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Treatment options in cementoblastoma

B. D'ORTO, A. BUSA, G. SCAVELLA, C. MORESCHI, P. CAPPARÈ, R. VINCI

Department of Dentistry, IRCCS, San Raffaele University Hospital, Milan, Italy

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ABSTRACT

Background Cementoblastoma is a benign neoplasia characterized by the formation of cementum-like tissue that connects to the root of a tooth. Various therapeutic approaches have been described in the literature, the most widely used being surgical enucleation of the lesion associated with extraction of the attached tooth. Some authors propose enucleation of the cementoblastoma with attached tooth preservation.
Case report This case report describes a 32-year-old Caucasian female with two symmetrical mandibular growths, the largest of which was surgically removed together with the attached tooth, while the other was preserved and steadily monitored. After 15 years of follow-up, no recurrence was observed in the surgical site. The preserved lesion maintained the same dimension and radiographic appearance, although after 3 years the attached tooth required endodontic treatment. With continuous monitoring being the primary prerequisite for this therapeutic choice, preservation of the lesion meant that the patient was able to avoid invasive surgical procedures.
Conclusion Our results agree with the theory which describes cementoblastoma as a self-limiting lesion. However, its monitoring is crucial whatever the therapeutic choice might be.

KEYWORDS Cementoblastoma; Differential diagnosis; Endodontic treatment; Fibrosseous dysplasia; Osteosarcoma.

INTRODUCTION

Cementoblastoma was first described in 1927 by Dewey as being an odontogenic tumor with a mesenchymal origin (1,2). It can be also defined as a benign neoplasia characterized by the formation of cementum-like tissue in connection with the root of a tooth (3,4). It accounts for 0.8% to 2.6% of all odontogenic tumors (5).
The World Health Organization classifies this type of lesion under cemento-osseous dysplasia (COD) (6), which is a benign disorder where normal bone is replaced by fibrous tissue containing mineralized sections composed of bone, cement, or both (7).
Although previous studies show higher prevalence in females than in males, there are no statistically significant odds between genders (3, 8). This tumor mainly affects young adults during the second and third decade of life, yet some cases have also been reported in deciduous teeth (9, 10). The tumor is located more frequently in the mandible then in the maxilla, mainly in the posterior region, but in rare cases it might also be found in the anterior region (3, 11). The first mandibular molar and the second mandibular premolar are the most affected teeth (12).
Cementoblastoma is generally clinically asymptomatic, and diagnosis is usually made following X-ray observation (13). However, some cases report pain, swelling of the affected site, tooth mobility, and paresthesia (14, 15). The affected tooth usually preserves its pulp vitality, but root resorption or obliteration is often observed (16). Radiographically, cementoblastoma appears as a mass connected to the root of the tooth, characterized by central opacity surrounded by a radiolucent halo (17, 18). Although radiographic evaluation represents a valid support for diagnosis, diagnostic hypothesis must be confirmed by histological examination (15).
Differential diagnosis of cementoblastoma has to be made with fibrous dysplasia, osteoblastoma, cementoossifying fibroma, and osteosarcoma (10,14,19).
We herein describe a 15-year follow-up case of bilateral cementoblastoma treated with both surgical and conservative therapy.

CASE REPORT

In October 2003, a 32-year old Caucasian female came to the Department of Oral Surgery of the San Raffaele Hospital, Milan, complaining of pain in the left side of the jaw. Anamnesis was carried out and her medical history showed good general health with the absence of any systemic diseases. Clinical examination revealed acute pericoronitis related to a partially impacted left third

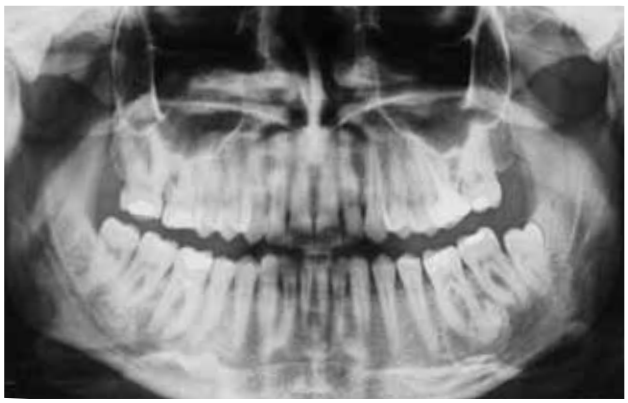

FIG. 1 The radiological findings (orthopantomograph) suggested a previous diagnosis of symmentrical cementoblastoma.

