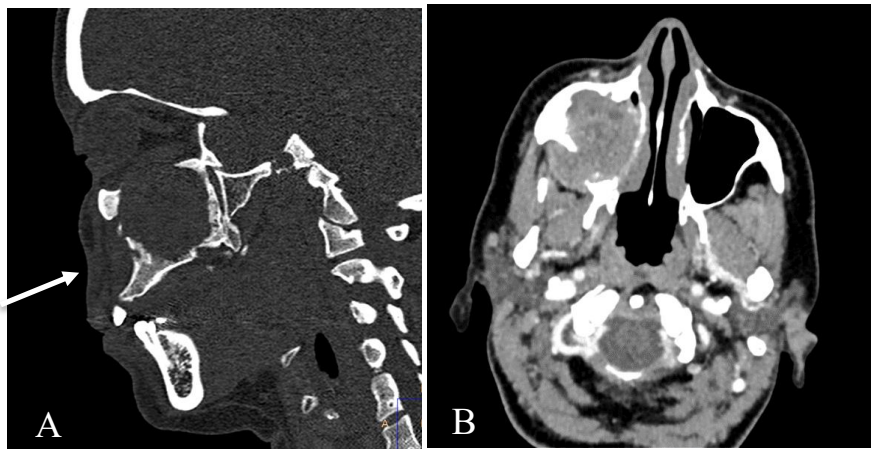


Figure 4: [A] Sagittal bone-window CT image demonstrating invasion of the bony palate with lysis of the right superior alveolar process and lysis of the anterior wall of the right maxillary sinus [white arrows]. [B] Axial soft-tissue-window CT image showing the extension into the adjacent right cheek soft tissues, reaching the facial artery, which remains patent [red arrow]

Treatment and pathology

The patient underwent surgical tumor resection, with the resection margins delineated at 1 cm intraorally and extraorally. A right ocular enucleation was performed through a scleral incision, followed by dissection around the globe with preservation of the superior rectus muscle. The optic pedicle was subsequently skeletonized and ligated.

Histopathological examination revealed a malignant mesenchymal proliferation with osteoid production, morphologically consistent with osteosarcoma. No vascular tumor emboli or perineural invasion was identified. All resection margins of the maxillary bone were free of tumor, with the margins extending through uninvolved tissue.

Following surgical resection with negative margins, the patient underwent adjuvant radiotherapy and chemotherapy.

DISCUSSION

Sinonasal osteosarcoma is a rare entity that can be difficult to recognize clinically because early symptoms overlap with those of inflammatory sinonasal disease and other sinonasal neoplasms. The maxillary sinus is anatomically favorable for silent tumor growth: a lesion can expand within a relatively capacious space before producing external swelling or orbital symptoms. Once the tumor breaches the sinus walls, it can rapidly involve the cheek, nasal cavity, orbit, palate, alveolar process, masticator space, and infratemporal fossa. [3,4,6]

The imaging pattern in this case is highly aggressive. The combination of bone destruction and internal calcifications is particularly important. In craniofacial osteosarcoma, mineralization of the tumor matrix is common but variable; it may be punctate, cloud-like, amorphous, or spiculated. The absence of a classic sunray or sunburst pattern does not exclude the diagnosis. The presence of mineralization within an enhancing soft-tissue mass, particularly when associated with destructive remodeling and extraosseous extension, should prompt consideration of a bone-forming malignancy.[5,7]

CT is the principal modality for defining the osseous epicenter, cortical destruction, tumor mineralization, and the boundaries of surgical resectability. [7] In the present case, CT demonstrated involvement of nearly every wall of the maxillary sinus, extension to the orbit with loss of the fat plane and inferior rectus displacement, and posterior extension into the infratemporal fossa. These findings are clinically relevant because orbital invasion may determine the need for orbital preservation or ablative surgery, while infratemporal extension may complicate achieving adequate margins.

