



## OSTEOSARCOMA IN THE ANTERIOR REGION OF THE MANDIBLE: A CASE REPORT.

### Dental Science

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### ABSTRACT

**Background** Osteosarcoma is a highly malignant and potentially destructive tumor. It is also the most common primary malignant tumor found in the long bones. Still, osteosarcoma is rare. That most cases of osteosarcoma that can be classified as low-grade develop in the bones of the mandible, indicating that there may also be histological differences between the sites.

**Case Report** An 18-year-old male patient visited a private dentistry office with complaints of increased volume in the region of the mandible. Periapical radiographs were requested. After evaluation, endodontic therapy was indicated for the affected teeth. Endodontic therapy was unsuccessful. Next, pulp vitality testing was performed on the affected teeth, and cone beam computed tomography was requested. This exam allowed for a diagnostic hypothesis of a malignant lesion. Because of this hypothesis, an incisional biopsy was performed, and the histopathological diagnosis was that of low-grade malignant osteosarcoma. The surgical treatment proposed was the partial resection of the anterior region of the mandible with surgical margins around the lesion for subsequent reconstruction. Because of the low grade of malignancy, complementary treatment with radiation therapy or chemotherapy was not indicated. Long-term follow-up care is necessary, with annual scans in the first five years and every two years thereafter.

**Conclusion** An early diagnosis, which was made possible in this case by the adequate interpretation of the imaging scans, enables a more rapid and effective intervention and, as a consequence, better patient outcomes and rehabilitation.

### KEYWORDS

osteosarcoma; mandible; jaw; case report

### INTRODUCTION

Osteosarcoma (OS) is the most common primary malignant neoplasm of bone, occurring more frequently in the long bones and occasionally in the maxillofacial region. Approximately 5% of the OS appear in the maxillary bones, constituting the mandible the most involved site. OS of the jaw usually affects adult individuals, with ages between the 3rd and 4th decades of life, in addition, metastasis is rare and the prognosis is significantly better when compared to its counterpart in long bones. The World Health Organization recognizes several variants that differ in location, clinical behavior and degree of cellular atypia, with conventional or classical osteosarcoma being the most frequent variant, which develops in the bone marrow region and can be subdivided into histological types osteoblastic and chondroblastic, depending on the type of extracellular matrix produced by the tumor cells.[1,2,3]

In this report, an 18-year-old man with a rare case of osteosarcoma in the anterior region of the mandible experienced exponential tumor growth in a brief period of time. This case reflects the need for a precise differential diagnosis so that the ideal treatment may be indicated early.

### CASE REPORT

An 18-year-old male patient visited a private dentistry office with complaints of increased volume in the anterior region of the mandible. The periodontist requested periapical radiographs (Figure 1). After the scans were evaluated, endodontic treatment of teeth numbers 31 to 42 was indicated; no further complementary exams were requested.

The endodontist started the endodontic treatment of tooth number 41 based on the scans and the indication provided, but at the beginning of the procedure, the patient reported extreme pain. The endodontist then decided to suspend the treatment due to the incompatibility between the pain and the radiographic evaluation, which suggested pulp necrosis in the affected teeth. To confirm the diagnosis, a pulp vitality test and cone beam computed tomography (Figure 2) were performed at this point. After the test, pulp vitality was observed in all of the affected teeth, and the cone beam computed tomography revealed a hypodense, irregular, and infiltrative image in the anterior region of the

mandible involving teeth numbers 31, 41, 42, and 43, as well as rotation of teeth numbers 33 and 43. In light of these findings, an incisional biopsy for histopathological evaluation was indicated.

The incisional biopsy was performed by the team of the Oral and Maxillofacial Surgery Department of a Brazilian medical center. The results of the histopathological analysis suggested low-grade malignant osteosarcoma. With these results, the patient was referred to the head and neck surgery team to undergo resection of the lesion with surgical margins (Figure 3).

After undergoing this partial resection of the anterior segment of the mandible, the patient was left with a lateral shortening of the mandibular arch, resulting in a major aesthetic and functional sequela. Correction of this defect was initiated through planning similar to the steps used in orthognathic surgery Reconstruction of the central arch of the mandible was performed through an iliac crest graft and stabilized through the use of mandibular reconstruction plates (Figure 4). A pedicled flap of platysma muscle surrounding the graft was also applied to increase peripheral vascularization, thus increasing the chances of osseo-integration. Due to the lateral narrowing of the central arch of the mandible as a result of the resection surgery, a pedicled tongue graft was necessary to cover the soft tissue. The surgery was successful, and osseo-integration of the graft occurred within 180 days, which resulted in a reshaping of the mandibular arch. The second surgical step consisted of reconstructing the alveolar bone for future dental implants. A new iliac crest graft was attached using transcortical screws. After the osseo-integration period, the patient will therefore be able to receive dental implants and will be biologically and functionally rehabilitated (Figure 5).

