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

Endocrinology & Diabetology

An Ethmoidal Mass Revealing Primary Hyperparathyroidism - Case Report

Sanae Chakdoufi[1]*, Ouijdane Zamani[2], Amal Moumen[3]

[1]Endocrinology and Diabetology Department, Mohammed V Military Hospital, Faculty of Medicine and Pharmacy, Mohammed V University, Rabat, Morocco
[2]Radiology and Medical Imaging Department, Mohammed V Military Hospital, Faculty of Medicine and Pharmacy, Mohammed V University, Rabat, Morocco
[3]Endocrinology and Diabetology Department, Moulay Ismail Military Hospital, Meknes; Faculty of Medicine and Pharmacy, Sidi Mohamed Ben Abdellah University, Fes, Morocco

DOI: https://doi.org/10.36347/sjmcr.2026.v14i11.037 | **Received:** 18.09.2026 | **Accepted:** 05.11.2026 | **Published:** 09.11.2026

***Corresponding author:** Sanae Chakdoufi
Endocrinology and Diabetology Department, Mohammed V Military Hospital, Faculty of Medicine and Pharmacy, Mohammed V University, Rabat, Morocco

Abstract **Case Report**

Brown tumors are non-neoplastic skeletal lesions associated with hyperparathyroidism. Ethmoidal involvement is rare and may initially present with sinonasal symptoms. A 45-year-old woman presented with left-sided nasal obstruction and frontal headaches lasting six months. Computed tomography demonstrated a 32 × 24 mm expansile osteolytic lesion centered in the left ethmoid air cells. Laboratory investigations revealed hypercalcemia (3.05 mmol/L), hypophosphatemia (0.62 mmol/L), elevated parathyroid hormone (485 pg/mL), and hypercalciuria (11.23 mmol/24 h), with preserved renal function. These findings supported primary hyperparathyroidism. Cervical ultrasonography, computed tomography, and scintigraphy yielded concordant findings suggestive of a large right inferior parathyroid adenoma. The ethmoidal lesion was considered compatible with a brown tumor. Hypercalcemia was controlled with calcitonin and bisphosphonates before minimally invasive right inferior parathyroidectomy. The postoperative course was uneventful. This case emphasizes the importance of assessing calcium and phosphate metabolism and measuring parathyroid hormone when investigating expansile craniofacial bone lesions.

Keywords: Brown tumor; ethmoid bone; primary hyperparathyroidism; parathyroid adenoma; hypercalcemia.

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INTRODUCTION

Brown tumors are focal, non-neoplastic skeletal lesions associated with excessive bone remodeling in hyperparathyroidism. Their fibrovascular and giant cell-rich composition, together with hemorrhage and hemosiderin deposition, can produce an appearance that overlaps with other bone lesions [1]. Recognition therefore depends on correlation between imaging and the biochemical context.

Ethmoidal involvement is rarely reported, although brown tumors of the ethmoidal sinus and skull base have previously been described [2]. Sinonasal symptoms may precede the diagnosis of the underlying endocrine disorder. We report an ethmoidal lesion compatible with a brown tumor that led to the diagnosis of primary hyperparathyroidism associated with a right inferior parathyroid adenoma.

CASE REPORT

A 45-year-old woman with no significant medical history presented with left-sided nasal obstruction and frontal headaches lasting six months. Computed tomography (CT) of the facial bones demonstrated an expansile osteolytic lesion measuring 32 × 24 mm, centered in the left ethmoid air cells (Figures 1 and 2).

Laboratory investigations revealed serum calcium of 3.05 mmol/L, phosphate of 0.62 mmol/L, parathyroid hormone (PTH) of 485 pg/mL, and 24-hour urinary calcium of 11.23 mmol. Renal function was reported as preserved. Hypercalcemia associated with an inappropriately elevated PTH concentration supported the diagnosis of primary hyperparathyroidism. Cervical ultrasonography, cervical CT, and scintigraphy showed concordant findings suggestive of a large right inferior parathyroid adenoma. The skeletal assessment was

reported to show lumbar osteoporosis and osteopenia at the femoral necks.

The combination of an expansile osteolytic ethmoidal lesion and PTH-dependent hypercalcemia supported a diagnosis of brown tumor. Hypercalcemia was controlled with calcitonin and bisphosphonates. The patient subsequently underwent minimally invasive right inferior parathyroidectomy with removal of the adenoma. The immediate postoperative course was uneventful. Detailed postoperative calcium and PTH measurements and serial imaging of the ethmoidal lesion were not available for this report.

