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(CASE REPORT)

Radiographic Progression of Focal Cemento-Osseous Dysplasia in 10 years: A Case Report

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Abstract

Fibro-cemento-osseous dysplasias are benign fibro-osseous lesions that develop when normal bone tissue is replaced by fibrous tissue and cement-like structures. These lesions are generally asymptomatic and occur more frequently in women. Initially, the lesions appear radiolucent on radiographs, but they gradually acquire a mixed radiolucent-radioopaque appearance. In advanced stages, the lesions transform into radioopaque structures surrounded by a thin radiolucent band. This case report presents the 10-year radiological evolution findings of a 45-year-old female patient with focal cemento-osseous dysplasia. The dysplasia was incidentally detected in the right posterior mandibular region during a routine dental examination. The findings reveal the lesion's characteristic radiological evolution with enlargement of the radioopaque aspect and its clinically asymptomatic course.

Keywords: Focal cemento-osseous dysplasia; Fibro-osseous lesions; Mandible; Dysplastic Lesions of the Jaws; Radiolographic progression

1. Introduction

Fibro-cemento-osseous dysplasia is a group of benign lesions that are characterized by the replacement of normal bone tissue with fibrous tissue and cementum-like structures. These lesions develop slowly. These lesions are usually asymptomatic, and the adjacent teeth remain vital with no observed expansion of the jaws. However, secondary infection may present clinical findings such as pain and expansion [1].

Semento-osseous dysplasias initially exhibit a radiolucent appearance in the osteolytic phase. In advanced stages, the lesion transforms into a mixed radiolucent-radioopaque structure (the cementoblastic phase), and subsequently shows a completely radioopaque appearance (the osteogenic phase), surrounded by a thin radiolucent peripheral band. During this phase, an increasing amount of sclerotic, cement-like, avascular tissue accumulates [2]. 53% of lesions have distinct borders, and 40% of these cases have a sclerotic periphery [3].

Semento-osseous dysplasia is classified into three subtypes based on anatomical location and degree of involvement: periapical, focal, and florid. The 2022 World Health Organization (WHO) classification defines familial florid semento-osseous dysplasia as a fourth subtype [4].

Periapical cemento-osseous dysplasia (PCOD) is typically observed in the anterior region of the mandible, at the apices of vital teeth and in foci smaller than 0.5 cm. While it can affect a single tooth, it is most often observed in multiple foci. PCOD lesions may appear radiolucent, mixed, or radiopaque on radiographs and are often surrounded by a thin radiolucent band. Their diameter rarely exceeds 1.0–1.5 cm, and their limited growth supports the non-neoplastic nature of the lesion [5].

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Florid cemento-osseous dysplasia (FLCOD) is characterized by bone lesions that affect multiple quadrants of the jaw. It is the most common form. The lesions are primarily bilateral in the mandible, and simultaneous involvement of the maxillary region may also be observed in some cases. While most FLCOD cases have been reported in individuals over 45 years of age, it can also occur in younger age groups. These lesions are usually asymptomatic and show a symmetrical distribution. Radiographically, they are characterized by multiple radiopaque foci that are not fused or expansive and are surrounded by a thin radiolucent band [7].

Focal cemento-osseous dysplasia (FCOD), first described by Summerlin and Tomich, is primarily classified based on the location of the dysplastic areas in the bone. It typically presents as a single, focused lesion in the posterior alveolar region. The average diameter of these lesions is approximately 1.5 cm, and they are most commonly observed in the mandible. Clinically, FCOD is usually asymptomatic and does not cause jaw expansion [5]. Radiographically, FCOD progresses through three stages: early, intermediate, and late. In the early stage, the lesion appears as a well-defined radiolucency at the apices of the mandibular teeth. At this stage, it may be confused with other radiolucent lesions during diagnosis. In the intermediate stage, the lesion has a mixed radiolucent-radioopaque appearance with a distinct radiolucent band around it. In the late stage, diffuse radioopacity develops, usually taking on an irregularly bordered form.

This case report presents the clinical and radiological evaluation of a patient with focal cemento-osseous dysplasia and findings regarding the long-term course.

2. Case report

A 45-year-old female patient with no systemic diseases came to the Department of Oral and Maxillofacial Radiology at the Faculty of Dentistry at İzmir Katip Çelebi University for a routine dental exam and follow-up on a previous root canal treatment in the right mandibular region due to a history of pulpitis.

No findings were observed during the extraoral examination. The intraoral examination revealed normal appearance of the tongue, gums, cheeks, and lip mucosa.

The patient has composite restorations on the right mandibular first premolar and the first and second molars. The patient reported that food gets stuck between these teeth while eating and that they are sensitive to hot and cold. Panoramic and periapical radiographs revealed a fracture in the filling material of the endodontically treated right mandibular first molar, as well as secondary caries closely related to the pulp in the right mandibular second premolar. Additionally, a well-defined lesion with a radiolucent band around it and irregular radiopaque areas in the center was detected around the roots of the right mandibular first molar (Figure 1).