Imaging should be interpreted together with histopathology, as mineralization patterns are not pathognomonic and other entities may produce calcified sinonasal masses. [2]

The differential diagnosis includes sinonasal undifferentiated carcinoma, squamous cell carcinoma, adenoid cystic carcinoma, chondrosarcoma, malignant solitary fibrous tumor, sinonasal sarcomas, calcified fungal disease, and other primary or secondary bone-forming lesions. Chondrosarcoma may demonstrate ring-and-arc chondroid mineralization, whereas osteosarcoma is supported by malignant osteoid production on histology. A definitive diagnosis therefore requires representative biopsy or resection specimens. [8–11]

Craniofacial osteosarcomas are generally managed through a multidisciplinary approach centered on complete surgical resection with negative margins. [9] The roles of chemotherapy and radiotherapy depend on tumor site, grade, resectability, margin status, histologic subtype, and institutional protocols. Because sinonasal osteosarcoma is rare, outcome data are limited and treatment decisions are often individualized. [12]

CONCLUSION

Maxillary sinus osteosarcoma should be considered when a destructive maxillary sinus mass contains internal mineralization and extends across multiple anatomic compartments. In this case, contrast-enhanced CT precisely demonstrated a right maxillary sinus mass with necrosis, calcifications, orbital floor destruction, inferior rectus displacement, cheek extension, hard-palate and alveolar-process invasion, and infratemporal fossa involvement. Recognition of these features is important for prompt biopsy, staging, and multidisciplinary surgical planning.

REFERENCES

1. Lee Y, Van Tassel P, Nauert C, Raymond A, Edeiken J. Craniofacial osteosarcomas: plain film, CT, and MR findings in 46 cases. Am J Roentgenol. 1 juin 1988;150[6]:1397-402. doi:10.2214/ajr.150.6.1397
2. Luo Z, Chen W, Shen X, Qin G, Yuan J, Hu B, *et al.,* Head and neck osteosarcoma: CT and MR imaging features. Dentomaxillofacial Radiol. févr 2020;49[2]:20190202. doi:10.1259/dmfr.20190202
3. Wang S, Shi H, Yu Q. Osteosarcoma of the jaws: demographic and CT imaging features. Dentomaxillofacial Radiol. janv 2012;41[1]:37-42. doi:10.1259/dmfr/86834844
4. Ricotta F, Bassi M, Tomasetti N, Campobassi A, Maiolo V, Bertoni F, *et al.,* Osteosarcoma of the Jaws: A Literature Review. Curr Med Imaging Former Curr Med Imaging Rev. févr 2021;17[2]:225-35. doi:10.2174/1573405616666200806173948

5. Givol N, Buchner A, Taicher S, Kaffe I. Radiological features of osteogenic sarcoma of the jaws. A comparative study of different radiographic modalities. Dentomaxillofacial Radiol. 1 nov 1998;27[6]:313-20. doi:10.1038/sj/dmfr/4600383
6. Shokri A, Ramezani K. Maxillary osteosarcoma: a case report and review of maxillary sinus space-occupying lesions. Braz Dent Sci. 30 sept 2020;23[4]:6p. doi:10.14295/bds.2020.v23i4.2076
7. Razek AAKA. Imaging appearance of bone tumors of the maxillofacial region. World J Radiol. 2011;3[5]:125. doi:10.4329/wjr.v3.i5.125
8. Shah S, Mishra B, Tiwari N, Nikunj A. Osteosarcoma of jaws: Challenges in diagnosis. J Oral Maxillofac Pathol. 2020;24[3]:589. doi:10.4103/jomfp.JOMFP_142_20
9. Dietz MS, Davis LE, Prasad PK, Campbell SR, Reith JD, Olsen MR, *et al.,* Consensus recommendations in the management of jaw [gnathic] osteosarcoma. Cancer. 1 mars 2026;132[5]:e70273. doi:10.1002/cncr.70273
10. Eggesbo HB. Imaging of sinonasal tumours. Cancer Imaging. 2012;12[1]:136-52. doi:10.1102/1470-7330.2012.0015
11. Kim JH, Lee SK. Classification of Chondrosarcoma: From Characteristic to Challenging Imaging Findings. Cancers. 10 mars 2023;15[6]:1703. doi:10.3390/cancers15061703
12. Low CM, Gruszczynski NR, Moore EJ, Price DL, Janus JR, Kasperbauer JL, *et al.,* Sinonasal Osteosarcoma: Report of 14 New Cases and Systematic Review of the Literature. J Neurol Surg Part B Skull Base. juill 2021;82[S 03]:e138-47. doi:10.1055/s-0040-1701221