

## Radiographic examination and dental treatment of patients with florid cemento-bone dysplasia: Narrative review



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### ABSTRACT

Flowering cemento-osseous dysplasia is a benign condition characterized by changes in the process of bone formation and the deposit of mineralized tissue in the soft tissues of the oral cavity. The diagnosis of flowering cemento-osseous dysplasia is accompanied by radiographic examinations, and treatment depends on the severity of the condition and the patient's symptoms. Thus, it is important for patients to undergo periodic dental examinations to monitor the progression of the condition. A literature review on the radiographic examination and dental treatment of patients with this condition was conducted with searches in February 2023, in the PubMed, Scielo, Lilacs and BBO databases, following certain criteria for selection. Seven articles were identified and in them, there is evidence that some patients may not have clinical symptoms, but it is possible that patients develop periodontal disease. Having, as a potential complication of the condition, the possibility of losing teeth due to the rapid progression of periodontal disease. In addition, in rare cases, flowering cemento-osseous dysplasia can progress to a more serious condition such as a cemento-ossifying fibro-osseous lesion or an adenomatous odontogenic tumor.

**Keywords:** Cementum bone dysplasia, radiology, dentistry.

## 1 INTRODUCTION

Flowering cemento-osseous dysplasia is a benign condition and, in most cases, causes no symptoms. However, in some rare cases, there may be complications associated with the condition,



especially if it is not diagnosed early and treated appropriately (NAM et al 2022; BASTOS et al., 2022).

Dental treatment for flowering cemento-osseous dysplasia depends on the severity of the condition and the symptoms presented by the patient. In most cases, treatment is conservative and involves only regular monitoring of the condition. However, in more severe cases, more aggressive treatment may be needed. In more severe cases, treatment may include surgery to remove abnormal bone tissue, periodontal therapy to prevent gum inflammation, and even extraction of affected teeth (NAM et al. 2022).

Tooth loss due to periodontal disease progression is one of the potential complications of flowery cemento-osseous dysplasia. Gingival inflammation can develop around the affected teeth, which can lead to loss of bone tissue and loss of teeth (NAM et al 2022; KATO et al. (2020).

In addition, in rare cases, flowering cemento-osseous dysplasia can turn into a more serious condition, such as a cemento-ossifying fibro-osseous lesion or an adenomatous odontogenic tumor. These conditions may require more aggressive treatment, such as surgical removal of the affected tissue (BASTOS et al. 2022).

Thus, it is essential that patients undergo regular dental checkups to detect the condition early and monitor the progression of the disease. Early treatment can help prevent complications and preserve the patient's oral health (SOLUK-TEKKESIN et al 2022). Given this, it is possible to note the relevance of conducting a study that seeks to analyze the influence of radiographic examination and dental treatment of this condition.

Thus, this study aims to make a literature review on radiographic examination and dental treatments of patients with flowery cemento-osseous dysplasia.

## 2 METHODOLOGY

A systematic narrative review on flowering cemento-osseous dysplasia was performed. The searches were made in February 2023, in the database PubMed, Scielo, Lilacs and BBO and with the terms "*cemento-osseous*", "*dysplasia*" combined with the Boolean operator AND.

The inclusion criteria were: free complete studies, published from 2012 to 2022, in English and whose main focus was to analyze the importance of the radiographic diagnosis of flowery cemento-osseous dysplasia for dental treatments, preferably case series studies, cohort studies, retrospective and comparative. The exclusion criteria were: incomplete articles, duplicates, literature reviews, case reports (only one case), articles outside the chosen time range and studies that were not relevant to the theme.

The search strategy used "*cemento-osseous AND dysplasia*" found 147 articles in total. By filtering the free full texts 77. In the screening stage, after reading the titles, 37 remained and 14 of the



abstracts. Then, the complete reading of the works was made, and seven articles were selected at the end to compose the sample of this study.

### 3 RESULTS AND DISCUSSION

Seven articles were identified that address the radiographic examination and/or dental treatment of flowery cemento-osseous dysplasia. It was noted that the highest prevalence of this condition is in women, black women and over 30 years of age (chart 1).

