

Cemento-osseous dysplasia: Features, diagnosis and treatment

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ABSTRACT

One of the benign fibro-osseous lesions that frequently affect the jaws or edentulous alveolar processes is cemento-osseous dysplasia. Cemento-osseous dysplasia is primarily diagnosed based entirely on clinical and radiological features. Due to the risk of infection, biopsies,

surgery, and tooth extraction are generally not advised. Failure to recognize cemento-osseous dysplasia may cause patients to undergo invasive and unneeded dental operations.

Key Words: *Jaw; Edentulous alveolar; Cemento-Osseous dysplasia; Biopsy; Maxillary antrum*

INTRODUCTION

The most frequent fibro-osseous lesion confined to the jaws' tooth-bearing regions or edentulous alveolar processes is called Cemento-Osseous Dysplasia (COD), in which the normal bone structure is replaced by fibrous tissue containing focal mineralized substances that may be composed of bone, cement, or both [1]. It is believed that the lesion is non-neoplastic and may have originated from reactive or dysplastic changes of the periodontal ligament or medullary bone, though its exact aetiology and pathophysiology are yet unknown [2]. For many years, the term "cemento-osseous dysplasia" has been divisive. The World Health Organization (WHO) classified this lesion as coming from periodontal tissue in 2005; however, the term "cemento" was dropped in favor of the term "osseous dysplasia" because it was believed that the cementum and bone were interchangeable [3]. To stress the odontogenic origin of this lesion, which arises specifically from the periodontal ligament, the WHO's classification most recently published in 2017 reverted to using the term "cemento-osseous dysplasia". Additionally, the WHO first mentioned "familial gigantiform cementoma" in 2005 as a variant of florid COD, but it was later classified as a separate illness in the 2017 classification. This condition is characterized by multiple multi-quadrant lesions and a clear autosomal dominant inheritance pattern [3].

The linkage of demographic data with clinical and radiological characteristics is typically key to the diagnosis of COD [4]. The lesion is frequently found on routine dental radiographs with its classic radiological findings since patients are typically asymptomatic, and biopsy is typically not necessary due to the danger of infection [5].

Most of the time, the lesion is self-limiting, does not require any treatment, and simply has to be monitored radiographically. Apicectomy, extraction due to misdiagnosis, endodontic treatment or re-treatment, and other unneeded iatrogenic dental treatments should be avoided [6].

CLINICAL AND RADIOGRAPHIC FEATURES

Middle-aged Asian and African women, particularly those in their fourth and fifth decades of life, are strongly preferred by COD [7]. Lesions that exhibit self-limiting behavior and do not exhibit significant growth are frequently asymptomatic and discovered by chance during routine radiography examinations [7]. The majority of instances that exhibit symptoms of discomfort such as pain, discharge, and slow healing are related to secondary infections [8]. The mandible is typically affected rather than the maxilla by COD, which is localized in the tooth-bearing portions of the jaws in the periapical region of important tooth/teeth or in edentulous alveolar processes [8]. The 2017 WHO classification identified three COD subtypes: periapical, focal, and florid. COD can be focal or multifocal. All three subtypes are variations of the same disease process and have comparable radiological characteristics. They are differentiated by the distribution and location of the lesions [4,5].

According to the lesion's several stages of development—early, intermediate, and mature stages the internal features of COD lesions might range from radiolucent to mixed to radiopaque [9].

Loss of the lamina dura, a lessened or expanded periodontal ligament space, and sporadically hypercementosis are possible effects of COD on the surrounding teeth and tissues. Root resorption or tooth

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displacement may be found in rare instances, even though uncomplicated or minor lesions typically show without tooth displacement or root resorption and with little to no cortical enlargement. Larger lesions may result in the jaws expanding, the floor of the maxillary antrum moving superiorly or the inferior b alveolar canal moving inferiorly .

HISTOPATHOLOGICAL FEATURES

Without a biopsy, the diagnosis of COD is frequently made based on clinical and radiographic characteristics. Only in unusual circumstances where the diagnosis cannot be firmly established may a biopsy be necessary [2].

The submitted material typically looks like hemorrhagic, dark, gritty tissue bits upon physical examination. Biopsy samples of the lesion may show a tiny interface with normal bone because it is not encapsulated; this is partially due to the surgical curettage of the lesion. The histological appearance of all COD subtypes is the same; they all comprise woven bone and cementum-like particles in a connective tissue stroma. The disease progresses through three stages: osteolytic, mixed, and mature osteogenic, as was previously mentioned [8].

A vascular fibrous stroma with osteoid and a few basophilic cementoid structures can be seen during the osteolytic stage. As the stroma matures, it gets more fibrotic and osteoid trabeculae production becomes more obvious, as evidenced by the emergence of thicker curvilinear bony trabeculae with a distinctive "ginger-root" pattern and potential for the presence of discrete cementoid masses. The lesion grows denser, less cellular, and less vascular as it advances to the mature stage. It's important to note that COD typically exhibits only spotty or no osteoblastic rimming.

DIFFERENTIAL DIAGNOSIS

Due to the wildly variable radiographic characteristics, COD may be mistaken for other radiolucent, mixed, or radiopaque lesions of the jaws as it develops through various phases of maturity [2]. As a result, there may be a wide range of differential diagnoses, including inflammatory periodontal lesions, cystic lesions, and even some odontogenic tumours. Early COD may mimic inflammatory apical diseases connected to non-vital teeth, such as a radicular cyst or periapical granuloma, due to its radiolucent appearance. Additionally, persistent cysts in edentulous locations may be mistakenly identified as COD. Since radiographic findings alone cannot distinguish COD lesions from these inflammatory lesions, clinical information, such as vitality tests of the pertinent tooth and inquiries on any prior dental extractions in the affected area, is required. Radiolucent, mixed, or radiopaque lesions at the apex of important teeth typically indicate COD.

TREATMENT AND PROGNOSIS

Unless the lesions are worsened by infection and osteomyelitis, CODs typically do not require treatment; frequent follow-up with clinical and radiographic evaluation every two to three years is sufficient. To further avoid tooth loss due to periodontal disease,

maintenance and reinforcement of good oral hygiene practices should be encouraged. To avoid exposing the sclerotic masses to the oral cavity, any damage to the COD site should be avoided, including trauma from surgical procedures or removable dentures [10]. Patients with symptoms are more challenging to manage because of the ongoing infection and inflammation that form in the heavily calcified avascular tissue [10]. Infected COD may require care if there is pain, suppuration, or the existence of regions surrounded by osteolysis with or without bone sequestration. Although bone hypovascularization hinders antibiotics from reaching these regions in sufficient quantities, local and/or systemic antibiotic therapy should be the first line of treatment for conservative conditions. For such circumstances, curettage and necrotic bone removal are the most advised surgical techniques [11].

DISCUSSION

The most important step in avoiding unnecessary iatrogenic dental operations and potential disease consequences is a correct diagnosis of COD, which can only be made with enough knowledge of its clinical and radiographic aspects. No biopsy or surgical treatment will be necessary after the clinical and radiological features have been properly identified. To treat periodontal disease and avoid tooth loss, patients should also have recall exams on a regular basis to maintain and reinforce good oral hygiene practices. Periodic radiographic follow-up is necessary for confirmation of the diagnosis.

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