CASE REPORT

Chondroblastoma of the mandibular condyle:
Case report of an extremely uncommon tumor

Corrado Toro*, Massimo Robiony, Daniele Ferro, Salvatore Sembronio, Nicoletta Zerman, Massimo Politi

Faculty of Medicine, Department of Maxillofacial Surgery, University of Udine, Piazzale S. Maria della Misericordia, 33100 Udine, Italy

Received 28 February 2005; accepted 1 March 2005

Summary
Chondroblastomas typically arise in the bony epiphysis, with a predilection for the distal femur, proximal tibia, or proximal humerus. Chondroblastomas that arise in the skull and facial bones are quite rare, and lesions in the mandibular condyle are even rarer. This case brings the total reported chondroblastoma of the mandibular condyle to nine at the date of submission of this article for publication.

We describe the clinical presentation, radiographic features, differential diagnosis, and treatment for this unusual tumor. The relevant literature on the subject is reviewed, and recommendations for appropriate diagnostic investigation applicable for tumors in this region is presented.

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KEYWORDS
Chondroblastoma; Mandibular condyle

Introduction
Tumors of the temporomandibular joint (TMJ) are rare. Chondrogenic tumors of the mandible are extremely uncommon; further, it has been reported that chondrogenic neoplasms are far more often malignant than they are benign.1

Chondroblastoma was first described in detail in 1931 by Codman2 who reported 9 cases of an entity that he referred to as "giant cell chondromatous tumor of the epiphysis". In 1942, Jaffe and Lichtenstein distinguished chondroblastoma from giant cell tumor, and coined the new term "benign chondroblastoma"; they postulated the possible origin of this tumor from rests of the fetal chondroid skeleton.3

Radiographically, the lesion typically presents as a round-to-ovoid expansive radiolucency. Microscopically, the tumor cells resemble chondroblasts, chondroid foci are frequently observed, and multinucleated giant cells are often present.4 Chondroblastomas typically arise in the bony epiphysis, with a predilection for the distal femur, proximal tibia, or proximal humerus. Chondroblastomas that arise in the skull and facial bones are quite rare,
and lesions in the mandibular condyle are even rarer.\textsuperscript{5,6} Ninety percent of cases occur in the first three decades of life, and there is a predilection for males.\textsuperscript{7} Although a benign tumor, chondroblastoma may exhibit aggressive behavior, with bone infiltration and invasion of articular spaces. Very rarely, there may be distant hematogenous spread of the tumor, with the lung the most common metastatic site.\textsuperscript{8,9}

To our knowledge, at the time of this article submission, 58 documented chondroblastoma involving the temporal bone and 8 involving the mandibular condyle were reported.\textsuperscript{10–18}

**Case report**

In November 2003, a 57 years-old white woman was admitted for evaluation of a swelling in the right TMJ area, which had appeared about 1 year before. The patient was in good health, and there was no history of trauma to the maxillomandibular region. Before the consultation, she had been examined by a dentist, who diagnosed a TMJ disorder and referred her to us for a full diagnostic workup and treatment.

On palpation, a hard subcutaneous swelling was felt in correspondence of the area of the right TMJ (Fig. 1). The swelling was tender and was associated with progressive impairment of the TMJ function.

There was notable right lateral deviation of the mandible on mouth opening. There was a Class II malocclusion. There was slight crepitation noted on auscultation of the left TMJ during mouth opening. The interincisal distance was 30 mm.

CT scans of the cranium showed a round, sharply delineated expanding formation measuring $2 \times 2$ cm, of a solid density, which was expanding laterally from the right condyle (Fig. 2).

Based on clinical data and X-ray results before surgery, several assumptions were made, taking into consideration non-invasive lesions such as chondroma, aneurysmal bone cyst, eosinophilic granuloma as well as frankly malignant lesions such as chondrosarcoma, osteosarcoma, malignant fibrohistiocytoma. Consequently the patient underwent exploratory surgery.

In January 2004, with the patient under general anesthesia, the right TMJ was surgically exposed. A deep sub-fascial approach to the temporo-mandibular joint was used for resection of the tumor.\textsuperscript{19}

This allowed access to the entire region without risk of injury to the frontal branch of the facial nerve.

A neoplasm measuring 2.5 cm. in diameter with a hard-elastic consistency was revealed laterally and in continuity with the right mandibular condyle. The neoplasm had no capsule (Fig. 3).

Frozen tissue examination was interpreted as ‘chondroma without malignancy’. Subsequently, the condyle along with the tumor and the disc were resected. The tumor was apparently separate and distinct relative to the surrounding tissues.

Microscopically (Fig. 4a and b), the neoplastic elements were characterized by chondroid areas exhibiting a relatively acellular amorphous matrix containing occasional round-to-ovoid chondrocytic cells within lacunae, and dense concentration of

**Figure 1** A swelling in correspondence of the area of the right TMJ is obvious.

**Figure 2** A coronal computed tomography showing a mass surrounding the right condyle (arrow).
small chondroblastic-appearing polygonal or round cells in the chondroid foci. Few mitotic figures were observed. Multiloculated giant cells were also seen in some cellular areas. Calcification were not observed.

The overall findings indicated benign chondroblastoma of the mandibular condyle.

After the surgery, the patient was given muscle strengthening exercises. A mandibular flat myalgic splint was constructed for night time wear to reduce any stress which might be produced by night-time clenching and/or bruxing.

