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Case Report

Mandibular Osteosarcoma: Clinical Case Report

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Abstract

Osteosarcoma is a malignant tumor of mesenchymal cells that have the ability to produce osteoid matrix or mineralized bone. They can involve any bone, but in the jaw region they are uncommon and account for about 6% of all cases. These tumors present as painful and progressively growing masses. Often a sudden, non-traumatic fracture is the first significant clinical symptom. This paper reports a clinical case of osteosarcoma in the body of the mandible. A 25-year-old male patient came to the clinic reporting an intra and extra-oral swelling in the left lower jaw, associated with pain and paresthesia, which lasted four months. The patient reported a previous history of mucoepidermoid carcinoma in the left retroauricular region treated with parotidectomy when he was six years old. The diagnostic hypotheses of Odontogenic Myxoma and Osteosarcoma were raised. Thus, an incisional biopsy was performed, which showed histopathological examination compatible with osteosarcoma. After that, it was decided to perform a left segmental pelvemandibulectomy with histopathological study that confirmed the diagnosis. The case report contributes to the knowledge of health professionals about the osteosarcoma of the mandible since many times this diagnostic hypothesis is not raised because it is a rare situation.

Keywords: neoplasm; osteosarcoma; mandible; surgery

Introduction

Osteosarcoma is a malignant mesenchymal neoplasm, and the cells of this tumor can produce bone matrix. It is the most common malignant lesion of bone, accounting for about 20% of all sarcomas, however, only about 6% affect the jawbone [7, 9, 10].

This bone neoplasm occurs more frequently in male patients in the third and fourth decades of life, configuring a different age pattern from extragnathic osteosarcoma, which peaks in adolescence and in the sixth decade of life [7].

Although the etiology is unknown, osteosarcoma is related to some risk factors, such as growth spurt, exposure to radiation, alkylating agents, Paget's disease, Li-Fraumeni syndrome, hereditary retinoblastomas and Rothmund-Thompson syndrome [7, 8, 11].

The most common signs and symptoms are pain, swelling - which can cause facial asymmetry - paresthesia, nasal obstruction, and mobility of the teeth. On imaging exams, the lesion will be radiolucent, radiopaque, or mixed, with irregular borders [7, 8, 9]. Radical surgical removal with safety margins is the basis of treatment and may need to be associated with chemotherapy and/or radiotherapy (9). This paper reports a clinical case of osteosarcoma in the mandibular body.

Case Report

A 25-year-old male patient was seen by the oral medicine service, reporting an intra and extra-oral swelling in the left lower jaw associated with pain and paresthesia, with a four-month evolution. The patient reported a previous history of mucoepidermoid carcinoma in the left retroauricular region treated with parotidectomy when he was six years old.

Extraoral examination revealed a bulging of the left mandibular body with facial asymmetry. Intraoral examination revealed an expansile swelling in the vestibular region of the left mandible extending to the bottom of the vestibule with slight fading, an integral mucosa, painful on palpation and associated with paresthesia (Figures 1A and 1B).

On radiographic examination, an ill-defined radiolucent image, without sclerotic border, with erasure of the periodontal ligament corresponding to the left lower first molar (Figure 2).

The diagnostic hypotheses were Odontogenic Myxoma and Osteosarcoma. An incisional biopsy was performed, and the fragment was sent for analysis at the Anatomy Pathology Department, and the histopathological diagnosis was compatible with osteosarcoma (Figure 3A).

The patient was referred to the head and neck surgery service, where he was treated by surgical intervention with left segmental pelvemandibulectomy, cervical emptying and reconstruction with fibula microsurgery. Surgical margins compromised by the neoplasm and final diagnosis of high-grade osteosarcoma with compromised surgical margin and pathological staging pT1N1 (Figure 3B). The patient is in follow-up and will undergo adjuvant treatment with chemotherapy and radiotherapy (Figure 4).

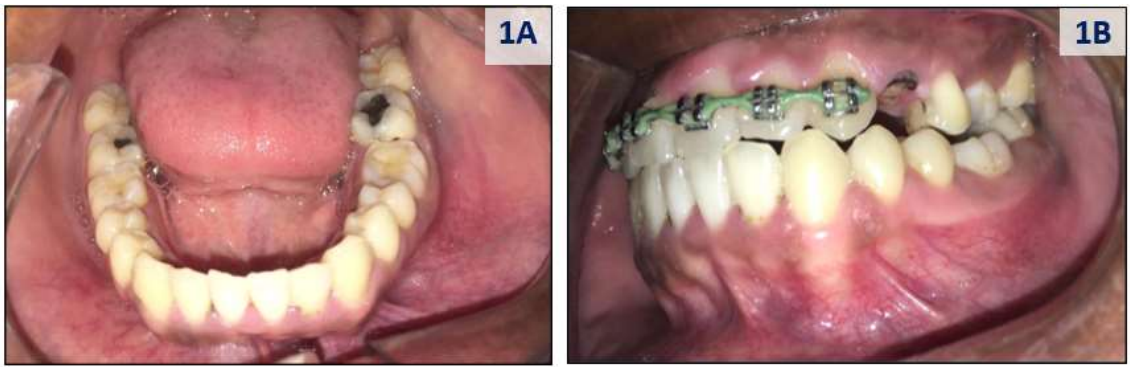

Figure 1 *Clinical features of the lesion: 1A and 1B Intraoral examination - Volume enlargement with erasure of vestibular fundus in body of left mandible.*

