Benign Cementoblastoma

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Abstract

The benign cementoblastoma also called as ‘true cementoma’. It is rare odontogenic tumor representing less than 1% of all odontogenic tumors. Norberg initially described it in 1930. The WHO defines the benign cementoblastoma as “a neoplasm characterized by the formation of shed of cementum like tissue which may contain a very large number of reversal line and may be unmineralized at the periphery of the mass or in the more active growth areas.”

The benign cementoblastoma occurs most frequently under the age of the 25 years with slight predilection for males. Cementoblastoma can be unmineralized at the periphery of the mass or in the more active growth areas.

The accepted theory of its origin is that it is a mesenchymal odontogenic tumor. The cementoblastoma’s precise derivation is connective tissue of the periodontal ligament.

The benign cementoblastoma occurs most frequently under the age of the 25 years and there appears to be a slight predilection for males. Cementoblastoma can occur in both maxilla and the mandible. The mandible however is involved three times more frequently than maxilla. The mandibular first permanent molar is the most frequently affected tooth.

This article describes the rare case of benign cementoblastoma occurred in a 13-year-old girl with its radiological and histological features.

Keywords: Benign cementoblastoma, true cementoblastoma, cementoblasts, mesenchymal odontogenic tumor, cementum, reversal lines.

The benign cementoblastoma is also called as true cementoma. It is rare odontogenic tumor representing less than 1% of all odontogenic tumors. Norberg initially described it in 1930 and defined as a true neoplasm of cementum or cementum like tissue and formed on a tooth root by cementoblasts. The WHO defines the benign cementoblastoma as “a neoplasm characterized by the formation of shed of cementum like tissue which may contain a very large number of reversal line and may be unmineralized at the periphery of the mass or in the more active growth areas.”

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The benign cementoblastoma occurs most frequently under the age of the 25 years and there appears to be a slight predilection for males. Cementoblastoma can occur in both maxilla and the mandible. The mandible however is involved three times more frequently than maxilla. The mandibular first permanent molar is the most frequently affected tooth. The associated tooth is vital unless coincidentally involved. The lesion is slow growing and produces cortical expansion. Pain is frequently present and it is the most common symptom.

The radiological appearance of the cementoblastoma is highly characteristic, seen as circular radiopaque mass attached to the root of the one or more teeth. A narrow radiolucent zone surrounds the lesion and delineates from adjacent bone. The outline of the affected root is generally obliterated because of resorption of the root and fusion of the mass to the tooth.

Histopathologically a cellular fibrous stroma and active cementoblasts producing immature areas irregularly mineralized trabeculae of cementum fused to tooth root characterized it. Numerous reversal lines give mosaic pattern to the calcified portion. The histopathological presentation of cementoblastoma obviously resembles that of osteoblastoma with primary distinguishing feature being tumor fusion with the involved tooth.

The recommended treatment of cementoblastoma usually consists of the surgical extraction of the tooth together with the attached calcified mass. Surgical excision of the mass with root amputation and endodontic treatment of the involved tooth may be considered. The prognosis is excellent and the tumor does not recur after total removal.

CASE REPORT

A 13-year-old girl seen on April 23, 2005 at VSPM Dental College and Research Center, Nagpur, India had a chief complaint of pain and swelling in the mandibular left posterior region since 3 to 4 months. She had first noticed a gradually increasing swelling on the left side of her lower jaw 3 to 4 month previously. Medical, dental and family histories were noncontributory.

Extraoral examination showed a swelling on the left side of the face which causes slight asymmetry. The swelling was hard, in consistency and mild tender on palpation. There was no associated lymphadenopathy.

Intraoral inspection showed that the swelling is localized in the molar region of left side of the lower jaw. There was expansion of the both buccal and lingual cortical plate. The teeth were not loose. Overlying mucosa was normal (Fig. 1).

Panoramic radiograph showed a dense radiopaque mass, delineated by a narrow radiolucent band at the periphery.
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The mass was round and measuring 2.5 × 2.5 cm in diameter. It was fused to the roots of the left mandibular second premolar and first molar. There was noticeable downward displacement of the lower border of mandible and neurovascular bundle. A clinicoradiographic diagnosis of benign cementoblastoma was made (Fig. 2).

The patient was scheduled for surgical removal of the tumor and extraction of the associated premolar and first molar under general anesthesia. At the time of surgery a buccal full thickness envelop flap was developed to identify the mental nerve and the lesion. The lesion was well-encapsulated. Separation from surrounding tissue was easily performed. The teeth were luxated with the extraction forceps and delivered buccally with associated mass attached in toto. The periphery of the bony cavity was curetted and the wound was closed primarily using interdentally wire loop splints. The splinting were removed 4 weeks postoperative. Healing was uneventful (Fig. 3).