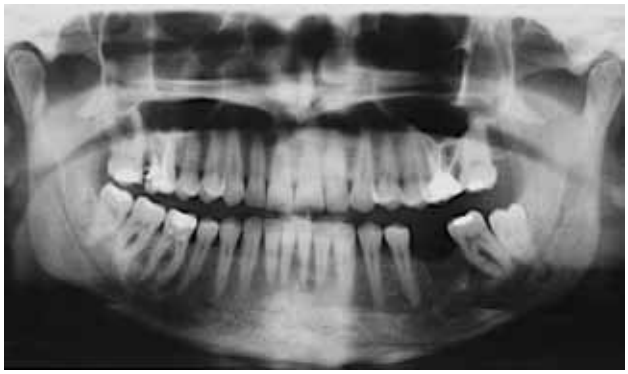

FIG. 3 Orthopantomograph after the surgical treatment.

molar (4.8). Radiological examination was prescribed to evaluate the extension of the lesion and the position of the third molar.
OPT showed the presence of two symmetrical radiopaque masses surrounded by a radiolucent rim that seemed to be in continuity with teeth 4.6 and 3.6. The dimension of the left lesion was 16 mm, while the dimension of the right lesion was 11 mm. Radiological findings suggested a previous diagnosis of symmentrical cementoblastoma (Fig. 1).

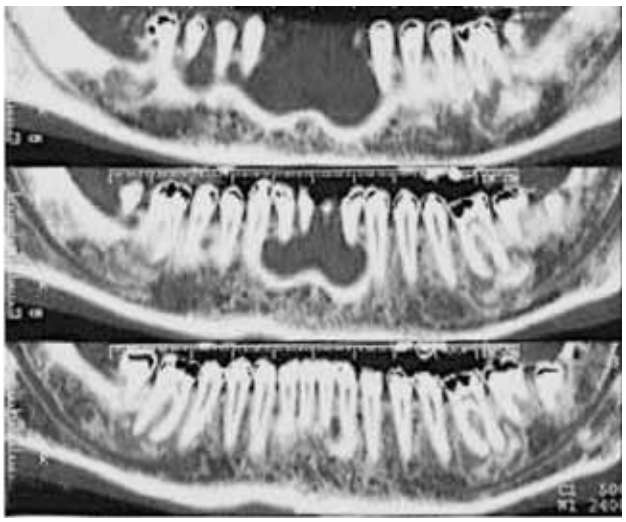

FIG. 2 CBCT of the mandible that revealed the absence of the erosion of both the lingual and buccal cortices; both lesions involved the mandibular canal.

A dental scan was prescribed to better evaluate the extension of the lesions and the anatomical relationship with the adjacent teeth and the mandibular nerve. CT scan revealed the absence of the erosion of both the lingual and buccal cortices; both lesions involved the mandibular canal (Fig. 2).
The patient underwent surgery under general anesthesia to remove the tumor on the left side together with the attached tooth (3.6). Following surgical excision complete surgical curettage of the cavity was performed. The flaps were sutured with Polypropylene Suture 3.0.
Considering its dimension the right-side lesion with tooth 46 was preserved. Specimens were sent to a pathologist for definitive diagnosis. Tissue samples were

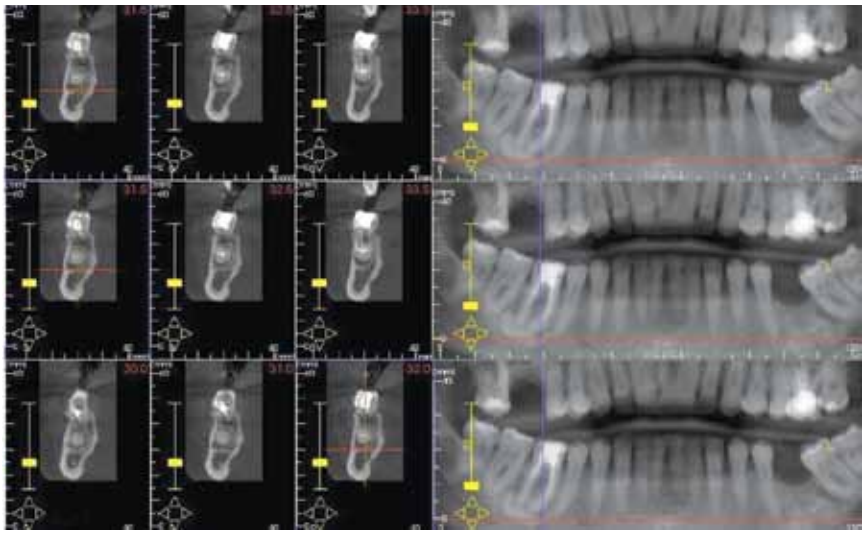

FIG. 4 CBCT at the 12-year follow-up.