### DISCUSSION

Primary osteosarcomas represent a heterogeneous group of malignant tumors of the bone, characterized by a diversity of histological aspects and clinical and biological behavior, being more frequent in the long bones and rare in the jaws.[3,4,5,6]

The age group with the highest OS occurrence of gnathic bones is

usually between the 3rd and 4th decades of life. In this article, we report a case of OS involving a patient of only 18 years of age. Age may be an important parameter in OS differentiation in several anatomical regions and in prognostic predictions. For these authors, patients with more advanced age have a better prognosis, due to the increased resistance to the tumor.[7,8]

Some preexisting an etiological condition may promote the development of OS, such as: previous radiation, fibrous dysplasia, Paget's disease of the bone and local trauma. This may suggest an association between this neoplasm and excessive cellular activity. In the case reported in this study, there was no involvement of any of the predisposing conditions.[9,10,11,12,13]

In the maxillo-mandibular region, most OS are osteoblastic in nature, with a variable quantity of osteoid matrix deposition, with little cytologic atypia and usually consisting of well-differentiated lesions. In the present case, histologically, the tumor was composed of cells now ovate, sometimes fusiform cells that exhibited discrete cellular pleomorphism, responsible for the deposition of extensive areas of osteoid characterizing the osteoblastic type. In a study involving 25 cases of OS, they observed that according to the histological type of the tumor, patients with the chondroblastic variety had a higher survival rate when compared to the osteoblastic type.[14,15,16]

There are differences in the clinical behavior of tumors in maxillary bones that strongly influence the course of the disease, the mode of treatment and the prognosis. Osteosarcomas of the maxillary bones are less aggressive than those of the long bones, as they metastasize rarely and are present in a slightly older age group. In addition, early diagnosis is favored by aesthetic and functional motivations, especially in the maxillofacial region.[17,18]

In a literature review, the 5-year survival rate for primary OS of the maxillary bones ranges from 30 to 40%, with a survival rate of over 80% being reported for patients who underwent radical resection early.[1,9,14,16,17]

OS treatment is well determined in long bones, but remains poorly understood when the condition affects the jaw or jaw. The benefit of long bone OS chemotherapy, leading to a profound change in the disease free survival rate (from 20% in the 1960s to 70% in the 1980s), is noteworthy, but this improvement did not include maxillary OS, since their rarity associated with the lack of standardization of chemotherapy protocols, make it difficult to evaluate the efficacy of adjuvant therapy.[18,19]

In most cases the therapy of choice is radical surgical excision, by providing a 5-year survival rate above 80%. As for chemotherapy, it seems that it has little impact on the survival rates of patients affected by maxillary OS, this is explained by the fact that metastases are rare and late, occurring in only 18% of the cases, and local recurrence of the lesion as the main cause of death. In the case presented in this article, the lesion was diagnosed early, treatment was surgical with total excision of the lesion with safety margin without association with chemotherapy.[15,16,17,18,19]

**CONCLUSION**

Osteosarcoma is an aggressive, rapidly evolving lesion with a tendency toward metastasis and relapse, but early surgical treatment produces a favorable prognosis. In the case reported herein, the initial diagnosis of the biopsy was low-grade malignant osteosarcoma. For this reason, an intrabuccal approach was selected, and the entire tumor plus surgical margins were excised. The patient is currently undergoing implant rehabilitation treatment. He has no reports of pain, and has a good oral opening and no facial asymmetry or major functional issues.

As demonstrated in this study, cone beam computed tomography has the potential to enable early diagnosis of tumor lesions in cases where traditional radiology is limited in the generation of adequate images, especially for lesions in the anterior region of the mandible.

An early diagnosis, which is made possible by an adequate interpretation of imaging scans, enables more rapid and effective intervention and, as a consequence, better patient outcomes and rehabilitation.

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Figure 1. Initial periapical radiographs of inferior incisors.

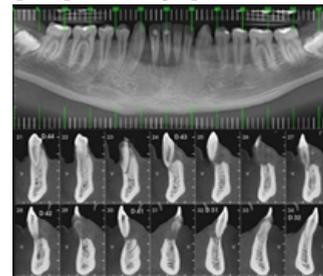


Figure 2. Cone beam computed tomography. Panoramic reconstruction and cross sections.



Figure 3. Surgical specimen resulting from the tumor resection.



Figure 4. 3-D tomographic reconstruction. First stage of surgical rehabilitation.



Figure 5. Follow-up panoramic radiography. Second stage of surgical rehabilitation.

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