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Case Report

Chondroblastic Osteosarcoma of the Mandibular Symphysis: A Recurrent Case with Delayed Diagnosis and Metabolic Staging

Elouahab S*, Hafidi S, Lahjaouj M, Loudghiri M, Bijou W, Oukessou Y, Rouadi S, Abada R, Roubal M and Mahtar M

Department of ENT and Head and Neck Surgery, Hospital 20 August, 1953, University Hospital Center Ibn Rochd, Hassan II University, Casablanca 20000, Morocco

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***Corresponding author:** Elouahab Sara, Department of Otorhinolaryngology & Head and Neck Surgery, 20 August 1953 Hospital, Ibn Rochd University Hospital Center, Casablanca, Morocco

ABSTRACT

Osteosarcoma of the oral and maxillofacial region is a rare primary bone malignancy, accounting for less than 1% of all head and neck cancers and approximately 6-10% of all osteosarcomas1,2. Its initial presentation frequently mimics benign odontogenic tumors, reactive osteitis or fibro-osseous conditions, predisposing patients to diagnostic delays and repeated non-oncologic resections3,4. We present the case of a 53-year-old female with a recurrent mandibular symphyseal tumor who underwent six local surgical excisions over a three-year period prior to obtaining a definitive histopathological diagnosis of chondroblastic osteosarcoma5,6. Multiplanar computed tomography (CT) and 18F-FDG PET-CT were essential in characterizing the mixed osteocondensing and osteolytic lesion, establishing local cortical disruption and confirming the absence of systemic metastases (SUVmax 4.1)7,8. This case highlights the critical necessity of comprehensive histological analysis in recurrent jaw lesions and underscores the vital role of advanced functional metabolic imaging in surgical planning and oncologic staging9,10.

Keywords: Osteosarcoma; Chondroblastic subtype; Mandibular symphysis; Local recurrence; PET-CT; Diagnostic delay

Introduction

Osteosarcoma is a primary malignant mesenchymal neoplasm defined by the direct production of osteoid or immature woven bone by malignant stromal cells[1,11]. While long-bone osteosarcomas exhibit a peak incidence in children and young adults during periods of rapid skeletal growth, primary osteosarcomas of the jaw (OJ) demonstrate a distinct clinical, demographic and biological profile[2,12]. OJ typically arises in the third to fifth decades of life (mean age ~40 years) and accounts for 6% to 10% of all primary osteosarcomas[3,13].

Histologically, osteosarcomas are categorized into osteoblastic, chondroblastic and fibroblastic subtypes, with the chondroblastic variant representing up to 50% of head and neck cases[5,14]. The histological presence of extensive chondroid matrix can create major diagnostic dilemmas, particularly on small superficial biopsies where the diagnostic tumor osteoid

may be sparse or absent[6,15]. Consequently, these tumors are frequently misdiagnosed as chondrosarcomas, chondromyxoid fibromas or benign fibro-osseous lesions[4,16]. Repeated marginal enucleations or curettage without clear surgical margins drastically elevate the risk of local recurrence and extensive tissue contamination[7,17]. In this report, we present a rare case of mandibular chondroblastic osteosarcoma with a 3-year history of six local surgical recurrences before definitive histopathological identification, emphasizing radiological-pathological correlation and metabolic staging.

Case Presentation

Clinical history & physical examination

A 53-year-old female was referred to the Department of Otorhinolaryngology and Head and Neck Surgery at Ibn Rochd University Hospital, Casablanca, Morocco, for evaluation and definitive management of a recurrent symphyseal mandibular mass[5].

The patient's clinical history began three years prior to presentation, when she noted a slowly progressive, painless intraoral swelling in the anterior mandible[5]. She initially consulted a dental practitioner and underwent local surgical excision[5]. Over the subsequent 36 months, the patient experienced repeated local recurrences, undergoing a total of six conservative surgical procedures at outside facilities[5]. Unfortunately, previous histopathological reports were unavailable for review[5].

One month prior to her current admission, a re-excision of the recurring lesion was performed[5]. Histopathological evaluation of the surgical specimen (weighing 4 g, with the largest fragment measuring 2 cm) revealed a neoplastic tissue proliferation composed of abundant cartilaginous lobules featuring moderate cellular atypia, binucleated chondrocytes and focal calcifications[5,6]. Crucially, adjacent to the chondroid islands, delicate lace-like malignant osteoid matrix directly deposited by atypical spindle-shaped and hyperchromatic cells with brisk mitotic activity was identified, confirming the diagnosis of conventional chondroblastic osteosarcoma of the mandible[5,14].

Upon physical examination in our department, a firm, polylobulated endoral mass was identified across the mandibular symphyseal region, extending from the lower right central incisor to the lower left central incisor[5]. The mass was stony-hard, non-tender on palpation and firmly fixed to the underlying bone framework[5]. Overlying mucosal surface showed no active ulceration or hemorrhage[5]. Sensory function of the bilateral mental nerves was intact and no regional cervical lymphadenopathy was detected[5].

Radiological & metabolic imaging

Contrast-enhanced maxillofacial computed tomography (CT) demonstrated a mixed osteolytic and osteocondensing expansile lesion centered in the mandibular symphysis with marked destruction of both the anterior and posterior cortical plates[7,8]. Deep facial spaces, floor of the mouth and nasopharyngeal structures were completely uninvolved[5].