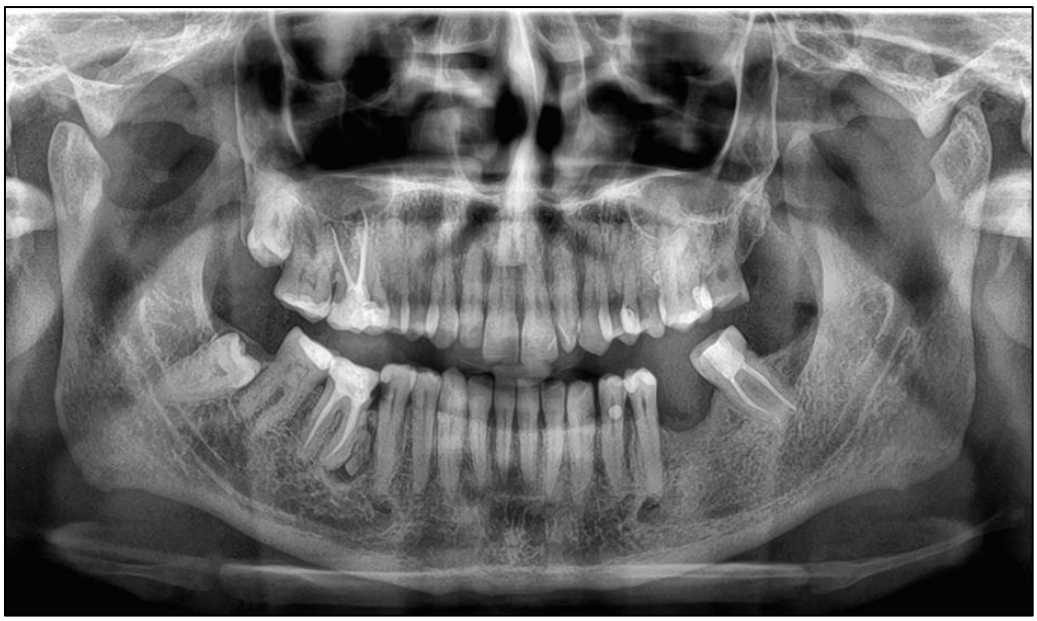

Figure 1 Panoramic radiograph, taken in 2025, shows a mixed area of radiolucent and radio-opaque tissue surrounded by a radiolucent line in the posterior region of the right mandible

The patient's old panoramic and periapical radiographs were reviewed retrospectively from the hospital archives. Measurement analyses were performed on these images to objectively evaluate changes that occurred over time.

The images were calibrated to eliminate magnification from the numerical expression of the total lesion size and change in the radiopaque area over time. For this calibration, the distal apex-tubercle distance of tooth 46 was measured as a pixel value on the periapical films, and the ratio of b to c was recorded as the magnification factor. Then, vertical and mesiodistal measurements of the lesion's total size and the radio-opaque area were taken. The resulting values were interpreted according to their relationship with the magnification factor (Figures 2–5). These findings are consistent with the morphological changes observed in the natural course of fibro-osseous lesions.

Figure 2 Patient's panoramic radiograph taken in 2015

Figure 3 Patient's panoramic radiograph taken in 2022

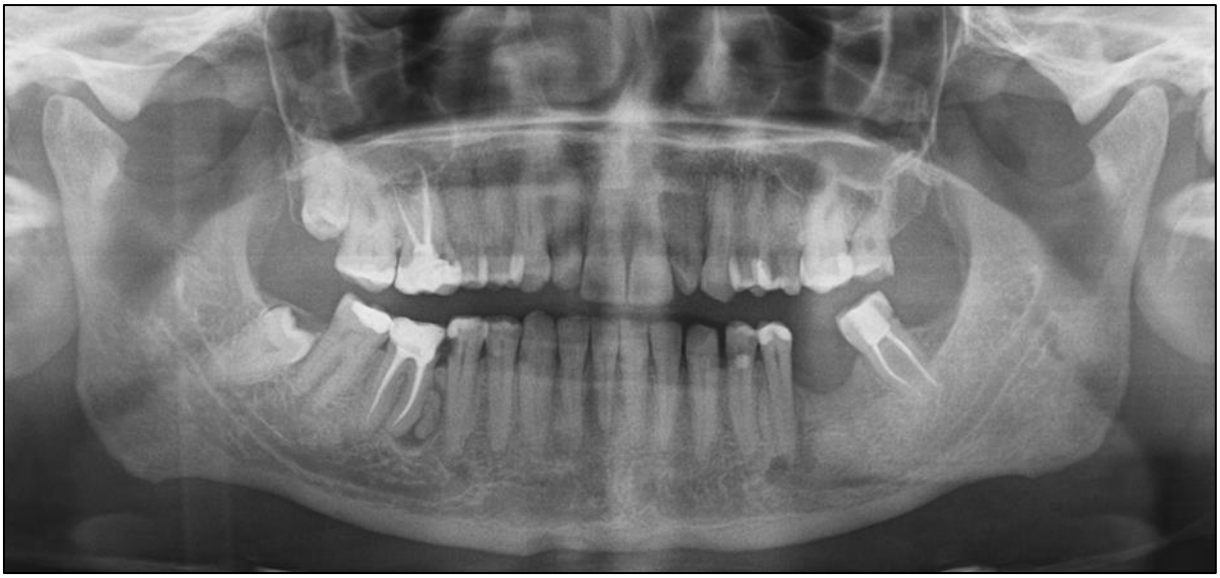

Figure 4 Patient's panoramic radiograph taken in 2024. Over time, the lesion is seen to increase in radio-opacity, with a radiolucent border around it

