



Benign osteoblastoma of the mandible: a case report

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Abstract (J Korean Assoc Oral Maxillofac Surg 2023;49:49-52)

Osteoblastoma is a rare benign neoplasm formed by osteoid tissue and well-vascularized bone that occurs mainly in children and adolescents. It appears primarily in the long bones, vertebral column, and small bones of the hands and feet, and not typically in the skull and maxillary bones. The purpose of this study is to present the case of an 8-year-old girl with a diagnosis of right mandibular osteoblastoma and a review of the relevant literature. The goals of treatment were to preserve dental occlusion, masticatory function and facial symmetry while minimizing the effects on patient body image and quality of life. Osteoblastoma, although it is benign, can be aggressive, and its treatment will depend on the timing of diagnosis, size and location. Early diagnosis is essential to avoid not only radical surgery as in the case presented, but also to help minimize the risk of possible relapse and potential malignancy of a benign osteoblastoma.

Key words: Osteoblastoma, Mandibular neoplasms, Bone neoplasms, Bone tissue, Mandible

[paper submitted 2021. 10. 5 / revised 1st 2021. 12. 6, 2nd 2021. 12. 14 / accepted 2021. 12. 20]

I. Introduction

Osteoblastoma is a rare benign tumor¹⁻¹⁵ formed by osteoid tissue and well-vascularized bone^{1-3,5,9,10}. It occurs mainly in the long bones, spinal column¹⁻¹⁶, and the small bones of the hands and feet^{2-5,7,8,10-12,14,16}, but not usually in the skull^{2,5-14} and maxillary bones^{2,5-8,12}, when this occurs the mandible is the most affected^{3,5,7,8,10,11,13,14}. It appears in children and adolescents, although it is also reported in patients older than 70 years^{2-5,7,10,13-15}. Mostly it is diagnosed in the second and third decades of life^{2,10,14,16}. The prevalence according to gender is higher in males^{10-14,16}.

The case presented was about a girl with the diagnosis of right mandibular osteoblastoma and the treatment made after removal of the tumor.

II. Case Report

A young girl aged 8 years and 8 months was referred to the Hospital Nacional de Niños Dr. Carlos Sáenz Herrera, Caja Costarricense de Seguro Social (San José, Costa Rica) for facial asymmetry resulting from over 1-year history of osteolytic tumor in the right mandibular region. At the clinical examination, a volume increase was observed in the right side of the face, specifically in the mandibular ramus region, which on palpation corresponded to a firm, hard, non-painful mass. The oral opening was 34 mm with a slight deviation to the right. Antero-posterior radiography of the skull, orthopantomography, and computed axial tomography showed a transversely expansive osteolytic lesion ranging from the condyle of the right mandibular ramus to the first permanent right lower first molar.(Fig. 1) Histological findings after incisional biopsy indicated osteoblastoma. The treatment was the tumor removal by block resection that included condyle and right coronoid to mesial of the first lower right molar, finding, in the surgery, the perforation of the cortical of the mandibular ramus. Reconstruction was carried out immediately using a silicon spacer with the anatomical shape of the mandibular ramus, condyle and coronoid, which was fixed with osteosynthesis material in the mandibular body.(Fig. 2) During this procedure, bone marrow biopsy was performed, and no signs

