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Case Report

Chondroblastic Osteosarcoma of the Maxilla: A Rare Case Report

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Abstract

Osteosarcoma is a malignancy of mesenchymal cells that have the ability to produce osteoid or immature bone. Chondroblastic osteosarcoma as constitute a substantial proportion of all osteosarcomas of the jaws. Some examples may be composed almost entirely of malignant cartilage growing in lobules with only small foci of direct osteoid production by tumor cells being identified. Chondroblastic osteosarcoma is a rare and aggressive type of bone cancer that tends to occur in the long bones of the arms and legs, although it can happen in any bone in the body. The cause of chondroblastic osteosarcoma is unknown, but it has been linked to specific genetic mutations and environmental factors. It is most common in adolescents and young adults and is characterized by malignant cartilage-forming cells. The prognosis for chondroblastic osteosarcoma depends on several factors, including the size of the tumor and its location, how far it has spread, and the patient's age and general health. Treatment typically involves a combination of surgery, chemotherapy, and radiation. Here, we present a rare case of maxillary chondroblastic sarcoma in a 33-year old woman presenting with a mass in the right quadrant of the maxilla. The lesion is sized as 42*25*30mm and is expanded from the lateral incisor tooth region area to the tuberosity in the anteroposterior dimension, from the alveolar crest to the maxillary sinus.

Keywords

Chondroblastic, Osteosarcoma, Case Report, Maxilla, Oral Cavity, Oral Pathology

1. Introduction

Chondroblastic osteosarcoma is a rare and aggressive type of bone cancer that tends to occur in the long bones of the arms and legs, although it can happen in any bone in the body. It is most common in adolescents and young adults and is characterized by malignant cartilage-forming cells [1, 2]. The disease can spread quickly to other body parts and is often diagnosed late. Treatment typically includes surgery, chemotherapy, and radiation [3].

The cause of chondroblastic osteosarcoma is unknown, but it has been linked to specific genetic mutations and environmental factors. A painless lump or swelling near the affected bone is the most common symptom. Other symptoms may include difficulty moving the affected limb, fever, and fatigue. Diagnosis is typically made through imaging tests such as

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X-rays, computerized tomography (CT) scans, and magnetic resonance imaging.(MRI) scans [4].

The prognosis for chondroblastic osteosarcoma depends on several factors, including the size of the tumor and its location, how far it has spread, and the patient's age and general health. Treatment typically involves a combination of surgery, chemotherapy, and radiation. Surgery is the most common treatment and involves removing the tumor and some surrounding tissue [5]. Chemotherapy and radiation kill any remaining cancer cells and reduce the risk of recurrence.

While the prognosis is often poor, advances in diagnosis and treatment have improved outcomes for patients with this type of cancer [6].

Here, we present a rare case of maxillary chondroblastic sarcoma in a young woman presenting with a mass inside the oral cavity.

2. Case Presentation

A 33-year-old female presented to our clinics with a chief complaint of a rapidly enlarging painful mass within her mouth. The mass first appeared five months ago, with significant enlargement since. In the physical examination, we found an erythematous, tender, firm mass on the right lateral of the hard palate (Figure 1).

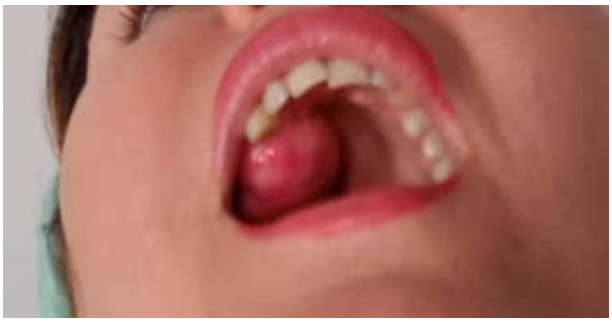

Figure 1. *The patient presented with a large, erythematous mass within the oral cavity.*

We performed cone beam computed tomography (CBCT) of the oral cavity and maxillary sinuses [Figure 2]. CBCT showed an expansile, intraosseous mass with indistinctive borders and a "sun ray" display due to the mixture of radiolucent and radiopaque segments in the right quadrant of the maxilla. The lesion is sized as 42*25*30mm. It is expanded from the lateral incisor tooth region area to the tuberosity in the anteroposterior dimension, from the alveolar crest to the maxillary sinus, and over in the caudal-gingival extent. It had destructed all the adjacent cortices and moved the cortical base of the maxillary sinus. Horizontal bone destruction in the first and second molar teeth region was discovered.

