



Cementoblastoma associated with a primary tooth: a rare pediatric lesion

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Abstract

An intraosseous, slightly painful swelling was noted upon clinical examination of an eight-year-old girl. The swelling was of an unspecified duration and slow growing in nature. A radiopaque mass with a radiolucent periphery attached to the roots of the mandibular right second primary molar was noted on a periapical radiograph. The diagnosis of cementoblastoma was verified by the histologic assessment. (Pediatr Dent 23;351-353, 2001)

The cementoblastoma has been classified as a benign tumor of odontogenic origin derived from ectomesenchyme. Histologically, it is “a neoplasm characterized by the formation of sheets of cementum-like tissue containing a large number of reversal lines and a lack of mineralization at the periphery of the mass or in the more active growth area.”¹ A cementoblastoma is fused with the roots of vital teeth and appears as a round radiopaque mass encircled by a thin radiolucent periphery.²

A recent review of 71 cases summarized the following clinical features: 1) The most common site of predilection is the mandibular molar area followed by the mandibular premolar area; 2) In 50% of the cases, the mandibular first permanent molar is affected; 3) Approximately 50% of cementoblastomas are found in patients under the age of 20; 4) These tumors exhibit a slightly higher predilection for females.³

The cementoblastoma is an uncommon tumor, comprising less than 1% of all odontogenic tumors.⁴ The tumor primarily arises on the permanent dentition and to our knowledge there have been only five cases reported in association with primary teeth.⁵⁻⁹ We report a case of cementoblastoma associated with a mandibular primary second molar.

History, clinical and radiographic findings

An eight-year-old black female patient was referred by her pediatrician for evaluation of a right mandibular swelling of an unspecified duration. Clinically, the area adjacent to the mandibular right second primary molar exhibited a firm, slightly painful, bony lesion. Although the tooth had been previously restored, the dental history was unclear, and the dentist was no longer in practice. A periapical radiograph showed a radiopaque mass with a radiolucent periphery attached to the roots of the mandibular right primary second molar (Fig 1). The second premolar was displaced inferiorly and distally (Fig 1). The reported clinical differential diagnosis included



Fig 1. The radiograph shows large lesional area below tooth #T. Displacement of the second premolar is evident.



Fig 2. Immediate post-surgical radiograph of the area.

cementoblastoma, hypercementosis and condensing osteitis. The lesion was surgically removed along with the tooth and a post-surgical radiograph was obtained (Fig 2). The lesion measured 15 mm in diameter and grossly exhibited a color similar to that of cementum. The specimen was fixed in 10% neutral buffered formalin, decalcified, and processed for light microscopic examination.

Histopathology

Microscopically, the tumor consisted of a calcified mass fused with the roots of the tooth with resultant obliteration of the periodontal ligament (Fig 3). The tumor mass was comprised of cementum-like tissue containing small spaces with few cel-

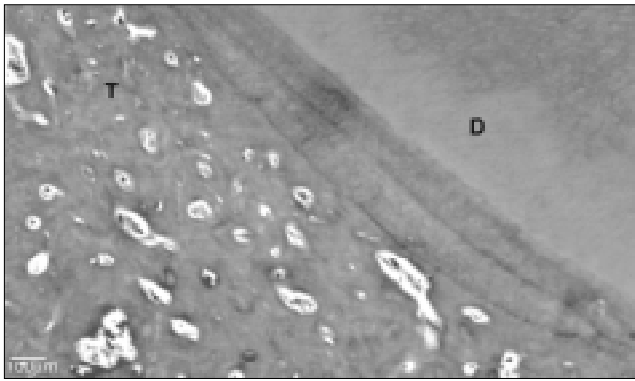


Fig 3. The photomicrograph depicts dentin (D) and the tumor tissue (T) on the left (Hematoxylin-Eosin stain). Bar = 100µM.

lular elements imparting an inactive growth pattern. In many areas, the peripheral portion of the tumor mass exhibited calcified trabeculae and prominent cementoblasts (Fig 4).

In addition, at the outer zones of the specimen, a number of trabeculae were aligned at right angles to the body of the lesion. The tumor mass was encapsulated by a fibrous connective tissue capsule, which separated it from the host bone. The tooth contained vital pulpal tissues.

Diagnosis

The observed clinical and radiographic findings along with microscopic evaluation support the diagnosis of cementoblastoma.

Treatment

Cementoblastoma is a locally aggressive lesion, and therefore, requires surgical excision. An excellent prognosis can be expected if complete excision and removal of the associated tooth is performed.¹⁰ There have been reports of treatment with enucleation of the tumor via apicoectomy following root canal treatment with no recurrence during a four year follow-up.¹¹ However, subsequent extraction of the affected teeth has also been reported. The patient involved in this case report could not be contacted for a follow-up examination.