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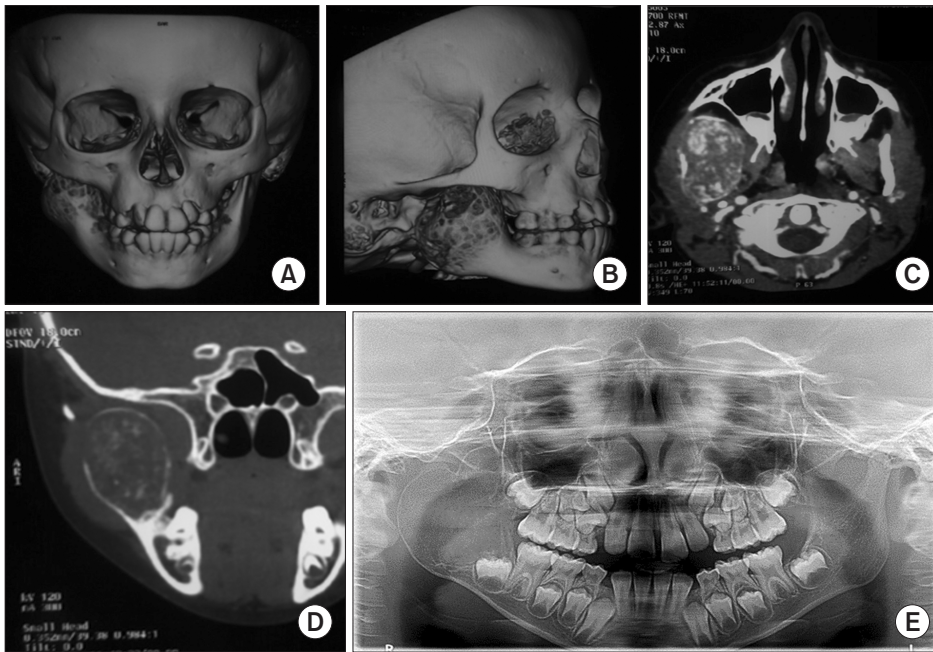


Fig. 1. Right mandibular ramus osteoblastoma, extending from condyle and coronoid process to permanent lower right first molar: computed axial tomography (A and B: 3D reconstruction images, C: axial image, D: coronal image) and orthopantomography (E).
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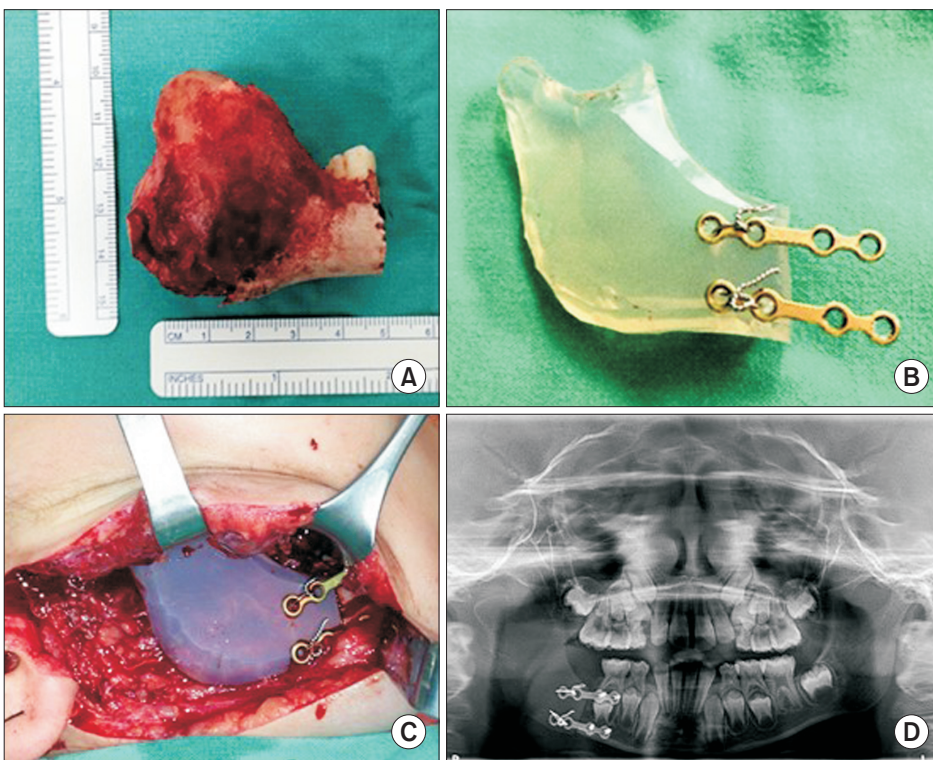


Fig. 2. Right mandibular ramus osteoblastoma. A. Tumor. B. Silicon spacer for reconstruction of right mandibular ramus. C. Silicon spacer positioned and fixed in mandible. D. Immediate postoperative radiographic control by orthopantomography.
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of neoplasia were observed on histopathology. Excisional biopsy of the mandibular tumor specimen indicated that it was composed of fibrous tissue arranged in woven bundles in some areas; at other sites the fibrovascular tissue was loose and there was a trabeculated matrix of mineralized osteoid tissue, and interlaced, irregularly-shaped bone trabeculae presenting as an osteoblastic ridge with rounded osteoblasts;

furthermore, extravasation of erythrocytes and giant cells was observed in other areas, confirming the diagnosis of osteoblastoma. The resection margins were clear, indicating that removal of the tumor was complete.