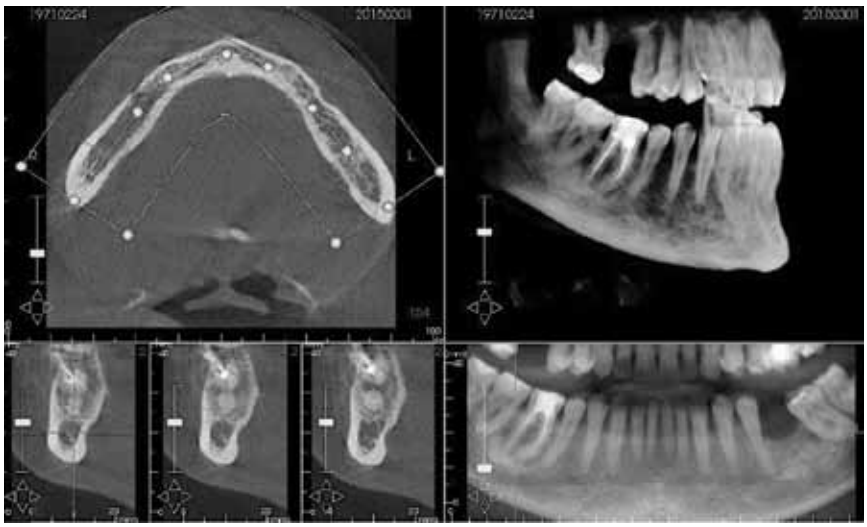

FIG. 5 CBCT at the 15-year follow-up, cross section of 4.6.

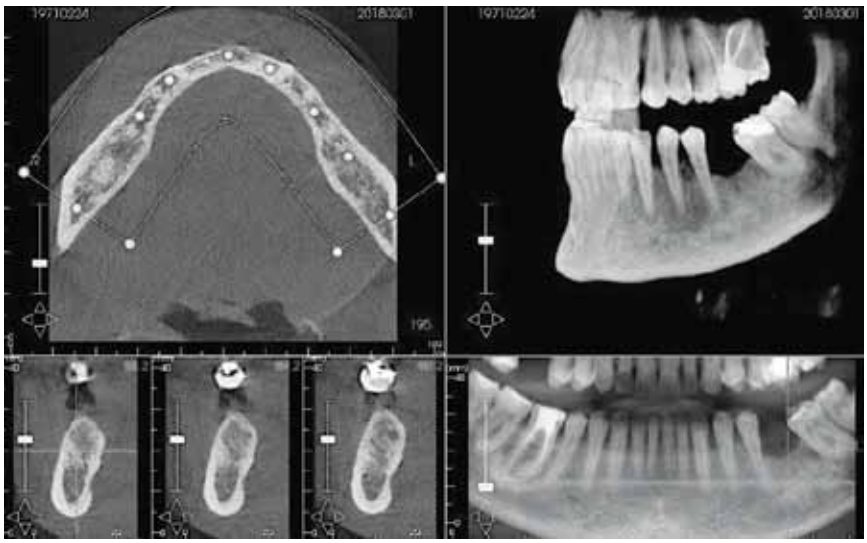

FIG. 6 CBCT at the 15-year follow-up, cross section of 3.6.

fixed in 10% formalin, decalcified with formic acid, and routinely processed and embedded in paraffin with cut sections of 3-4 micron. The sections were stained with hematoxylin-eosin. At microscopical examination, the sample presented two basic components: fibro-osseous areas (composed of irregular bone trabeculae with osteoblastic component, in fibrous cell stroma) and areas formed by compact bone cement, with a prevalent fasciculate aspect of the bone plates. No elements were referable to dentin or enamel. A diagnosis of benign cementoblastoma was confirmed by the pathologist.
During the first visit after surgery, a vitality test of 4.6 was carried out; according to the negative result of the test, the tooth underwent endodontic treatment. Although the apical detector confirmed achievement of the apex, X-rays showed a controversial situation. It is assumed that the lesion caused possible obliteration of the root canal, making real achievement of the apex impossible.
The patient was scheduled for follow-up every 6 months for the first year, and thereafter once a year (Fig. 3, 4, 5, 6).

