

Case Report

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Infected Cemento-Osseous Dysplasia following Dental Implant Placement - Report of Two Cases



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Abstract

Objective: This study reports two cases of secondary infection associated with focal cemento-osseous dysplasia (COD) following dental implant placement and discusses their clinical, radiographic, and therapeutic outcomes.

Case presentation: Two middle-aged female patients developed persistent signs of infection after dental implant placement in the posterior mandible. Clinical examination revealed facial swelling and intraoral fistulas with purulent discharge. Imaging included panoramic radiography and cone-beam computed tomography (CBCT), which demonstrated well-defined hyperdense lesions with hypodense halos surrounding the implants. Surgical management consisted of excisional biopsy of the lesions and simultaneous removal of the implants under general anesthesia. Postoperative antibiotic therapy with amoxicillin (500 mg every 8 hours for 7 days) was prescribed. Histopathological analysis was performed to confirm the diagnosis.

Conclusion: Dental implant placement in areas affected by COD may precipitate secondary infection and implant failure. Due to the poor vascularization and reduced regenerative potential of these lesions, elective surgical procedures should be avoided in affected bones. When infection occurs, surgical removal of necrotic tissue and implants is required, as antibiotic therapy alone is often insufficient. Careful radiographic assessment is essential to prevent implant-related complications in patients with COD.

Keywords: Cemento-osseous dysplasia, Dental implant, fibro-osseous lesion, Infection

Abbreviations: COD: Cemento-osseous dysplasia; FOL: fibro-osseous lesion; DI: dental implant; CBCT: Cone-beam computed tomography; WHO: World Health Organization

Introduction

Cemento-osseous dysplasia (COD) is a benign fibro-osseous lesion (FOL) in which normal bone is replaced by fibrous and cementum-like tissue. COD typically presents as an asymptomatic intraosseous lesion, commonly detected during routine radiographic examinations, and predominantly affects middle-aged women [1-3]. Symptoms such as pain and facial edema may develop secondary to infection, particularly following

chronic or surgical trauma, such as dental implant (DI) placement [1]. Radiographically, COD initially appears as a well-defined radiolucent lesion; however, with maturation and deposition of non-vascularized, cementum-like tissue, the lesion becomes progressively radiopaque [3]. COD is classified into: focal COD (FCOD), associated with a single posterior tooth; periapical COD (PCOD), usually associated with the apical regions of the anterior

mandible; and florid COD (FLCOD), characterized by multifocal involvement [4].

Although the diagnosis can often be established through imaging examinations, other conditions such as Paget's disease and osteopetrosis may present similar features; therefore, histopathological examination may be required to confirm the diagnosis [5]. Histologically, the lesion shows necrotic tissue characterized by loss of osteocytes and replacement of bone marrow by amorphous material and inflammatory infiltrate.

Consequently, COD usually does not require active treatment and may be managed with periodic radiographic follow-up. However, the poor vascularization and reduced regenerative capacity of the affected bone may predispose infection and necrosis of the surrounding tissues when bone is manipulated or when dental infection or trauma occurs. Elective surgical procedures should therefore be contraindicated in patients diagnosed with COD [6]. Herein, we report two cases of secondary infection associated with focal COD following dental implant placement in the mandible, and describe their clinical, radiographic, and treatment outcomes.