The patient has not experienced recurrence more than nine years after the surgery.(Fig. 3) Dental occlusion and masticatory function with minimal facial asymmetry were main-

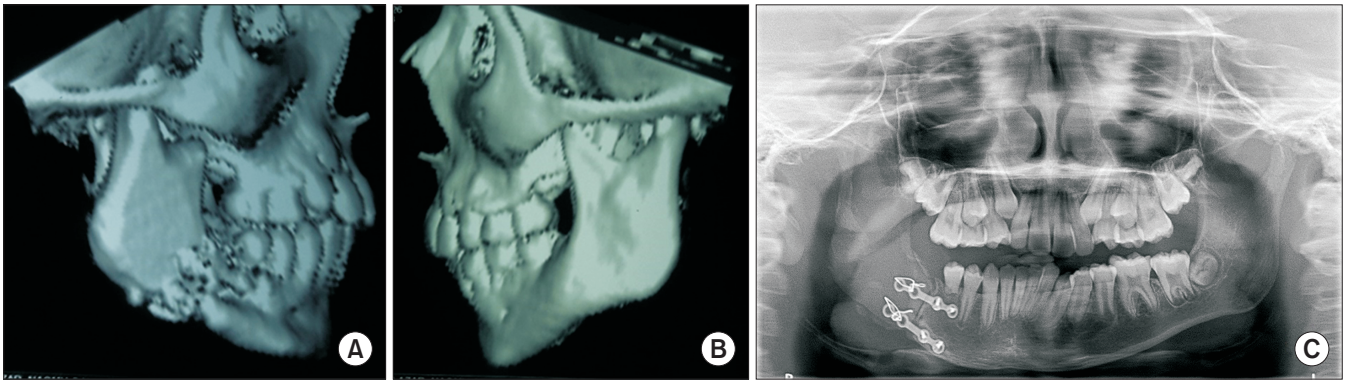


Fig. 3. Patient monitoring images: computed axial tomography (A and B: 3D reconstruction images), two years postoperative, and orthopantomography (C), three years postoperative. Note on the radiograph, the right lower second premolar tooth, which erupted despite the absence of root formation.

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tained, and her body image and quality of life have not been significantly affected.

III. Discussion

Osteoblastoma in the maxillofacial region accounts for 1% of primary bone tumors^{1-3,5-10,13-16} and 3% of all benign bone neoplasms¹⁰. There are two clinicopathological forms of osteoblastoma:

- Benign: characterized by slow growth, well-defined and vascularized sclerotic margins, with slight inflammatory response, and a size less than or equal to 4 cm^{2,7,8,11,12};
- Aggressive: characterized by aggressive local behavior^{2,7,10}, a diameter larger than 4 cm^{7,12} and frequent recurrence (10%-21%)^{2,7,10}, but not metastasis⁷; lesions grow rapidly, tend to invade adjacent tissues¹⁰, and exhibit atypical histopathological characteristics, making differentiation from low-grade osteosarcoma difficult^{2,7,10,11}.

In the present case, osteoblastoma was diagnosed in an 8-year-old girl. The tumor's aggressive behavior, as can be seen in Fig. 1, implies that the lesion had been present for a long time. Furthermore, the present case is diagnosed in a girl, which does not coincide with the predominant gender of this pathology cases.

The diagnosis of osteoblastoma is a challenge^{1,2,7,15}, due to the clinical, radiological and histological similarities with osteoid osteoma^{1,2,5-7,10,12,13}, fibrous lesions^{2,7,10-14}, and osteosarcoma^{2,3,5-7,10,12-14,16}, among other lesions.

According to the literature, this type of pathology can present symptomatically^{1-3,5-8,10,13,14}, but it can also be discovered incidentally on routine examination due to facial asymmetry as a consequence of the increase in tissue volume^{5,8,10,11,13-15}.