At the 15-year follow-up (Fig. 5, 6) no recurrence of the cementoblastoma was seen; we also noted that the size of the cementoblastoma in the 4.6 area showed no change (Fig. 5).

DISCUSSION

This case report shows two different treatment choices. Such lesions are often asymptomatic, with diagnosis being made accidentally following X-ray observation (13). However, some cases report pain, swelling of the affected site, tooth mobility, and paresthesia (14,15).
The affected tooth usually preserves pulp vitality, but, as in the reported case, it is often subject to root resorption or obliteration (16).
Radiographically, cementoblastoma appears to be a mass connected to the root of the tooth, characterized by central opacity surrounded by a radiolucent rim (17,18).
Although radiographic evaluation represents valid

diagnostic support, this hypothesis must be confirmed by histological examination (15).
Under a microscope a cementoblastoma appears as a cementum-like tissue mass attached to the root of the tooth, bounded by cementoblast rows and basophilic reversal lines. The stroma is composed of loose fibrovascular tissue in which there are osteoblasts and osteoclasts. The presence of these cells is indicative of a lesion's remodeling during the growth phase. In the periphery of the lesion, perpendicular to the surface, there are columns of unmineralized tissue (17,18).
Histological examination of the cementoblastoma is also important in order to carry out differential diagnosis with apparently similar growths, such as osteoblastoma and osteosarcoma (10,14).
An osteoblastoma is a benign bone tumor that affects the maxillofacial skeleton in 11% of cases. Like cementoblastoma, it mainly affects young adults in the second and third decades of life; radiographically it shows up as a radiopaque mass (20).
It can develop near the root of the tooth, extending to the level of the alveolar process, and can be confused with cementoblastoma. Moreover, if its dimensions are contained it can be asymptomatic (21).
The osteosarcoma is a non-hematopoietic tumor of the bone, which can be also located in the mandible (22,23). Radiographically, it often has a sunburst periosteal pattern, and, as with cementoblastoma, can lead to root resorption of the involved tooth (14).
Unlike cementoblastoma, it is characterized by high levels of malignancy, metastasis, and mortality. It requires more aggressive treatment where surgery has to be associated with oncological therapy (24,25).
Various therapeutic choices have been proposed for treatment of cementoblastoma, depending on the impact of the lesion or the position of the anatomical structures. As seen in several cases, this lesion can lead to cortical perforation, adjacent tooth displacement, and maxillary sinus involvement (22,11).
The most common therapy for cementoblastoma is complete enucleation associated with extraction of the involved tooth (3,4,9).
Tooth extraction is recommended to simplify the differential diagnosis between cementoblastoma and other lesions not involving the dental root during histological examination (26).
Some authors also describe cases where enucleation of the tumor without tooth extraction was carried out (16). In both approaches, the authors emphasize the importance of surgical curettage. Cementoblastoma recurrence occurs in approximately 37% of cases and is more common when surgical treatment is incomplete (8,17). For the same reason, when the tooth is preserved root apicectomy is recommended: the cementoblasts contained in the apical third of the root might produce cementoid matrix at an uncontrolled rate and favoring recurrence (9,27).
Another possible therapeutic choice is lesion monitoring. It consists of preservation of both the involved tooth and the cementoblastoma during follow-up.
In our case report, we describe two treatment options. On the left mandibular side the cementoblastoma was surgically removed together with the involved tooth, while on the right mandibular side the cementoblastoma was preserved together with the involved tooth.
Papageorge et al., state that cementoblastoma is a self-limiting lesion, while in 2006 Nanci and Bosshardt affirmed that cementoblastoma shows unlimited growth (28,29).
Our results confirmed the Papageorge theory, since the right lesion had not increased at 15-year follow-up.

CONCLUSION

In this case report, cementoblastoma was treated tn the left mandible with surgical therapy, while on the right mandible cementoblastoma was approached in a more conservative manner. The literature describes various therapeutic methods, and each case must be analyzed carefully. Our results agree with the theory proposed by Papageorge, which describes cementoblastoma as a self-limiting lesion. However, lesion monitoring is crucial whatever the therapeutic choice might be.

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