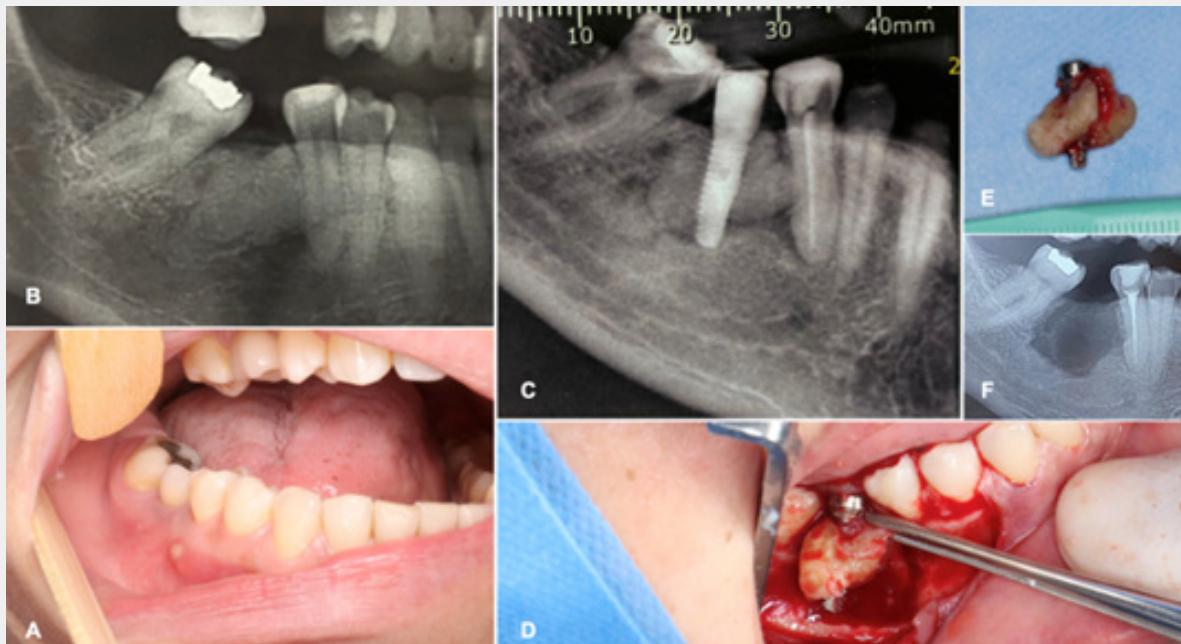


Figure 1: Infected focal COD presenting a gingival fistula. A, Intraoperative fistula located adjacent to the lower right second premolar with purulent discharge. B, Initial panoramic radiograph demonstrating a well-defined, asymptomatic radiopaque lesion in the region where the dental implant (DI) was installed. C, CBCT panoramic reconstruction showing the presence of a hyperdense lesion surrounded by a hypodense halo after dental implant placement, leading to secondary infection. D,E Both the lesion and the DI were removed under general anesthesia. F, Latest radiographic follow-up demonstrating bone healing and absence of residual lesion or infection.

Case Report

Case 1

A 40-year-old woman presented with a two-month history of recurrent facial swelling following dental implant placement in the lower right first molar region. Her medical history was non-contributory, and no deleterious habits were reported. Extraoral examination revealed a mild, tender swelling on the right side of the face. Intraoral examination showed a fistula located on the buccal gingiva adjacent to the right mandibular second premolar (Figure 1A). Panoramic radiography revealed a well-defined, unilocular radiopaque lesion in the right posterior mandible (Figure 1B).

specifically in the first molar region, where a dental implant had been placed. Cone-beam computed tomography (CBCT) demonstrated a dental implant located within a hyperdense lesion surrounded by a hypodense halo (Figure 1C). The differential diagnosis included infected focal cemento-osseous dysplasia, and both the lesion and the implant were surgically removed under general anesthesia (Figure 1D-E). Postoperatively, antibiotics were prescribed for 7 days (amoxicillin 500 mg every 8 hours). The specimen was submitted for histopathological analysis, which confirmed the diagnosis of COD. Clinical, radiographic, and microscopic findings supported the diagnosis of infected focal COD. At the most recent follow-up, no recurrence or signs of infection were observed (Figure 1F).

Case 2

A 49-year-old woman was referred for evaluation of a persistent intraoral fistula of six months' duration, which developed after dental implant placement in the mandible. Her medical history was unremarkable, and she denied tobacco and alcohol use. Extraoral examination showed no abnormalities; however, intraoral examination revealed a gingival fistula with purulent discharge in the lower right first molar region (Figure 2A). A previous panoramic radiograph showed a well-defined, unilocular radiopaque lesion in the right posterior mandible (Figure 2B).

CBCT images demonstrated a well-defined hyperdense area associated with a hypodense halo, located inferior to the installed dental implant (Figure 2C). The clinical diagnosis was secondary infection associated with COD. An excisional biopsy and removal of the dental implant were performed under general anesthesia, and the specimen was submitted for histopathological analysis. Postoperative antibiotic therapy consisted of amoxicillin 500 mg every 8 hours for 7 days. Histological examination confirmed the diagnosis of focal COD. At the most recent follow-up, no recurrence or signs of infection were observed (Figure 2D).