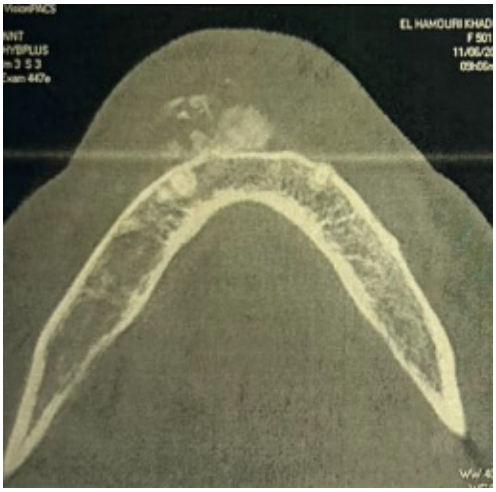

Figure 1A: Axial CT Section of the Mandible.

Axial computed tomography slice demonstrating a mixed osteolytic and osteocondensing symphyseal lesion with significant cortical erosion and moth-eaten bone destruction

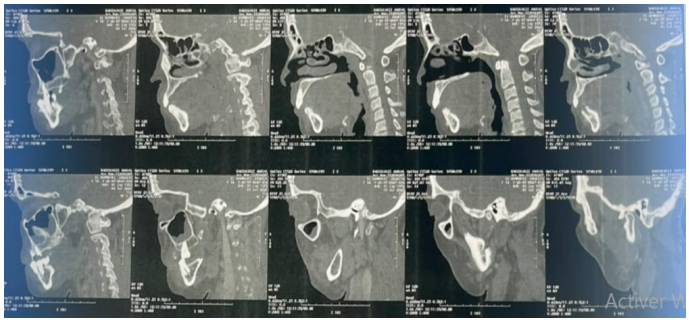

Figure 1B: Sagittal CT Reconstruction.

Sagittal CT view showing the vertical extent of bone erosion, transmural cortical breach and expansion towards the lingual and labial soft tissues.

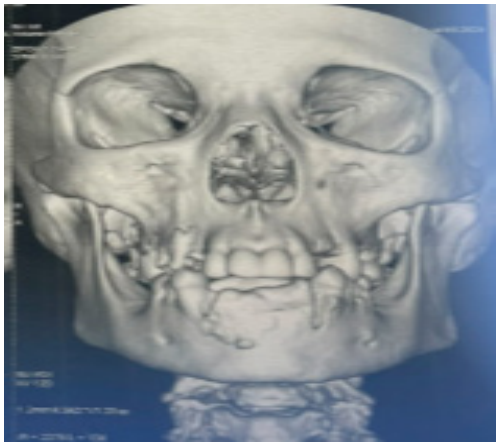

Figure 1C: 3D Volume Rendered CT Reconstruction.

Three-dimensional computed tomography reconstruction providing a spatial depiction of severe symphyseal structural osseous loss and cortical disorganization.

To establish whole-body staging, 18F-fluorodeoxyglucose positron emission tomography combined with computed tomography (18F-FDG PET-CT) was performed[8,18]. The scan demonstrated intense focal hypermetabolism strictly confined to the mandibular symphysis with a maximum standardized uptake value (SUVmax) of 4.1 (background liver SUVmax 3.8), with infiltration into the adjacent gingival soft tissues[8]. No regional

lymph node hypermetabolism or distant metastatic lesions (pulmonary, visceral or skeletal) were identified[8,19].

Definitive surgical management

Following completion of the oncological work-up, the patient underwent segmental mandibulectomy with wide surgical margins. Mandibular continuity was restored using a reconstruction plate. The postoperative course was uneventful and the patient was referred for multidisciplinary oncological follow-up.

Discussion

Osteosarcoma of the jaw (OJ) is a distinct clinicopathological entity that accounts for approximately 1% of head and neck cancers[1,2]. In contrast to extremity osteosarcomas, OJ presents at a later median age (30 to 50 years) and exhibits lower rates of early hematogenous distant metastasis (10-20% vs. 80% in long bones)[2,3]. However, local recurrence represents the primary mode of therapeutic failure and mortality in OJ, heavily influenced by the complex anatomy of the maxillofacial complex which complicates radical en bloc resection with wide negative margins[4,20].

The chondroblastic subtype poses considerable histological challenges[5,15]. The presence of extensive lobular hyaline cartilage can easily mask small focal areas of tumor osteoid, especially when sampling is limited[6,16]. In our case, the patient underwent six local excisions over three years before a definitive diagnosis was established[5]. This underscores the critical necessity of performing wide, representative biopsies and thoroughly sampling cartilage-producing jaw tumors to avoid misdiagnosing them as benign fibro-osseous lesions or low-grade chondrosarcomas[14,17].

Surgical treatment with radical wide surgical margins (R0) remains the gold standard for long-term survival in mandibular osteosarcoma[3,21]. Radical symphysectomy leaves significant functional and aesthetic deficits, requiring complex microvascular reconstruction, such as a vascularized free fibular flap[22,23]. The role of neoadjuvant and adjuvant chemotherapy in OJ remains controversial compared to long-bone osteosarcoma; however, chemotherapy is widely recommended for high-grade tumors, chondroblastic variants or in cases where negative margins cannot be achieved[9,24]. Preoperative 18F-FDG PET-CT plays an increasingly vital role by assessing metabolic activity (SUVmax), defining soft tissue involvement and excluding occult distant metastases prior to major reconstructive procedures[8,25].

Conclusion

Chondroblastic osteosarcoma of the mandibular symphysis is a challenging malignant bone tumor that requires high clinical suspicion and diligent histopathological evaluation. Recurrent jaw lesions should never be managed with repeated conservative curettage without clear tissue diagnosis. Early wide surgical resection with negative margins, guided by advanced CT and 18F-FDG PET-CT imaging, provides the best opportunity for local control and long-term survival.

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