Figure 5 Periapical radiographs of tooth number 46 taken in 2015, 2017, and 2025. The image series show an increase in the size and radiopacity of the lesion

The images were calibrated to eliminate magnification errors in the numerical expressions of total lesion size and change in radio-opaque area over time. For this simple calibration, the distal apex-tubercle distance of tooth 46 was measured as a pixel value on the periapical films, and the ratio of b to c to a was recorded as the magnification factor. Then, vertical and mesiodistal measurements of the total lesion size and radio-opaque area were taken. The resulting values were interpreted according to their relationship with the magnification factor. No difference was found in the total lesion size between the 2017 and 2015 images. Between 2025 and 2015, however, the lesion increased vertically by 27% and mesiodistally by 10%. The radio-opaque area within the lesion increased by 217% between 2017 and 2015 and by 370% between 2025 and 2015. The mesiodistal growths were limited to 16% and 29%, respectively.

Based on the current clinical and radiological findings, the lesion was assessed as being consistent with focal cemento-osseous dysplasia. Since the patient did not exhibit any palpation or percussion sensitivity in their right mandibular first molar, the lesion was monitored after informing the patient about, general characteristics of the lesion; the poor cellular and healing capability, tendency to seconder osteomyelitis. The patient's symptoms were originated from the right mandibular second premolar tooth, hence, was referred to the appropriate clinic for treatment.

3. Discussion

The etiology of focal cemento-osseous dysplasia remains unknown. The most widely accepted view is that the lesion originates from the periodontal ligament. Although trauma, caries, periodontal disease, infection, or systemic diseases have been suggested as potential triggers, this has not been conclusively proven [9].

FCOD is generally asymptomatic and self-limiting. It is usually detected incidentally during routine dental examinations, and patients rarely report symptoms such as pain or gingival swelling [10]. The lesion in the present case is also asymptomatic.

Approximately 88% of FCOD cases occur in women, with an average age of diagnosis of 41 years. The majority of lesions are located in the mandible (85%), particularly in the posterior regions (80%). Maxillary involvement is rare and, when present, usually occurs in the posterior regions [3]. The presented case was observed in a female patient in her 40s in the region of the right first molar tooth of the mandible. These findings are consistent with the typical distribution described in the literature.

Approximately half of the lesions occur in dentate areas (49%), while the other half occur in edentulous areas (51%). In dentate areas, tooth displacement or root resorption is generally not observed [3]. Similarly, in the presented case, no root resorption or displacement was detected in the relevant teeth.

Studies have reported that the specific radiographic features of FCOD are mainly revealed by intraoral periapical radiographs and orthopantomograms (OPGs), and that these methods are considered sufficient for the diagnosis of most FCOD lesions [11].

FCOD is mostly asymptomatic and therefore does not require specific treatment [12]. While the fibroblastic component is predominant in the early stages of the lesion, it transforms into an osteo-cementoid structure in the middle and advanced stages, acquiring a hypovascular and densely mineralized stroma. This increases susceptibility to infection [13]. As a result, periodontal disease, periapical pathologies, trauma from removable prostheses, and inflammation triggered by surgical procedures can lead to acute osteomyelitis with bone sequestration and fistula formation. It has been reported that surgical interventions in such lesions can lead to serious complications such as purulent discharge, fistula formation, and bone sequestration; these complications are particularly associated with the predominantly avascular nature of the tissue in mature lesions [5].

Therefore, invasive procedures, including biopsy, are not indicated in asymptomatic cases. Due to the risk of post-procedural infection, clinical and radiological evaluation with regular follow-up should be preferred. This approach ensures proper management by reducing the risk of complications. Furthermore, as part of the regular follow-up process, ensuring and reinforcing oral hygiene contributes to the prevention of local infections. [14,15].

4. Conclusion

Focal cemento-osseous dysplasia (FCOD) is a lesion that is often detected incidentally due to its asymptomatic course and characteristic radiological features. However, an accurate diagnosis and regular follow-up are required. A careful evaluation of clinical and radiological findings is important for diagnosis to avoid unnecessary treatment attempts. This case contributes to the literature by demonstrating the lesion's characteristic development and asymptomatic course through evaluation of radiological changes over a ten-year period.

Compliance with ethical standards

Disclosure of conflict of interest

The authors have nothing to disclose.

Statement of informed consent

Informed consent was obtained from all individual participants included in the study.

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