Approximately 7.2% to 50% of osteoblastoma cases are asymptomatic¹⁰, as was our case. Osteoblastoma has variable characteristics on radiography with a variety of patterns^{10,15}. These lesions can present in radiographs lytic or mixed images or even sclerotic masses¹⁰. The radiographic characteristics vary according to the size of the tumor and the intensity of the calcification^{2,6-9,14,15}, and it is identified by well-defined edges^{2,6,8,9,16} so expansion of the cortical bones^{2,9,15}, which is observed in Fig. 1.

Histologically, osteoblastomas exhibit well-vascularized, osteoblastic connective tissue stroma and sometimes osteoclasts along with osteoid tissue and varying degrees of calcification, as well as immature bone^{2,8-11,13-15}.

The etiopathogenesis of this lesion remains controversial. This lesion may represent a true osteoblastic-derived neoplasm^{2,13,15} as well as resulting from trauma, inflammation, abnormal local tissue response, or local alterations in bone physiology^{2,11,13,15}.

Differential diagnosis of osteoblastoma includes a variety of benign to malignant tumors^{8,9}, such as cementoblastoma^{5,8,9,12-16}, osteoid osteoma, fibrous dysplasia, ossifying fibroma^{5,8,12,14-16}, focal cemento-osseous dysplasia, and low-degree osteosarcoma^{5,8,12,14-16}.

The treatment of choice is surgical excision^{2,6-9,13,14}, either curettage^{2,3,5,9,12-14} or en bloc resection^{2-4,8-10,12-14,16}, depending on tumor size, site, extent of radiographic involvement and biological behavior¹². In the present case, en bloc resection and reconstruction was performed with an anatomically-shaped silicon spacer to achieve not only facial symmetry, and not affect its psychological condition and self-image, but also to normal function, taking into consideration that the patient was in the process of growth. It is worth mentioning that

reconstruction is important to avoid functional problems^{4,8}; the technique was complex in this case not only because of mandibular bone defects but also because of the involvement of the condyle, but function and quality of life were maintained without.

The possibility of recurrence^{2-4,7-9,11,12,14,16} and the potential for malignancy^{2-4,7,14,16} should be considered in treatment, including regular monitoring^{2,3,7}. Recurrence was not observed in this case over a follow-up of more than 9 years.

In conclusion, osteoblastoma, despite being a benign tumor, can be aggressive, and its treatment will depend on early diagnosis, size and location. Early diagnosis is essential to avoid not only radical surgery, but also to minimize the risk of possible relapse and potential malignancy of a benign osteoblastoma.

Careful clinical, radiographic and histopathologic evaluation is essential to formulate a diagnosis, treatment plan and prognosis in each case.

Author's Contributions

The manuscript was written by M.C.N.A.

Funding

No funding to declare.

Ethics Approval and Consent to Participate

This study was approved by the Research Bioethics Area, Centro de Desarrollo Estratégico e Información en Salud y Seguridad Social (CENDEISSS), Caja Costarricense de Seguro Social, Costa Rica (No. CENDEISSS-AB-0401-2021).

Consent for Publishing Photographs

Written informed consent was obtained from the legal guardian of the patient for publication of this article and accompanying images.

Conflict of Interest

No potential conflict of interest relevant to this article was reported.