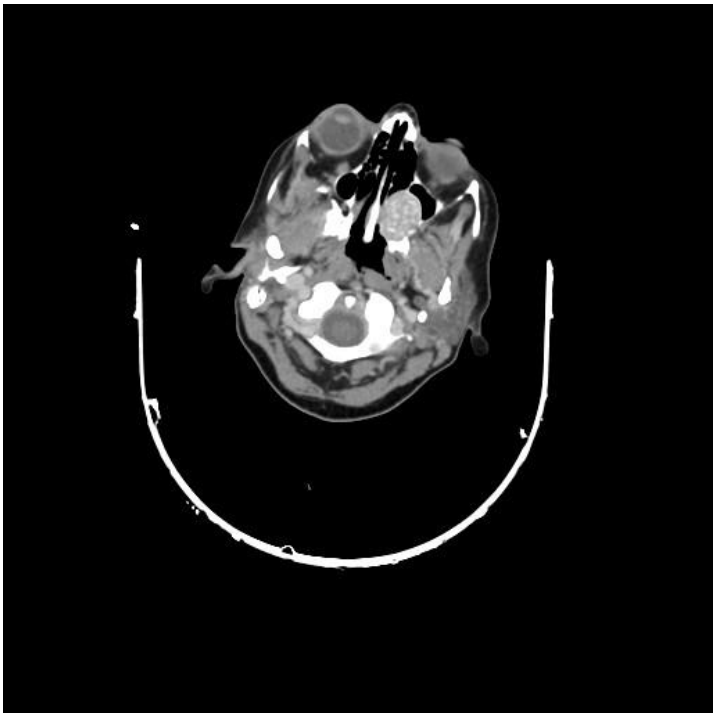


Figure 1. Axial CT image of the facial bones displayed using a soft tissue window, showing the expansile lesion in the left posterior sinonasal region, reported as centered in the left ethmoid air cells. The lesion measured 32 × 24 mm on the complete examination

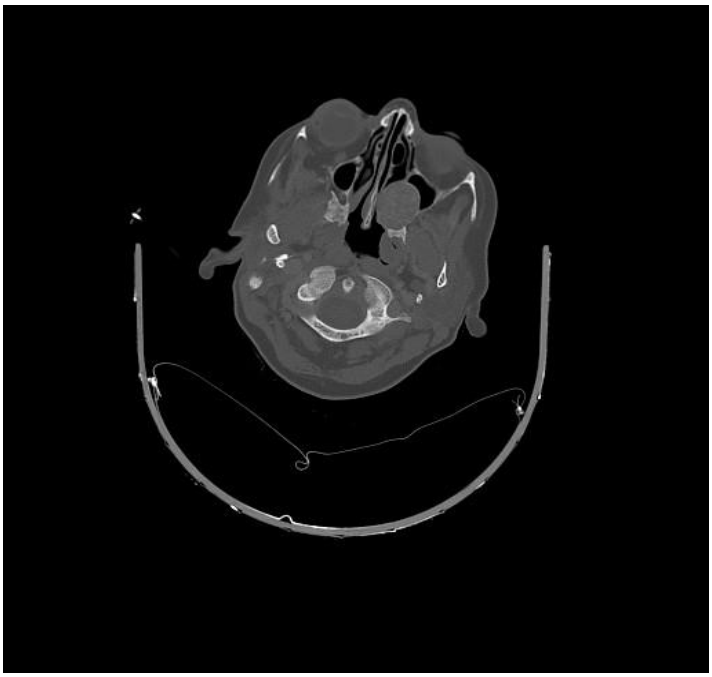


Figure 2. Axial CT image of the facial bones displayed using a bone window, showing the expansile lesion in the left posterior sinonasal region, reported as centered in the left ethmoid air cells. The lesion measured 32 × 24 mm on the complete examination

DISCUSSION

This case illustrates how a focal craniofacial lesion can lead to recognition of an endocrine disorder. The biochemical findings established a PTH-dependent process and supported primary hyperparathyroidism, while concordant cervical imaging localized a probable parathyroid adenoma. This metabolic context provided a plausible explanation for the ethmoidal lesion.

Brown tumors may resemble primary bone lesions on imaging. The differential diagnosis includes giant cell tumor, central giant cell granuloma, aneurysmal bone cyst, and fibro-osseous lesions; malignancy should also be considered when warranted by the imaging findings [1]. Giant cell-rich histology is not independently diagnostic, and tissue findings must be interpreted with calcium and PTH measurements. In this report, the ethmoidal lesion was considered compatible with a brown tumor on the basis of the available biochemical and radiological findings.

The ethmoidal sinus and skull base are uncommon sites, but previously published observations demonstrate that these lesions should be considered in the appropriate endocrine setting [2]. Their clinical importance depends on anatomical relationships and functional consequences. In this patient, nasal obstruction and frontal headaches prompted investigation; detailed orbital or intracranial extension was not documented in the available material.

Treatment addressed the underlying hyperparathyroidism through removal of the right inferior parathyroid adenoma after medical control of hypercalcemia. An uncomplicated postoperative course documents short-term surgical recovery but does not demonstrate resolution of the ethmoidal lesion. Subsequent clinical assessment, biochemical testing, and interval imaging are needed to evaluate the endocrine response and lesion evolution. The lack of detailed postoperative measurements, serial imaging, and a fully characterized histological specimen limits diagnostic certainty and assessment of long-term outcome in this report.

CONCLUSION

An expansile ethmoidal osteolytic lesion may reveal primary hyperparathyroidism. Assessment of serum calcium, phosphate, and PTH helps identify a possible metabolic cause and guides appropriate management. Clinical, biochemical, and radiological follow-up is essential to document the response after treatment of the underlying hyperparathyroidism.

Declarations

Patient consent for publication: Written informed consent was obtained from the patient for publication of this case report and the accompanying anonymized CT images.

Ethics approval: Ethics committee approval was waived for this single-patient case report.

Conflicts of interest: The authors declare that they have no conflicts of interest.

Funding: No funding was received for this study.

Author contributions: Sanae Chakdoufi conceived and coordinated the work, participated in all stages, and drafted and revised the manuscript. Ouijdane Zamani and Amal Moumen contributed to the clinical and scientific work and critically reviewed the manuscript. All authors reviewed and approved the final manuscript and agree to be accountable for its content.

Data availability: Patient-level clinical data are not publicly available to protect patient confidentiality.

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