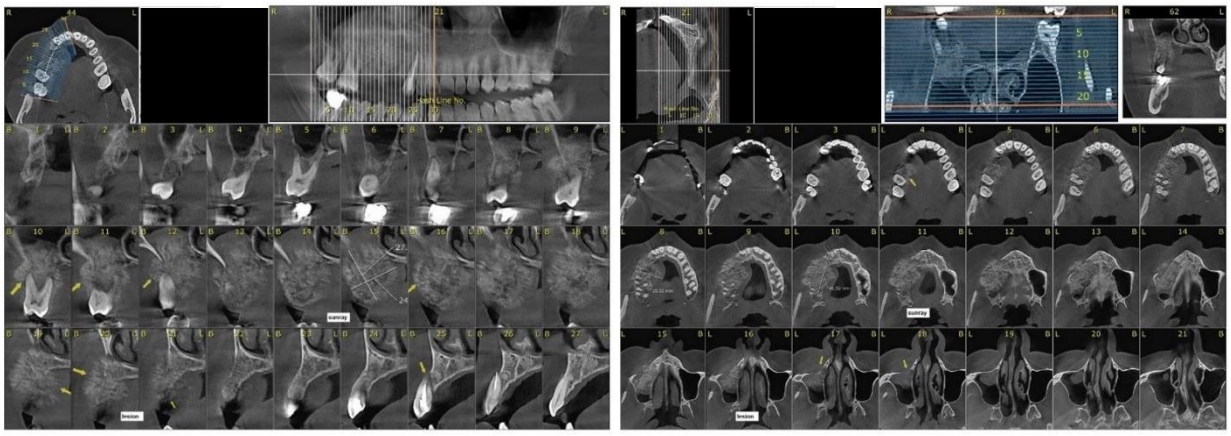

Figure 2. *CBCT findings of the patient.*

The CBCT results suggested the three most critical differential diagnoses; fibrous dysplasia, chondroblastic osteosarcoma, and myxoma.

We further performed an incisional biopsy to evaluate histopathological characteristics [Figure 3]. The biopsy showed a malignant neoplasm of mesenchymal origin, characterized by the presence of irregular bone trabeculae and osteoid amidst discretely atypical chondroblastic cells proliferation at the periphery of mineralized tissue, Hyperchromatic, and pleomorphic fusiform cells are seen.

We performed a complete excision of the lesion. The mass was transferred for histopathologic evaluation, confirming a chondroblastic osteosarcoma diagnosis. No complications occurred immediately after the operation.

On the fourth post-operative day, the patient was discharged in good shape. In the 6-month follow-up, no complications were reported, and no enlargement was seen.

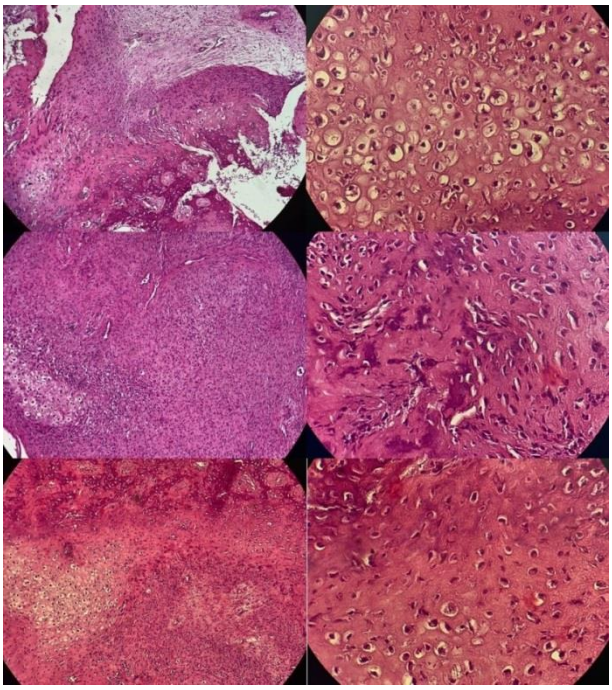

Figure 3. *Histopathological findings of the biopsy of the mass.*

3. Discussion

Osteosarcoma (OS) is a common primary malignant bone tumor type, comprising 40-60% of all cases. While it can occur in various locations in the body, around 10% of osteosarcoma cases appear in the head and neck, with the mandible and maxilla being the most affected areas [7]. The age distribution of extragnathic osteosarcoma is characterized by a bimodal pattern, with most cases occurring in the early years of life and fewer cases in older adults. Osteosarcoma that develops before age 20 or after growth has stopped is often linked to other bone conditions such as Paget's disease, fibrous dysplasia, or previous radiation therapy on the affected bone [8].

