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Case Report

An Eccentric Presentation of Chondroblastoma of the Temporomandibular Joint: A Case Report

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Abstract: Chondroblastoma, a rare tumor, can affect the temporomandibular joint (TMJ) and cause symptoms similar to those of other TMJ problems. Although benign, it has aggressive traits such as bone invasion. A 45-year-old man reported swelling in the left preauricular region for two years. On examination, it was bony hard, not tender, and did not move when the mouth was opened. We diagnosed the patient with pigmented villonodular synovitis based on the radiographic findings. After excision, the histopathological report suggested an uncommon chondroblastoma pathology. Osteolytic tumors of the bone are difficult to diagnose preoperatively owing to their nonspecific clinical and radiographic characteristics. When an osteolytic bony lesion of the temporal bone is present, chondroblastoma should be considered a differential diagnosis.

Keywords: Chondroblastoma; Temporomandibular Joint; Pigmented Villonodular Synovitis; Temporal Bone; Case Report

1. Introduction

Chondrogenic tumors of the temporomandibular joint (TMJ) are rare, with the majority being cancerous rather than benign. These tumors are most commonly found in the epiphysis of the long bones, such as the proximal tibia, proximal humerus, and distal femur, and comprise only 1% of all benign bone cancers [1]. Craniofacial chondroblastoma, which accounts for only 6.4 percent of all chondroblastomas, is more commonly found in the bones of the face and skull [2]. The mandibular condyle has even fewer lesions, with only 14 occurrences of chondroblastoma in the TMJ described in the English literature. Due to the rarity of this tumor, no standardized criteria for identifying it on preoperative imaging have been established [3].

Despite specific preoperative radiographic characteristics, chondroblastoma closely resembles other TMJ malignancies, such as pigmented villonodular synovitis (PVNS), malignant fibrous histiocytoma, aneurysmal bone cyst, chondrosarcoma, osteosarcoma, giant-cell tumor of bone, and eosinophilic granuloma. As a result, the radiographic diagnosis of cancer is difficult, and histological investigation is frequently required for confirmation [4].

2. Case Presentation

A 45-year-old man with no history of trauma reported a slow-growing lump in the left pre-auricular region for two years, which was not accompanied by pain or difficulty opening the mouth. A 4 × 3 cm bony, firm, non-tender, fixed swelling that did not move with mouth opening was observed on clinical examination. The patient provided an informed written agreement to have his photographs published.

MRI revealed a well-circumscribed hypointense lesion in the left masticator space and another similar lesion in the left infratemporal fossa, with posterior connectivity with the TM joint. The imaging characteristics suggest PVNS due to the modest expansion of the left temporomandibular joint space and erosion in the mandibular condyle (Figure 1). CT revealed similar findings as well as spots of calcification in the left masticator space (Figure 2). A Technetium-99m methylene diphosphonate (MDP) bone scan indicated enhanced tracer absorption in the left parietal and temporomandibular areas of the skull (Figure 3).