References

1. Jones AC, Prihoda TJ, Kacher JE, Odingo NA, Freedman PD. Osteoblastoma of the maxilla and mandible: a report of 24 cases, review of the literature, and discussion of its relationship to osteoid osteoma of the jaws. *Oral Surg Oral Med Oral Pathol Oral Radiol Endod* 2006;102:639-50. <https://doi.org/10.1016/j.tripleo.2005.09.004>
2. Bokhari K, Hameed MS, Ajmal M, Togoo RA. Benign osteoblastoma involving maxilla: a case report and review of the literature. *Case Rep Dent* 2012;2012:351241. <https://doi.org/10.1155/2012/351241>
3. Peters TE, Oliver DR, McDonald JS. Benign osteoblastoma of the mandible: report of a case. *J Oral Maxillofac Surg* 1995;53:1347-9. [https://doi.org/10.1016/0278-2391\(95\)90599-5](https://doi.org/10.1016/0278-2391(95)90599-5)
4. Danielidis J, Triaridis C, Demetriadis A, Psifidis A. Mandibular ramus osteoblastoma. A case report. *J Maxillofac Surg* 1980;8:251-4. [https://doi.org/10.1016/s0301-0503\(80\)80108-1](https://doi.org/10.1016/s0301-0503(80)80108-1)
5. Manjunatha BS, Sunit P, Amit M, Sanjiv S. Osteoblastoma of the jaws: report of a case and review of literature. *Clin Pract* 2011;1:e118. <https://doi.org/10.4081/cp.2011.e118>
6. Miyajima D, Ishikawa A, Yagihara K, Ishida T, Yagishita H, Kasurano M, et al. A rare case of osteoblastoma of the mandible. *J Oral Maxillofac Surg Med Pathol* 2015;27:884-7. <https://doi.org/10.1016/j.ajoms.2015.04.001>
7. Mardaleishvili K, Kakabadze Z, Machavariani A, Grdzeldze T, Kakabadze A, Sukhitashvili N, et al. Benign osteoblastoma of the mandible in a 12-year-old female: a case report. *Oncol Lett* 2014;8:2691-4. <https://doi.org/10.3892/ol.2014.2593>
8. Castro PHS, Molinari DL, Stateri HQ, Borges AH, Volpato LER. Aggressive osteoblastoma in a seven-year-old girl's mandible: treatment and six-year monitoring. *Int J Surg Case Rep* 2016;27:5-9. <https://doi.org/10.1016/j.ijscr.2016.07.033>
9. Sahu S, Padhiary S, Banerjee R, Ghosh S. Osteoblastoma of mandible: a unique entity. *Contemp Clin Dent* 2019;10:402-5. https://doi.org/10.4103/ccd.ccd_676_18
10. Pontual ML, Pontual AA, Grempl RG, Campos LR, Costa Ade L, Godoy GP. Aggressive multilocular osteoblastoma in the mandible: a rare and difficult case to diagnose. *Braz Dent J* 2014;25:451-6. <https://doi.org/10.1590/0103-6440201300220>
11. Panigrahi RG, Bhuyan SK, Pati AR, Priyadarshini SR, Sagar S. Non aggressive mandibular osteoblastoma- a rare maxillofacial entity. *J Clin Diagn Res* 2016;10:ZD06-8. <https://doi.org/10.7860/jcdr.2016/13709.7630>
12. Vinuth DP, Agarwal P, Gadewar D, Dube G, Dhirawni R. A large multifocal aggressive osteoblastoma of mandible: an immunohistochemistry case study report. *J Dent Res Dent Clin Dent Prospects* 2014;8:51-5. <https://doi.org/10.5681/joddd.2014.009>
13. Mahajan A, Kumar P, Desai K, Kaul RP. Osteoblastoma in the retromolar region - report of an unusual case and review of literature. *J Maxillofac Oral Surg* 2013;12:338-40. <https://doi.org/10.1007/s12663-011-0263-4>
14. Smith RA, Hansen LS, Resnick D, Chan W. Comparison of the osteoblastoma in gnathic and extragnathic sites. *Oral Surg Oral Med Oral Pathol* 1982;54:285-98. [https://doi.org/10.1016/0030-4220\(82\)90098-6](https://doi.org/10.1016/0030-4220(82)90098-6)
15. Kim KS, Kim MJ, Seo BM, Chu SC, Lee GC. Benign osteoblastoma of the mandible: report of a case and review of the literature. *J Korean Assoc Oral Maxillofac Surg* 1991;17:54-60.
16. Ataoglu O, Oygur T, Yamalik K, Yucel E. Recurrent osteoblastoma of the mandible: a case report. *J Oral Maxillofac Surg* 1994;52:86-90. [https://doi.org/10.1016/0278-2391\(94\)90022-1](https://doi.org/10.1016/0278-2391(94)90022-1)

How to cite this article: Navas-Aparicio MC. Benign osteoblastoma of the mandible: a case report. *J Korean Assoc Oral Maxillofac Surg* 2023;49:49-52. <https://doi.org/10.5125/jkaoms.2023.49.1.49>