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Case Report

Chondroblastic Osteosarcoma

Dr. Mourai Meryem*, Dr. Kich Ouiam, Prof. loudghiri Meryem, Prof. Bijou Walid, Prof. Oukessou Youssef, Prof. Rouadi Sami, Prof. Abada Reda, Prof. Roubal Mohamed and Prof. Mahtar Mohamed

Department of Otolaryngology, Head and Neck Surgery, Ibn Rochd University Hospital, Faculty of Medicine and Pharmacy, Hassan II University, Casablanca, Morocco

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***Corresponding author:** Dr Mourai Meryem, Department of Otolaryngology, Head and Neck Surgery, Ibn Rochd University Hospital, Faculty of Medicine and Pharmacy, Hassan II University, Casablanca, Morocco

A B S T R A C T

Introduction: Osteosarcomas are potentially lethal primary malignant tumors, more commonly found in long bones than in the maxillofacial region. When they develop in the mandible, their diagnosis and treatment are often delayed, typically 3 to 6 months after the onset of the first symptoms.

Observation: We report the case of a 23-year-old male patient who presented with a large tumor of the left mandible. Radiological findings strongly suggested malignancy. The surgical procedure performed was a hemimandibulectomy. Histological examination of the surgical specimen revealed a tumor proliferation with the presence of atypical osteoblasts and atypical chondroblastic cells, confirming the diagnosis of chondroblastic osteosarcoma.

Discussion: This case illustrates the challenges in establishing an accurate diagnosis, performing appropriate surgical treatment, and managing a mandibular osteosarcoma. Imaging can provide some assistance in diagnosis; however, only histopathological examination offers a reliable diagnosis. The treatment of choice is surgical resection with margins of healthy tissue, which offers a 5-year survival rate of up to 80%. The prognosis for mandibular osteosarcoma is better than for long bone osteosarcomas, but chemotherapy or radiotherapy, which are highly effective for the latter, do not affect the prognosis of mandibular osteosarcoma.

Keywords: Osteosarcomas; Chondroblastic cells; Mandibular osteosarcoma; Chemotherapy and Radiotherapy

Introduction

Osteosarcoma is subdivided into osteoblastic, chondroblastic, and fibroblastic types. Fifty percent are osteoblastic, 17% are fibroblastic, and 33% are chondroblastic. Osteosarcoma of the jaw bones is rare, representing 6 to 9% of all osteosarcomas. It accounts for 6 to 9% of all osteosarcomas and less than 1% of all malignant tumors of the head and neck. Its treatment is primarily surgical, as the effectiveness of chemotherapy and radiotherapy has yet to be demonstrated due to the rarity of this entity. The originality of this clinical case lies in the rarity of this localization.

Observation

A 25-year-old man, with no significant medical history, was referred for the management of a large, rapidly growing left mandibular tumor. The symptoms had appeared only ten months

earlier, with a swelling progressively enlarging in the left mandibular ramus. Subsequently, he developed difficulties with chewing and speaking, accompanied by purulent oral secretions.

Three biopsies were performed, and the last one revealed a left mandibular chondroblastic osteosarcoma. The patient subsequently received six sessions of neoadjuvant chemotherapy.

The examination revealed a patient in good general condition, breathing easily, with a large mass occupying the entire left hemi-mandibular region, approximately 5 cm in its largest axis. The mass was hard, painless, with normal overlying skin, and no oral lesions or pharyngeal involvement. The rest of the examination was unremarkable, with no palpable cervical lymphadenopathy.

Radiological workup included a facial CT scan and parotid MRI **(Figure 1)**. The MRI showed a large necrotic tissue mass centered on the left mandibular ramus, appearing hypointense on T1-weighted images and hyperintense on T2-weighted images after contrast injection, with multiple areas of necrosis.

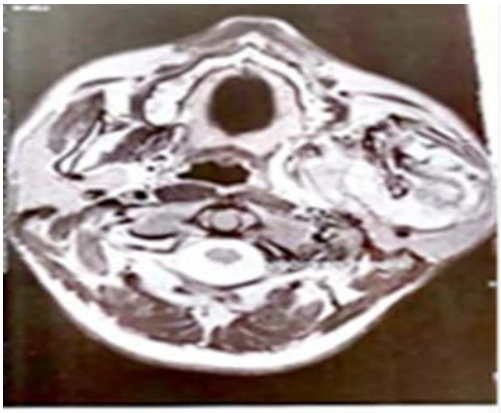

Figure 1: Parotid MRI.