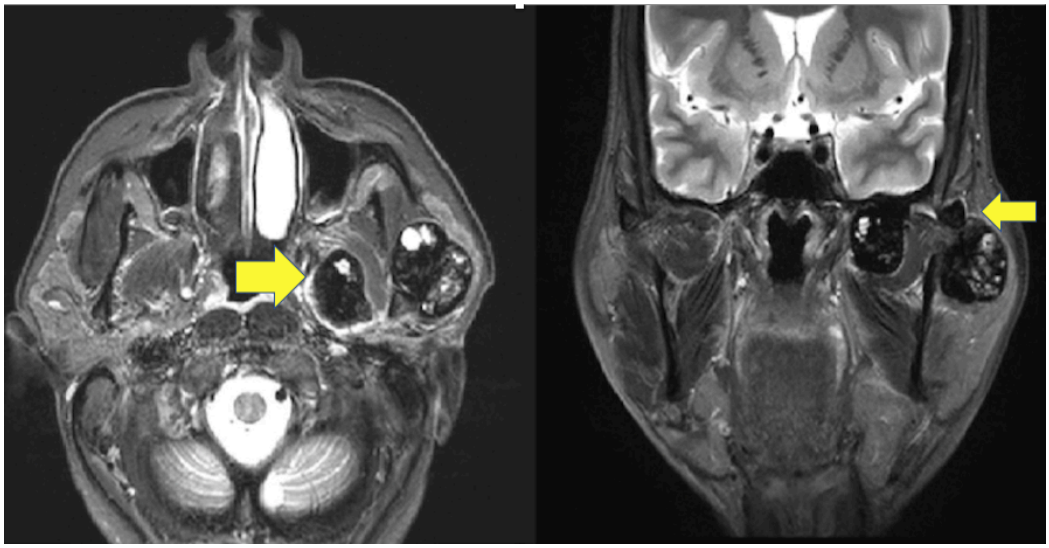

Figure 1. The MRI revealed a well-defined, lobulated lesion with significant T2 hypointensity in the left TMJ space, accompanied by erosion in the mandibular condyle (the yellow arrow indicates the lesion).

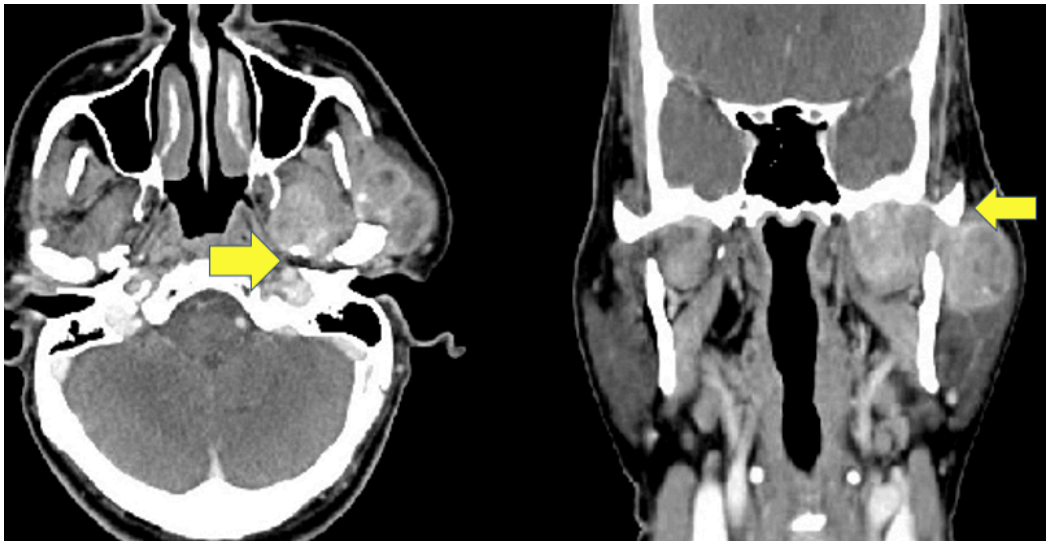

Figure 2. The left TM joint shows amorphous calcifications, a few non-enhancing cystic areas, and focal articular surface erosion with widening of the joint space. (Yellow arrow indicates the lesion).

Figure 3. Bone scan shows increased tracer uptake in the left TMJ regions of the skull.

The fine needle aspiration cytology (FNAC) showed dense polygonal cells with irregularly shaped nuclei and granular chromatin with oncocytic alteration, indicating a neoplasm of osteoclast-like giant cells. Based on the pre-operative diagnosis of PVNS, a transmandibular approach was used to remove a tumor from the temporomandibular joint. During the surgery, a well-encapsulated 5 × 4 cm tumor was found emerging from the left TMJ capsule and extending over the larger wing of the sphenoid bone, with extensive adhesions bordering the foramen spinosum and foramen ovale. (Figure 4A,B) The tumor was completely removed after excising the mandibular condyle, and there were no complications during or after the surgery.

The histopathology results showed that the tumor was largely encapsulated with large cells containing vesicular and eccentric nuclei and a somewhat amphophilic cytoplasm. The histomorphological features of the lesion, which included a hyaline chondroid matrix and areas of calcification, were consistent with a diagnosis of chondroblastoma (Figure 5). Over a two-year follow-up period, there were no instances of local recurrence (Figure 4B).