The specimen was submitted for histological evaluation. Gross examination showed noncarious mandibular premolar and molar with the root apex embedded in a spherical mass of hard tissue. Radiograph reveals resorption of the apical third of the root and fusion of the resorbed root with a radiopaque mass with a radiant pattern at the periphery. Histologically decalcified H and E stained section show tissue consisting of mineralized material, which resembles cementum like tissue. This mineralized tissue shows irregularly placed lacunae and prominent basophilic reversal lines. These trabaculae are frequently lined by cementoblast like cells. Cellular fibrovascular tissue present between these trabaculae. The periphery of the lesion is composed of uncalcified matrix, which is arranged in radiating columns (Fig. 4).

Clinical, radiological and histopathological features are suggestive of benign cementoblastoma.

DISCUSSION

The first case of cementoblastoma is reported by Norberg in 1930. According to WHO benign cementoblastoma belongs to the category of cementifying fibroma, periapical cemental
dysplasia and gigantiform cementoma. Cementoblastoma is unusual in several aspects.

Most of the cases are diagnosed in patient younger than 20 years. The age of the patient in this case is 13 years. The youngest patient reported was 5-year-old male and the oldest patient was 72 years old women. Typically tumor is located in mandible and associated with the first mandibular molar. When lesions in the maxilla and mandible are grouped together, over 90% of cases affect a single tooth in the premolar-molar area. However, the case has also been reported in mandibular anterior region involving multiple deciduous teeth. In the present case, the lesion is associated with the mandibular first molar. Clinical examination reveals the swelling on left side of the face which is hard in consistency and mildly tender on palpation. Intraorally there was expansion of buccal and lingual, cortical plates. Panoramic radiograph shows round dense radiopaque mass attached to the roots of the right mandibular second premolar and first molar surrounded by narrow radiolucent band.

On the basis of clinical and radiological examination, diagnosis of cementoblastoma was made. Other opaque lesion which share the same features include odontoma (not associated with the root), focal sclerosing osteomyelitis (margins are ill-defined) hypercementosis (not surrounded by the radiolucent band) are considered in differential diagnosis.

Associated teeth are vital but may be nonresponsive to pulp test probably indicating disruption of normal impulse transmission since the tumor tends to encompass the root apex. Pain, abnormal pulp test plus the radiographic features might suggest localized sclerosing osteomyelitis (condensing osteitis), but the consistent finding of a well-demarcated radiolucent border is the clue to true nature of the lesion.

The excisional biopsy reveals irregularly place lacunae and prominent basophilic reversal lines. Histologically cementoblastoma shows sheets of cementum like tissue, sometimes resembling secondary cellular cementum. Reversal lines scattered throughout this calcified tissue are often quite prevalent. There is variable soft tissue component consisting of fibrillar, vascular and cellular elements. The lesion is frequently microscopically indistinguishable from the benign osteoblastoma or giant osteoid osteoma. The hallmark of benign osteoblastoma consist of the ‘vascularity to the lesion with many dilated capillaries scattered throughout the tissue’, ‘the moderate numbers of multinucleated giant cells scattered throughout the tissue’, and ‘the actively proliferating osteoblasts which pave the irregular trabaculae of new bone’.

Slootweg as confirmed that the histological features of osteoblastoma and cementoblastoma are indistinguishable apart from the attachment of cementoblastoma to the root of the tooth. If not recognized by the clinical and other features, the highly active cellular appearance and pleomorphism of the cells, particularly at the periphery, a cementoblastoma can be mistaken for an osteosarcoma. However, cementoblastoma cells though not readily distinguishable from osteoblasts or osteoclasts, do not show mitotic activity.

Other lesion that might be considered in differential diagnosis is osseous dysplasia, ossifying fibroma, osteoma, hypercementosis, chronic sclerosing osteomyelitis, fibrous dysplasia, osteitis deformans, and osteosarcoma. Careful consideration of the signs and symptoms in conjunction with the histological finding should lead to the correct diagnosis. No reports of malignant alteration exist in connection with the benign cementoblastoma.

Because of the apparent neoplastic nature of this process, complete excision of the tumor with the involved tooth is recommended. The prognosis of benign cementoblastoma treated as recommended is excellent with no recurrence having been reported.

REFERENCES