Differential diagnosis

The calcifiable matrices within the jaws include osseous tissue, cartilage, cementum, dentin, and enamel. The lesions capable of forming these cellular products can appear radiolucent and/or radiopaque in radiographs. The differential diagnosis of periapical or central radiopaque lesions of the jaws in children primarily include osteoma, osteoblastoma, fibrous dysplasia, central ossifying fibroma, and juvenile ossifying fibroma.¹² The osteomas may be found within the maxillary antrum and are also more commonly found in the ethmoid and frontal sinuses but are not associated with a tooth. Also, these lesions have also been reported as a component of Gardner's syndrome.

Osteoblastoma and cementoblastoma often exhibit similar histologic appearances. A diagnosis of cementoblastoma can be established if the lesion is attached to the roots of a tooth. Juvenile ossifying fibroma occurs in a similar age group with a predilection for the maxilla. These aggressive lesions tend to cause divergence of teeth and are not attached to the roots.

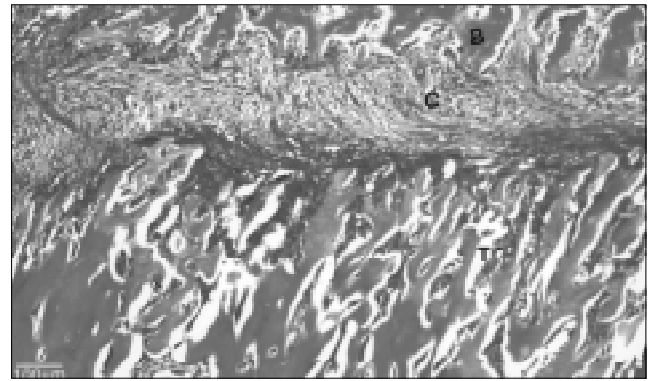


Fig 4. Lower three-quarters of the photograph shows tumor tissue (T) surfaced by a capsule (C) and host bone (B) (Hematoxylin-Eosin stain). Bar = 100µM.

Variable histologic features have been reported in juvenile ossifying fibroma lesions and they generally exhibit a proliferation of spindle-shaped cells supported by a fine collagenous stroma. The immature cellular osteoid matures into woven bone and the formation of small spherical ossicles is a characteristic feature of juvenile ossifying fibroma.

The cemento-ossifying fibroma, with a predilection for the mandible, is a painless lesion producing asymmetry of the face. Radiographically, the lesion is well demarcated from the host bone. Histologically, the tumor shows osteoid and trabeculae of bone surfaced by osteoblasts and supported by a fibrous stroma of varying cellularity. Craniofacial dysplasia commonly involves the jaws and manifests as a slow-growing, painless swelling.

Radiographically, lesions of craniofacial dysplasia exhibit a ground glass appearance blending with the normal host bone. Histologically, the lesions consist of irregular separate trabeculae of immature bone supported by a fibrous tissue stroma. The osseous fragments are generally not lined by osteoblasts, and the lesional bone fuses with the normal bone, thus masking the demarcation between lesional and host bone.

Clinical significance

Cementoblastoma of the permanent dentition is an uncommon lesion and is even more uncommon on primary teeth. Although cementoblastomas of the permanent dentition have been reported in the pediatric age group, only five cases of cementoblastoma in the primary dentition have been reported previously and no case report is published in a pediatric journal. It is a locally aggressive tumor resulting in root resorption necessitating the extraction of the involved tooth. In addition, it also causes jaw deformity and displacement of the adjacent teeth. Though locally aggressive, it is imperative that a definitive diagnosis is rendered to rule out more serious illnesses such as the osteomas associated with Gardner's Syndrome. This allows the selection of an appropriate treatment modality since the radiopaque lesions vary in their local aggressiveness, and therefore, need to be treated accordingly. The recurrence of cementoblastoma is a concern, necessitating complete excision.

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ABSTRACT OF THE SCIENTIFIC LITERATURE



The effect of sucrose diet of rat dams on the dentin apposition

The objective of this study was to evaluate the effects of a high sucrose diet given to rat dams on dentinogenesis and caries progression in their pups. Three Sprague-Dawley dams received standard rodent diet and 3 received high-sucrose diet. Half of the pups of each group of dams received standard rodent diet while the other half received high-sucrose diet. Two intraperitoneal injections of oxytetracycline hydrochloride were performed to allow for the examination of dentin apposition overtime. Dental caries was determined using Schiff's staining. High-sucrose diet of rat dams resulted in reduced dentinogenesis in their pups. Reduced dentin apposition was also observed when the pups themselves were exposed to high sucrose diet as compared to controls. The pups of the three sucrose-exposed groups presented more caries than the double control group (dams and pups fed with a standard rodent diet).

Comments: This study demonstrates that maternal high-sucrose diet, as well as direct sucrose exposure, results in decreased apposition of dentin during primary dentinogenesis. The authors suggest that a high-sucrose diet affects odontoblast function, and results in reduced dentin apposition. As expected, high sucrose diets were also associated with enhanced occurrence of dental caries. Interestingly, maternal high-sucrose diet was sufficient to enhance the caries experience of offsprings that received low-sucrose diet. JN

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The effect of sucrose diet of rat dams on the dentin apposition and dental caries of their pups. Pekkala E, Hietala EL, Puukka M, Larmas M. *Arch. Oral Biol.* 45: 193-200, 2000.

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