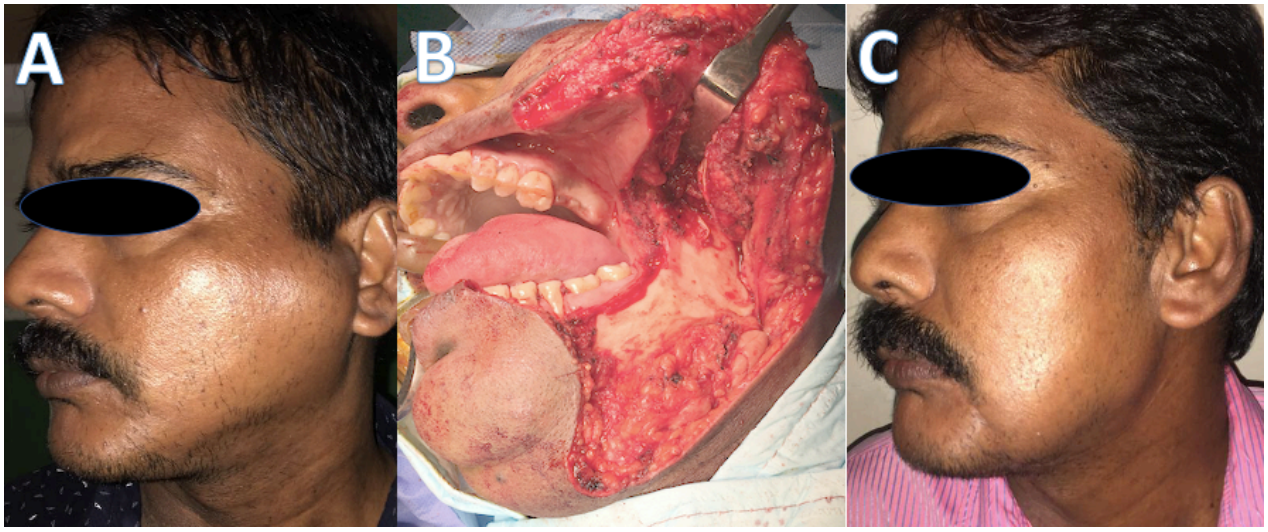

Figure 4. (**A**) Pre-op photograph showing lesion in the left parotid region. (**B**) Intra-op picture showing lesion in the left TMJ. (**C**) Follow-up after 2 years.

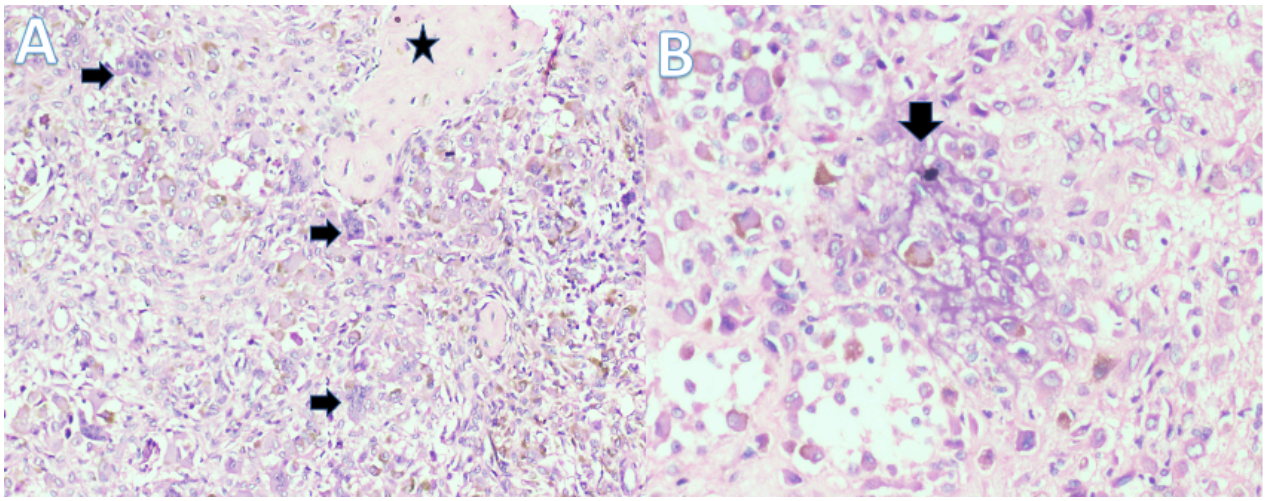

Figure 5. (**A**) H&E 100X showing Hyaline cartilaginous matrix resembling osteoid; Arrow showing Osteoclast giant cells (star). (**B**) 200X, Hyaline matrix with foci of chicken-wire-like calcification surrounding individual chondroblasts (arrow).