A biopsy confirmed malignancy, showing a malignant mesenchymal proliferation without a vascular component. After ruling out a second site via a CT scan of the chest, an indication for an extended hemimandibulectomy was made **(Figure 2)**. The tumor was approached through a transmandibular buccopharyngectomy. The excision was carried out after a mandibulotomy at healthy tissue levels, including at the symphysis and temporomandibular joint. A 24-hole mini-plate was inserted, and mucosal closure was achieved by simple approximation.

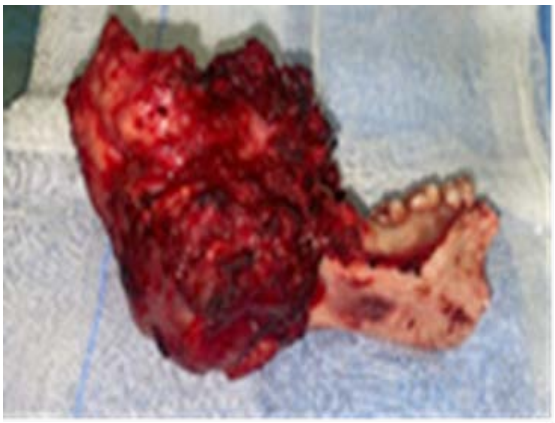

Figure 2: Piece of extended hemimandibulectomy.

Postoperative recovery was uneventful. The patient received a nasogastric tube for 15 days, with dressings changed every two days. Histological examination of the surgical specimen revealed a tumor composed of areas of immature bone with atypical osteoblasts showing nuclear enlargement, as well as hyaline cartilage areas containing atypical chondroblastic cells.

The patient was regularly followed up. After six months, there were no clinical or radiological signs of local recurrence or distant metastasis. Mandibular reconstruction is planned for a later stage with a bone graft.

Discussion

The craniofacial location of osteosarcomas is 6 to 10%, with 40% occurring in the mandible[1-2]. Pedruzzi et al[3]. Performed a retrospective analysis of head and neck osteosarcomas in 2006. They found the age range was between 13 and 66 years, with an average age of 31.5 years. A slight male predominance was noted, with seven male cases (53.5%) and six female cases (46.2%). However, according to Chindia (2001), the age range for osteosarcoma cases is variable, and in our series, the average age was 25 years.

The most common symptom (85-95% of cases) is swelling[4,5]. Radiographic features of osteosarcoma or chondrosarcoma are often difficult to interpret. The lesion is osteolytic in the mandible in 31% of cases, osteoblastic in 46% of cases, and mixed in 23% of cases. Histologically, osteosarcoma resembles sarcomas of the long bones. The presence of osteoid production[5] by malignant cells, even in small quantities, confirms the diagnosis of osteosarcoma. The chondroblastic form typically predominates[6].

The difficulty in establishing treatment guidelines for osteosarcoma is mainly due to its rarity, as it accounts for only 0.5 to 1% of tumors in the facial mass[7]. The consensus for osteosarcoma of the long bones is aggressive surgical resection with clear margins[8,9]. The National Comprehensive Cancer Network (NCCN) guidelines recommend neoadjuvant chemotherapy for all high-grade osteosarcomas of the long bones. However, since osteosarcoma can be of low, medium, or high grade, the role of neoadjuvant chemotherapy remains debated. Some authors suggest that neoadjuvant chemotherapy reduces the tumor size, facilitating negative margin resection[10].

In a retrospective study of 201 patients, Smeele et al. found a statistically significant increase in survival when patients were treated with chemotherapy[11]. Neoadjuvant and/or adjuvant chemotherapy seems to increase the 5-year survival rate from 10-20% to 60%[12]. However, in our patient's case, neoadjuvant chemotherapy did not reduce the tumor. There is very little data explaining the mechanism of chemoresistance in osteosarcoma.

Complete surgical excision with healthy margins is the only effective treatment. The use of preoperative or postoperative adjuvant therapy depends on prognostic factors, but there is no established consensus due to the rarity of this condition[13].

Conclusion

Mandibular localization of chondroblastic osteosarcoma is rare. Carcinological excision improves prognosis but raises the issue of reconstruction, which must ensure both function and aesthetics. The need for adjuvant therapy depends on the type of resection, histological grade, localization, and staging, but there is no prior consensus on this matter.

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