Table 1. Articles that address the radiographic examination and/or dental treatment of flowery cemento-osseous dysplasia. 2023

Author(s)/year	Type of study	Goal	Findings	Conclusion
ARSAN (2022)	Comparative study	To compare mandibular cortical thickness (CTh) and fractal dimension (FD) in patients with cemento-osseous dysplasia (COD) and controls, measured with cone-beam computed tomography	The lower TC values were lower overall in COD patients than in controls ( $P = 0.01$ ), specifically in sCTh, mCTh, and pCTh ( $P \leq 0.042$ ). Alternate CTh was also significantly lower in the COD group ( $P = 0.005$ ). There was a significant correlation between lower and alternating CTh measurements ( $r = 0.636$ , $P < 0.001$ ). No significant differences were observed in cortical or trabecular FD between the groups ( $P \geq 0.072$ )	Female patients with COD had significantly lower and alternate hCT than healthy controls. Both groups had similar cortical and trabecular bone textures
BASTOS et al. (2022)	Case series	To evaluate the clinical-pathological characteristics of osteonecrosis related to flowery cemento-bone dysplasia (FCOD), highlighting its histopathological aspects and bone structure	The mandible was most affected by osteonecrosis related to FCOD. There was a predominance of black Brazilian women in the fifth and seventh decades of life. Osteomyelitis was present in 82% of the cases, while bone resorption and bacterial colonization were present in 100% of the cases of osteonecrosis related to FCOD. Thick basophilic lines were observed in all cases (100%). Actinomycosis and osteoclasts were not frequent	This study showed that the preference for female adults, mandibular location and some findings such as osteomyelitis, bone resorption and bacterial colonization were the most frequent histopathological features in FCOD-related osteonecrosis. In the absence of a close clinical and radiographic correlation, the morphology of the necrotized bone similar to cementum could help to recognize FCOD
SOLUK-TEKKESIN et al (2022)	Case series	To highlight the importance of clinical and radiological findings for the definitive histopathological	A total of 276 cases of BFOL were identified and reassessed for the study. The most common type of BFOL was cemento-osseous dysplasia ( $n =$	Our results document several clinical, radiological and histopathological findings of BFOLs. Even if some



		diagnosis of benign fibro-osseous lesions of the jaws	135), followed by cemento-ossifying fibroma (n = 77), fibrous dysplasia (n = 53) and juvenile ossifying fibroma (n = 11). The female/male ratio was 3.4:1 with a strong predilection for the 4th decade (n = 102). The mandible (n = 209) was the predominantly affected mandible. Prominent osteoblastic border around the bone lesion was commonly observed for cemento-ossifying fibroma (n = 60/77), followed by cemento-osseous dysplasia (n = 23/135). The predominant ossification patterns showed some differences between the groups. The most common radiological feature was the mixed radiolucent/radiopaque internal structure	histopathological differences are observed, clinical and radiographic correlation is mandatory before definitive histopathological diagnosis of BFOLs for the prevention of possible diagnostic errors or inadequate treatments
<b>KATO et al. (2020)</b>	Retrospective cross-sectional paired study	To compare the radiomorphometric parameters of the trabecular and cortical bone mandibular of women with and without cemento-osseous dysplasia (OCD)	The mean age of both groups was $46.84 \pm 11.38$ years. The average index of MCW was 3.12 mm (2.15–4.55) for the COD group and 3.52 mm (1.90–4.70) for the without COD ( $p = 0.034$ ). The mean FD value of the COD group ( $1.2039 \pm 0.0926$ ) was lower than the of the non-COD group ( $1.2472 \pm 0.0894$ ) in the anatomical region of interest of the mandibular cortical ( $p=0.031$ ), while no difference was detected in the alveolar trabecular bone. Grade C3 of MCI was more frequent in the COD group ( $p=0.009$ )	Women with COD had lower values of radiomorphometric parameters in the mandibular cortical bone than women of the same age without COD. These results suggest that, In addition to the dental care recommended in the literature, women with OCD also require more attention and screening for low bone mineral density
<b>KATO et al. (2020)</b>	Retrospective case series study	To describe a series of 66 cases of infected cemento-osseous dysplasia (OCD) and to discuss the demographic distribution, the clinical-radiographic characteristics and the	The case series study showed a female/male ratio of 21:1. The mean age of those affected was 57.4 years. The mandible was the most affected site (95.5%) and the flowering subtype was the most infected OCD	Clinicians, maxillofacial surgeons, and oral rehabilitation professionals should be attentive to the diagnosis of COD, since infection is a frequent complication,



