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Cementoblastoma: A Comprehensive Review Of Etiopathogenesis, Clinical Features, Diagnosis And Management

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Abstract

Cementoblastoma is a rare benign odontogenic neoplasm characterized by the formation of mineralized cementum-like tissue fused to the root of an involved tooth.⁴ It accounts for less than 1% of all odontogenic tumors and predominantly affects young individuals in the mandibular posterior region.¹ Clinically, it presents with localized swelling and pain, while radiographically it appears as a well-defined radiopaque mass surrounded by a radiolucent halo attached to the tooth root.⁵ Histologically, the lesion demonstrates sheets of mineralized cementum-like tissue with reversal lines and peripheral plump cementoblasts.⁵ Although benign, cementoblastoma exhibits unlimited growth potential and may cause cortical expansion and root resorption.⁵ The standard treatment involves complete surgical excision along with extraction of the associated tooth. Recurrence is uncommon but may occur following incomplete removal.⁴ This review discusses epidemiology, etiopathogenesis, clinical and radiographic features, histopathology, differential diagnosis, treatment strategies, and prognosis.

Keywords: Cementoblastoma, odontogenic tumor, cementoblast, osteoblastoma

Introduction

Cementoblastoma is a benign mesenchymal odontogenic tumor arising from cementoblasts. According to the classification by the World Health Organization (WHO), cementoblastoma is categorized under benign odontogenic tumors of ectomesenchymal origin with or without odontogenic epithelium.⁴

The defining feature of cementoblastoma is its intimate fusion with the root of a tooth, distinguishing it from other cemento-osseous lesions. The tumor exhibits continuous growth potential and may cause significant expansion if left untreated.² Despite its rarity, its distinct clinical and radiographic characteristics make it a recognizable entity in oral pathology.

Historical Background

Cementoblastoma was first described in 1927 by Dewey as a distinct pathological entity. Over time, it has been referred to by various terms including “true cementoma” to differentiate it from reactive cemental lesions. Advances in radiographic imaging and histopathological evaluation have clarified its neoplastic nature rather than reactive origin.^{3, 1}

Epidemiology

Cementoblastoma is an uncommon odontogenic tumor accounting for less than 1% of all odontogenic tumors.²

Age Distribution

- Most commonly occurs in the second and third decades of life.⁴
- Approximately 75% of cases are diagnosed before the age of 30 years.⁴

Gender Distribution

- Slight male predilection reported in several studies.⁶

Site Distribution

- Mandible more commonly affected than maxilla.
- Most frequent site: mandibular first molar.
- Rare cases reported in premolars and primary teeth.

No specific racial or geographic predilection has been consistently documented.⁴

Etiology and Pathogenesis

The precise etiology remains unclear. However, cementoblastoma is believed to arise from neoplastic proliferation of cementoblasts derived from the periodontal ligament.⁵

Proposed Contributing Factors:

- Local trauma
- Inflammatory stimuli
- Developmental disturbances
- Genetic susceptibility (rarely documented)

The lesion grows by continuous deposition of cementum-like tissue. As the tumor enlarges, it becomes fused to the tooth root, often leading to root resorption and obliteration of normal root outline.³

Molecular studies are limited, and no consistent genetic mutation has been identified.²

Clinical Features

Symptoms

- Dull localized pain (most common symptom)
- Progressive swelling
- Tenderness on palpation
- Occasionally asymptomatic (incidental finding)⁴

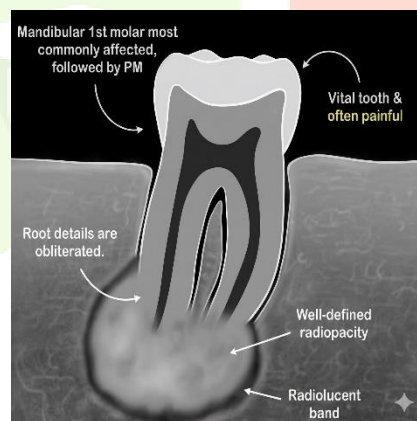
Signs

- Buccal and/or lingual cortical expansion
- Facial asymmetry in larger lesions
- Tooth remains vital in most cases
- Rare cases show paresthesia

Lesions typically measure between 1–3 cm but may grow larger if untreated.⁴

Radiographic Features

Radiographic examination plays a crucial role in diagnosis.



Conventional Radiography

- Well-defined radiopaque mass
- Surrounded by a thin uniform radiolucent halo
- Fused to the root of the involved tooth
- Loss of normal root outline
- Possible root resorption⁵

Advanced Imaging (CBCT)

Cone-beam computed tomography (CBCT) provides:

- Detailed visualization of cortical expansion
- Assessment of cortical perforation
- Relationship to inferior alveolar nerve
- Precise surgical planning⁶

Histopathological Features

Histologically, cementoblastoma resembles osteoblastoma but demonstrates fusion with the tooth root.⁷

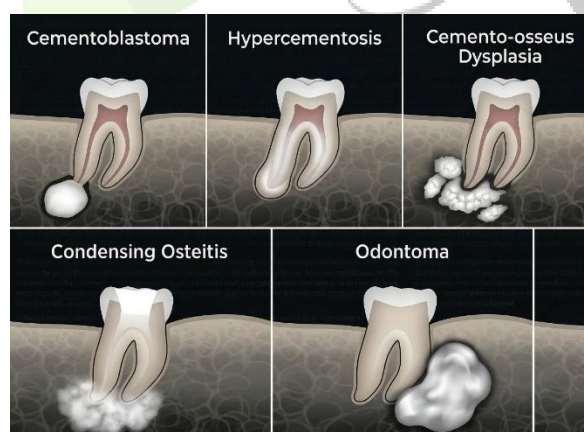
Key Microscopic Features:

- Dense mineralized cementum-like trabeculae
- Prominent basophilic reversal lines
- Peripheral zone of unmineralized matrix
- Plump cementoblasts lining trabeculae
- Multinucleated giant cells
- Vascular connective tissue stroma

The lesion is well circumscribed but not encapsulated.⁵

Differential Diagnosis

Accurate diagnosis requires differentiation from similar lesions:



8.1 Osteoblastoma

- Similar histology
- Not attached to tooth root

8.2 Hypercementosis

- Excess cementum deposition
- No radiolucent halo
- No pain or expansion

8.3 Periapical Cemento-Osseous Dysplasia

- Early radiolucent stage
- Not fused to tooth root

8.4 Condensing Osteitis

- Radiopaque area
- Associated with non-vital tooth

Fusion to the tooth root remains the most critical diagnostic feature.^{7,8}

Treatment and Management

Standard Treatment

- Complete surgical excision
- Extraction of associated tooth

Conservative Approaches

- Root amputation with endodontic therapy (rare cases)
- Higher recurrence risk if incomplete removal

Recurrence

- Reported recurrence rate: 5–10%
- Mainly due to incomplete excision

Regular follow-up (minimum 1–2 years) is recommended.^{4,5,6}

Prognosis

The prognosis is excellent after complete removal. Cementoblastoma does not exhibit malignant transformation or metastatic potential. Functional and aesthetic outcomes are generally favorable when managed appropriately.^{3,4}

Conclusion

Cementoblastoma is a rare but distinctive benign odontogenic tumor characterized by cementum-like tissue formation fused to the tooth root. Although benign, it demonstrates unlimited growth potential.⁵ Clinical, radiographic, and histopathological correlation is essential for accurate diagnosis.⁷ Surgical excision with extraction of the associated tooth remains the gold standard treatment, with an excellent prognosis when adequately managed.⁸

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