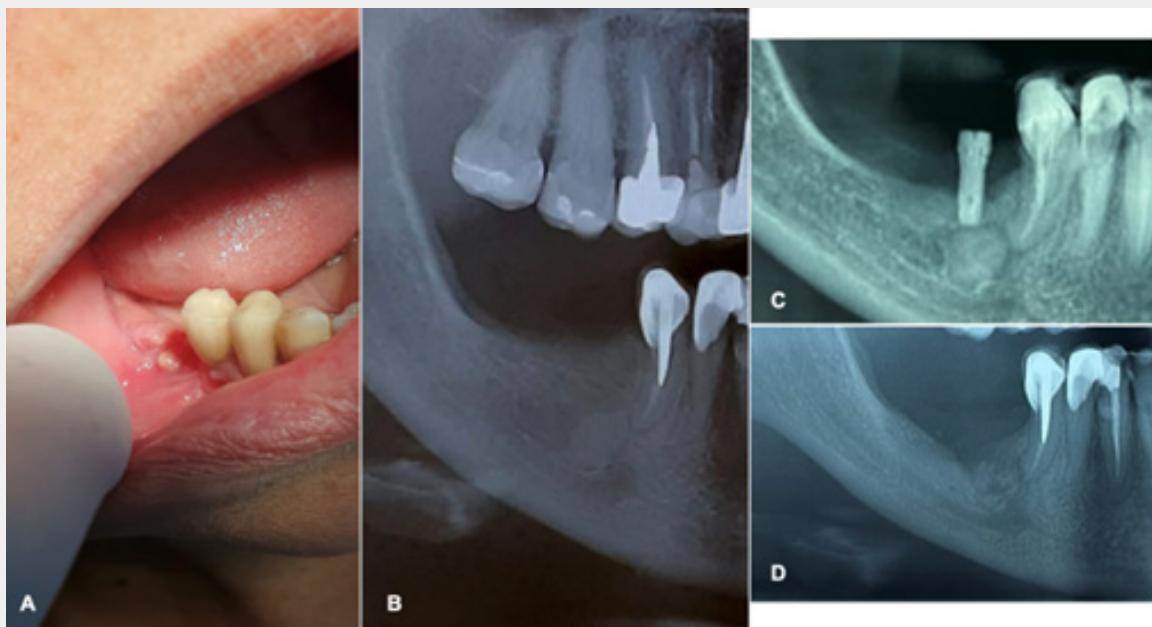


Figure 2: Infected focal COD following dental implant placement. A, Intraoperative fistula located in the lower right first molar region. B, Initial panoramic radiograph showing a well-defined radiopaque lesion in the molar region. C, CBCT panoramic reconstruction showing DI placement within the lesion area. D, Postoperative radiographic exam demonstrating bone healing and absence of infection after the removal of both lesion and DI.

Discussion

First described by Melrose et al. [7] in 1976, the term "periapical cemental dysplasia" had been proposed earlier by Brophy in 1915 [8]. The World Health Organization (WHO) classification of odontogenic and maxillofacial bone tumors [4] defines cemento-osseous dysplasia (COD) as a fibro-osseous lesion typically associated with tooth-bearing areas of the jaws and lacking any neoplastic component. This classification recognizes three subtypes: periapical, focal, and florid. COD shows a marked female predilection and most commonly affects patients in their fourth and fifth decades of life, particularly individuals of African or East Asian descent [9]. It usually presents as an asymptomatic lesion with radiolucent and/or radiopaque features, depending

on the stage of maturation, and is most often detected during routine radiographic examinations [1-9]. In the present study, both cases were consistent with the literature, as the lesions occurred in women in their fifth decade of life. However, secondary infection following dental implant placement led to persistent local infection, characterized by fistula formation, swelling, and purulent discharge.

When COD is identified on routine radiographic examination, elective surgical procedures—including tooth extractions, periodontal surgery, and implant therapy—should generally be avoided. Thermal trauma during osteotomy preparation, combined with poor vascular supply and reduced regenerative potential of the affected bone, increases the risk of infection and subsequent tissue necrosis. Furthermore, due to the avascular nature of these

lesions, the effectiveness of systemic antibiotics is often limited [6,10–11]. In the cases presented, radiopaque lesions had been previously identified on panoramic radiographs. Such findings should be carefully evaluated, and implant placement should be avoided in these areas, given the risk of secondary infection and eventual implant failure. Both patients were maintained on prolonged antibiotic regimens before definitive surgical treatment, with persistence and recurrence of infection. In such situations, removal of the dental implant and surgical drainage of the infection are necessary [10,13].

Conclusion

The management of infected COD is particularly challenging due to the limited vascularity of the lesion and the frequent development of intraoral or extraoral fistulas. Antibiotic therapy alone is often insufficient, as necrotic bone (sequestra) must be surgically removed. In addition, when the source of infection is associated with a dental implant, the implant should be removed during surgery to eliminate the etiologic factor. Finally, when oral rehabilitation is required, affected COD areas should be avoided, with implants placed only in normal bone or with the use of removable prostheses.

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