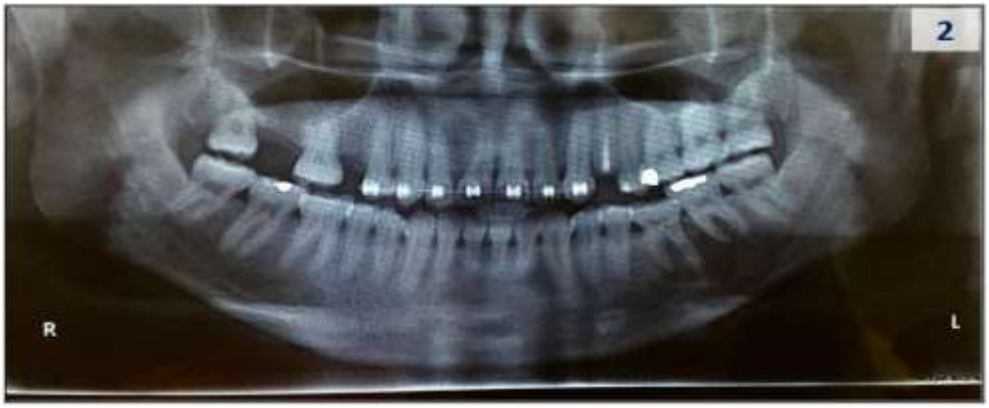

Figure 2 *Panoramic radiograph: Ill-defined radiolucent image without sclerotic border, with erasure of the periodontal ligament corresponding to the left mandibular first molar.*

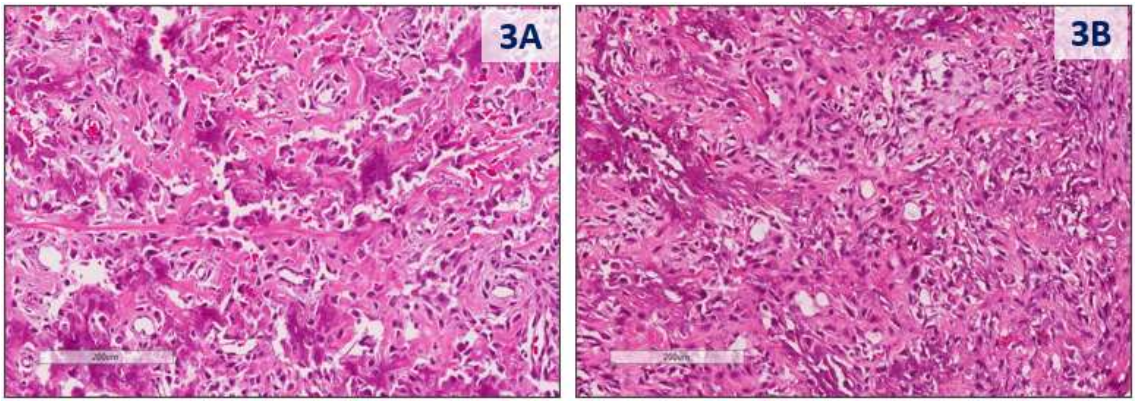

Figure 3: *Histopathological features: 3A Incisional biopsy - Note the direct production of osteoid by malignant mesenchymal cells. 3B surgical specimen - High grade osteosarcoma with compromised surgical margin.*

Figure 4: *Immediate postoperative: After left segmental pelvemandibulectomy, cervical emptying and reconstruction with fibula microsurgery.*

Discussion

Osteosarcoma is the malignant tumor of mesenchymal cells that have the ability to produce osteoid matrix or mineralized bone. This tumor accounts for about 20% of primary bone cancers and occurs in all age groups, with a bimodal age distribution. In general, men are more affected than women (1.6:1) and most tumors arise in the metaphase region of the long bones of the extremities [5, 10].

Osteosarcomas can involve any bone, but in the jaw region they are uncommon and account for 3% to 4% of all cases [3]. These tumors present as painful and progressively growing masses. Often a sudden, non-traumatic fracture is the first significant clinical symptom [1].

Radiographic examinations usually show large, destructive lesions with infiltrative margins and a mixed character with lytic and blastic component [4]. A frequent radiological finding indicative of aggressiveness is Codman's triangle - the tumor can grow so as to rupture the cortex and elevate the periosteum, resulting in the formation of reactive periosteal bone seen in the form of a triangular shadow between the cortex and the raised edges of the periosteum [2].

As for pathogenesis, most osteosarcomas are known to have acquired genetic abnormalities. A predisposing factor that should be emphasized is the increased cell proliferation in the growth plate region of the bone, especially at the time of greatest growth in the adolescent. Molecular studies have shown some mutations in tumor suppressor genes and oncogenes, such as: germline mutations and sporadic abnormalities in *RB* and *TP53* genes, inactivation of INK4a and overexpression of MDM2 and CDK4. Added to these factors, the establishment of carcinogenesis is observed [6].

On macroscopic examination, these tumors appear as bulky, granular, grayish-white tumors with areas of hemorrhage and cystic degeneration. Microscopic examination shows tumor cells varying in size and shape with hyperchromatic nuclei, atypical mitoses, vascular invasion, and areas of necrosis. The bone formation by the tumor cells added to these other characteristics closes the diagnosis of osteosarcoma [6].

As for osteosarcoma of the mandible, surgical removal is the established treatment, when possible, based on hemimandibulectomy or segmental mandibulectomy. Associated adjuvant or neoadjuvant chemotherapy can be performed. The prognosis is more favorable than osteosarcomas of long bones due to a lower incidence of distant metastases [2].

Regarding the case presented, an incisional biopsy was performed that already showed microscopic characteristics of osteosarcoma, followed by a mandibulectomy with subsequent histopathological study of the surgical specimen that confirmed the diagnosis.

Conclusion

Considering the aggressive nature of osteosarcoma, early diagnosis becomes extremely important. The surgical approach is the treatment of choice and association with neoadjuvant or adjuvant treatment may be necessary depending on the location and extent of the tumor.

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