At a 1-year follow-up, there was no indication of recurrence (Fig. 5), and TMJ function was satisfactory.

Discussion

Chondroblastoma is a rare neoplasm that represent less than 1% of all bone tumors. In a review of the literature, Blaauw et al. reported 44 cases of chondroblastoma involving the skull, but their references do not distinguish which of these cases were reported previously by other authors. It is therefore possible that some of the cases in their report represented duplicate cases from earlier reports.

There are few reports of chondroblastoma that arise from mandibular condyle. The patient age ranged from 27 to 41 years; this is a relatively higher age than for other regions. The age of our patient is consistent with the pattern found by others authors who have reported chondroblastomas within the skull: cases of intracranial tumours are more frequent in older individuals than tumours of long bones which mostly occur under 20 years of age.

Local pain is the most important symptom of chondroblastoma in the extremities, but in cases of mandibular condyle, restriction of jaw motion or facial swelling is more prominent than pain. In this patient, her complaints included restriction of mouth opening and malocclusion.
Radiographically, chondroblastoma in the extremities tend to appear as sharply delineated, round-to-ovoid radiolucencies with a thin sclerotic margin.\(^{21}\)

Radiographic criteria for chondroblastoma of the TMJ are neither uniform nor clearly defined, probably because of the extreme rarity of this neoplasm.\(^{22}\)

Radiographs of chondroblastoma arising in the mandibular condyle have been reported as resorptive defects or as condylar enlargements associated with thinning of the cortex.\(^{6,10,12}\) Dental panoramic X-ray units project their beams up at approximately 15°. This produces a very distorted oblique view of the relative TMJ anatomy and the mandibular condyle medial pole.

In comparison, the transcranial technique projects its beam down approximately 30° projecting a very distorted oblique view of the relative TMJ anatomy and the mandibular condyle lateral pole.

Initial imaging techniques, such as panoramic mandibular radiography and transcranial radiographs, may not be adequate for detection of tumors such as chondroblastoma and proper treatment planning.\(^{18}\)

The neoplasm is usually small, rarely exceeding 5 cm in diameter. Macroscopically, the tissue is found to be yellowish-grey or brownish, containing haemorrhagic foci, cystic formations, and calcium deposition. Microscopic inspection shows the tumour to consist of polygonal cells with round nuclei. Mitotic figures are rare, and cell membranes are clearly defined. Additionally, there is evidence of a chondroid matrix, and transition from cellular areas into the cartilaginous foci is frequently seen. Small calcified foci are observed in cellular areas of the tumor. Multinucleated giant cells are present either singly or in small groups. In general, mitoses are rarely found, but in some areas they can be quite numerous,\(^{20}\) but are not as numerous as in giant cell tumors.\(^{21,23}\)

Goodsell et al.\(^{10}\) and Milazzo\(^{11}\) described chondroblastomas of the mandibular condyle composed of proliferative fibrous and/or cartilaginous tissues, including multinucleated giant cell. Spahr et al.\(^{13}\) reported a chondroblastoma in which the tumor cells appeared polygonal or spindle shaped and the cellular areas were surrounded by cartilaginous matrix.

The differential diagnosis should include giant cell tumor, chondromyxoid fibroma, chondrosarcoma, and clear cell chondrosarcoma.\(^{24}\)

In the case presented here, there was abundant cartilaginous matrix. The most cellular areas of the tumor resembled island situated between amorphous cartilaginous regions. The cells in the cellular foci appeared round or polygonal. These findings agreed with those of previous reports.

Because multinucleated giant cells are seen in chondroblastosas, the tumor was originally thought to represent a variant of the giant cell tumor.\(^{2}\) However, it has been established that the neoplasm is actually derived from immature chondrogenic cells.\(^{25}\) Nevertheless, the microscopic distinction between chondroblastoma and giant cell tumor is sometimes difficult.

Huvos and Marcove found a higher incidence of recurrence whenever the chondroblastoma was associated with aneurysmal bone cysts.\(^{24}\)

The neoplasm has a benign nature, but it is extremely important to remove every trace of the tumor. This will avoid any dangerous recurrence.

Other reports have described an initial treatment approach with condylectomy and en bloc resection. In these cases, recurrence were not seen.\(^{6,11–13,17}\)

In a previous report of a mandibular condylar chondroblastoma in which the patient was treated with curettage, the tumor recurred 2 years later and the patient had an en bloc resection that included part of the mandibular ramus.\(^{10}\)

In this patient, the head of the condyle, along with the tumor and the disc were resected, with no evidence of recurrence 1 year after surgery.

Before surgery, it is difficult to obtain an incisional biopsy sample of the mandibular condyle, and the diagnostic accuracy of the fine needle aspiration cytologic analysis for mesenchymal lesions is not reliable.\(^{27}\)

The benign nature of chondroblastoma allows for a conservative surgical approach, with complete excision of the neoplasm, and this procedure is usually curative in cases in which tumors are confined to the intrabony compartment. Recurrence usually develops in cases in which the chondroblastoma was extracompartmental at the time of initial diagnosis.

Therefore, we recommend radical surgical removal for suspected chondroblastoma of the mandibular condyle.

We think that periodic clinical and radiographic examination are necessary to reveal any possible recurrence.

References