Cases of osteosarcoma in the head and neck tend to have a lower rate of spreading to other body parts and a higher survival rate of between 27% and 84% over five years [9]. The maxilla and mandible are affected with similar frequency, with mandibular tumors more commonly found in the back of the jaw and the horizontal branch. In contrast, maxillary tumors are typically located near the bottom of the jaw, the sinus floor, and the palate rather than the upper jaw. The most common symptoms of osteosarcoma are swelling, pain, and other possible symptoms, including facial deformity, loose teeth, tingling, toothaches, bleeding, and nasal blockage [10, 11]. As reported above, our case similarly presented with pain and swelling in the palate.

Osteosarcoma is diagnosed by identifying the presence of osteoid in the bone, a substance produced by the cancerous cells. The type of extracellular matrix present in the tumor can be used to classify osteosarcoma into three subtypes: osteoblastic, chondroblastic, or fibroblastic. However, it can be challenging to distinguish OS from other types of tumors, such as malignant fibrous histiocytomas [12]. Different, less typical kinds of OS include osteogenic, fibroblastic, telangiectatic, low-grade intraosseous, parosteal, and periosteal tumors [11].

The most effective treatment for primary jaw osteosarcoma (OS) is complete tumor removal with clear margins, as we performed in this case. However, achieving clear margins can be challenging, particularly in the upper jaw and at the base of the skull, where rates of positive margins have been reported between 31% and 52.4% [12, 13].

The chondroblastic subtype of osteosarcoma is more prevalent in the jaw, whereas the osteoblastic subtype is more common in long bones, and the latter subtype has a worse prognosis. All these factors may contribute to the difference in the rate of cancer spreading to other body parts [14].

A recent study examined the results of multiple treatments in patients with osteosarcoma in the head and neck area who had positive margins after surgery. The study found that using a combination of surgery and radiation therapy (RT) significantly improved the ability to control the tumor locally compared to using surgery alone [15].

Similarly, Clark et al. suggested that the difference in outcomes between jaw and long-bone osteosarcoma is because jaw osteosarcoma is more commonly the chondroblastic subtype and lower grade. The five-year survival rate for conventional osteosarcoma is 20.3%, while 40% for jaw osteosarcoma. The cancer spreads through the bone marrow and the mandibular dental canal, and tooth extraction may contribute to the spread outside the bone [15]. The most common complication of osteosarcoma is a local recurrence, while distant metastasis is less common. The leading cause of death from osteosarcoma is uncontrolled local spread, while lung metastases and local recurrences are common, and regional lymph node involvement is rare [16].

The two most important factors that determine the outcome of osteosarcoma in the jaw are the size of the tumor and the extent to which it can be removed surgically at the time of diagnosis. The primary treatment for osteosarcoma of the jawbone is wide surgical resection. Still, it can be challenging to achieve clear surgical margins due to the complex jaw anatomy [15, 16]. Completely removing tumors involving the upper jaw is particularly difficult, and the local recurrence rate is higher than tumors in the lower jaw [17].

In a study by Argon et al. on 14 cases of jaw osteosarcoma, they found that early detection and thorough surgical removal can significantly impact the prognosis of the disease. Thus, healthcare professionals and pathologists should be aware of the signs and symptoms of jaw osteosarcoma and the conditions it can be mistaken for to prevent delayed diagnosis [11].

In conclusion, When diagnosing a jaw lesion, clinicians should consider the possibility of both a primary lesion in the jaw or a metastasis from osteosarcoma elsewhere in the body, although the latter is less common. To reach a definitive diagnosis, it is crucial to take a biopsy. Immunohistochemistry,

a laboratory technique that uses antibodies to identify specific proteins, can help confirm a diagnosis of osteosarcoma. An early diagnosis is essential for starting appropriate treatment as soon as possible. Among the histological subtypes, the chondroblastic type is more resistant to treatment. It has a worse prognosis, while the fibroblastic type has a better prognosis as it responds well to treatment.

Abbreviations

CT Scans	Computerized Tomography Scan
MRI	Magnetic Resonance Imaging
CBCT	Cone Beam Computed Tomography
OS	Osteosarcoma

Conflicts of Interest

The authors declare no conflicts of interest.

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