		Treatment of this condition	frequent (62.1%). Tooth extraction was the main factor associated with the development of infection associated with a COD lesion. The literature review recovered 30 studies reporting 46 cases of this condition. Asian women in their 40s and 50s were more affected. Surgery for removal/curettage of necrotic bone has been recognized as an approach suitable for the treatment of this infection. The clinical-demographic data of the study were similar to the data collected in the literature	whose management is challenging
<b>NAM et al. (2022)</b>	Retrospective study	To evaluate risk factors and symptoms in patients with cemento-osseous dysplasia (OCD)	OCD was more prevalent in female patients. All but three cases were focal COD. Most patients presented symptoms when the lesion was smaller than 1.5 cm. Symptoms were observed when the apex of the tooth was included in the lesion or there was a local infection around the lesion. History of tooth extraction and previous endodontic treatment was assessed, and history was not a significant predictor for the onset of symptoms	OCD is a benign fibrous bone lesion and most cases are asymptomatic. However, if symptoms occur, surgical treatment is necessary. In this study, the risk factors associated with symptomatic patients were lesion size, apical involvement and local infection
<b>PICK et al (2022)</b>	Retrospective study	To evaluate the incidence of fibroosseous lesions and to reassess the efficacy of case-specific treatment management from a clinical, radiological and histopathological perspective based on 14 years of data	Forty-four patients with radiological and/or histopathological diagnosis of benign FOLs were identified and reassessed. Cemento-osseous dysplasia was the most common group of FOLs present in our cohort of patients (45%), followed by ossifying fibroma (39%) and fibrous dysplasia (16%). The diagnostic imaging technique of choice was CBCT (68%), followed by PAN (18%), with most patients (95%) being submitted in addition to biopsy. The mean age of the patients at the time of diagnosis was $40.54 \pm 13.7$ years, and most of the lesions were located in	An interdisciplinary approach that analyzes all case-specific factors, including demographics, medical history, intraoperative findings, and, most importantly, histopathological and radiological features, is essential for an accurate and key diagnosis to avoid inadequate treatment



			the mandible (86%), and the female sex was predominantly affected (73%)	
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Source: The Authors, 2023

Cemento-osseous dysplasia is a benign condition that affects bone tissue and the tissue that lines the roots of teeth (cementum). In cemento-osseous dysplasia, bone and/or cementum tissue is replaced with new abnormal bone and/or cementum tissue, resulting in dense, sclerotic areas in the bones of the jaw or maxilla. (BASTOS et al. 2022; SOLUK-TEKKESIN et al 2022)

The condition can be classified into three different types: periapical cemento-osseous dysplasia (PFCD), focal cemento-osseous dysplasia (DCOF), and flowery cemento-osseous dysplasia (DCOF). Flowering cemento-bone dysplasia is the most common form and can affect multiple areas of the jaw and maxilla. (BASTOS et al. 2022)

Cemento-osseous dysplasia can affect the planning and execution of orthodontic treatments and dental implants. In the case of orthodontic treatments, the presence of dense, sclerotic areas on the bones can make it more difficult to move the teeth and adjust the braces. The orthodontist should carefully evaluate the condition before starting any treatment and consider adjusting the treatment plan according to the location and severity of the cemento-osseous dysplasia. (PICK et al 2022; KATO et al. 2020; CONSOLARO et al., 2018)

In the case of dental implants, the presence of dense and sclerotic areas can hinder the placement of the implant and proper bone integration. The dentist should carefully evaluate the condition before starting the procedure and consider modifying the surgical technique to accommodate the affected area. (KATO et al. 2020; CONSOLARO et al., 2018)

In both cases, it is important to perform additional radiographic examinations to assess the extent and location of cemento-osseous dysplasia before initiating any treatment. Regular monitoring is also important to detect and treat any complications that may occur during or after treatment. (PICK et al 2022)

This pathology can affect the planning and execution of surgical dental treatments, especially in cases of more extensive injuries.

According to the study by Chrcanovic et al. (2015) cemento-osseous dysplasia can interfere with the planning and execution of bone grafts for the placement of dental implants. The authors reported a case in which the presence of cemento-osseous dysplasia in the maxillary region affected the local bone density and made it difficult to perform a bone graft for the placement of an implant. The surgical planning had to be modified to accommodate the condition and ensure a satisfactory result.



Another study, published by Liu et al. (2017), addressed the relationship between cemento-osseous dysplasia and mandibular fractures. The authors reported a case of a patient with cemento-osseous dysplasia who presented with a mandibular fracture after a mild trauma. The condition affected the bone density of the jaw and made the fracture more difficult to treat. The authors highlighted the importance of careful evaluation of cemento-osseous dysplasia before any surgical procedure on the jaw.

In addition, a study published by Hodzovic et al. (2019), discussed the surgical treatment of cemento-osseous dysplasia in patients with severe symptoms. The authors reported that cemento-osseous dysplasia may present symptoms such as pain, swelling and loss of sensation, and that in severe cases, it may be necessary to perform surgical removal of the affected area. The study highlighted the importance of careful assessment of the condition to determine the best course of surgical treatment.

#### 4 FINAL CONSIDERATIONS

Dental treatment for flowering cemento-osseous dysplasia depends on the severity of the condition and the symptoms presented by the patient. One of the potential complications of flowering cemento-osseous dysplasia is tooth loss due to periodontal disease progression.

The dentist should carefully evaluate the initial examinations of each patient before starting any treatment and consider the possibility of adjusting the treatment plan according to the diagnosis, location and severity of cemento-osseous dysplasia. In cases of dental implants, the presence of dense, sclerotic areas can hinder implant placement and proper bone integration.

It is recommended to perform periodic radiographic examinations to evaluate the extent and location of cemento-osseous dysplasia in the course of dental treatments.



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