3. Discussion

The clinical similarities between chondroblastoma and other common TMJ problems can lead to delayed diagnosis and treatment of extraosseous TMJ involvement. FNAC is not significant for preoperative tumor diagnosis. The anatomical complexity of these lesions and the risk of harm to the facial nerve limit incisional biopsy. In our case, FNAC only revealed large cells, which could be present in several types of lesions [5].

Chondroblastoma shows up as a growing soft tissue tumor inside the bone with internal calcification on a CT scan. Calcification is present in 20–50% of cases. Other characteristics include irregular bone erosion in the temporal bone, zygomatic arch, glenoid fossa, and periosteal response in the periosteum due to resorption and cortical thinning, depending on the extent of the disease [6, 7]. PVNS exhibits areas of high intensity within the lesion with thickened synovium caused by hemosiderin deposition, bone erosion, and sclerosis on CT [8].

Chondroblastoma may appear differently on MRI due to varying enhancement. It is often seen as a mass with a peripheral enhancement that can be either homogeneous or heterogeneously enhancing. T1-weighted images show low signals, while T2-weighted images show high signals. Post-gadolinium enhancement T2 scans may have heterogeneity with areas of significant hyperintensity. The appearance of PVNS on MRI varies due to varying hemosiderin, lipid, fluid, and pannus deposition. Intra-articular locations typically show low signals on both T1 and T2. A high-signal loculated cyst in joint fluid on T2 imaging can also be observed, as well as inconsistent high-signal T1 due to lipid accumulation in foamy macrophages, which closely resembles subcutaneous fat [8].

The radiographic characteristics, such as joint space expansion, bone degradation, and intra-tumoral calcification closely resembled PVNS, leading to a suspicion of PVNS before surgery in the current investigation. Looking back, the calcification in the tumor could have been a more suspicious characteristic of chondroblastoma than PVNS. Both PVNS and chondroblastoma require full surgical excision as a curative alternative. Hatano et al. found that total excision of the lesion was required in their study and that conservative treatment of tumors with curettage alone resulted in a recurrence rate of 55% [9, 10]. Radiation therapy is no longer indicated, even for unresectable tumors, as it increases the risk of developing chondrosarcoma. Malignant degeneration to chondrosarcoma is likely uncommon, but it has been reported previously [2, 10].

The traditional postoperative histological findings, such as an acellular amorphous matrix with chondroblasts and chondroid foci, as well as focal chicken-wire calcification, are not sufficient for making the diagnosis. Therefore, immunohistochemical examination, particularly S-100 positivity, which is associated with the production of chondroid tissue, is necessary for diagnosing chondroblastoma [3, 6]. The presence of S-100 positivity in 90% of chondroblastomas and only 13% of other giant cell tumors has led to the widespread use of S-100 immunoreactivity to differentiate chondroblastoma from other clinical conditions [2, 6, 7].

Diagnosing chondroblastoma based solely on radiological imaging is difficult due to its similarity to other lesions. As a result, surgical excision with histological studies and immunohistochemistry is often necessary for an accurate diagnosis.

4. Conclusions

- Chondroblastoma is a rare benign tumor with aggressive characteristics including bone invasion., that can exhibit symptoms similar to those associated with other TMJ disorders.
- Chondroblastoma closely mimics other tumors of the TMJ, which include pigmented villonodular synovitis (PVNS), malignant fibrous histiocytoma, aneurysmal bone cyst, chondrosarcoma, osteosarcoma, giant-cell tumor of bone, and eosinophilic granuloma.
- On CT scan, internal calcification is present in 20–50% of cases.
- S-100 IHC positivity is associated with the production of chondroid tissue, and is necessary for diagnosing chondroblastoma

5. Patient Perspective

I've recovered nicely from surgery. I lost confidence because I was worried about cancer. The doctors gave me hope and counseled me on the need for tumor removal. My stay in the hospital was pleasant, and the surgery went well. After learning that the tumor was not cancerous, I felt relieved. I was advised to have regular check-ups to detect tumor recurrence. I want to thank the doctors and other healthcare providers for caring for me.

Author Contributions

R.A. and S.M. designed the case report and analyzed the data. R.A. and S.M. reviewed the literature and prepared the manuscript. S.M. edited the final manuscript. All authors approved the final manuscript.

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Informed written consent has been taken from the patient to publish his images.

Data Availability Statement

The data supporting this study's findings are available on request from the corresponding author.

Conflicts of Interest

The authors have no conflict of interest to declare.

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