

## Focal Cemento-osseous Dysplasia

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### ABSTRACT

Focal cemento-osseous dysplasia (FCOD) is a benign fibroosseous condition that can be seen in dentulous and edentulous patients. It is an asymptomatic lesion and needs no treatment; however, follow-up is essential due to the possibility that it can progress to a condition called florid cemento-osseous dysplasia. Clinically, the lesion resembles periapical pathosis of odontogenic origin. FCOD is an asymptomatic lesion and occurs in the periapical area of teeth with vital pulps or in regions of extractions. The lesion is detected only on radiographic examination varying from completely radiolucent to densely radiopaque. The histopathologic appearance consists of trabeculae of bone and cementum like material present within a vascular fibrous stroma. Presented here is a case of FCOD in the mandible that occurred in the periapical region of a vital tooth.

**Keywords:** Fibroosseous lesions, Cemento-osseous dysplasia, Jaws.

**How to cite this article:** Kadam R, Patel S, Pathak J, Swain N, Kumar S. Focal Cemento-osseous Dysplasia. *J Contemp Dent* 2013;3(2):112-115.

**Source of support:** Nil

**Conflict of interest:** None declared

### INTRODUCTION

Benign fibroosseous lesions are rare diseases which are characterized by replacement of healthy bone and connective tissue that transforms to cemento-osseous tissue.<sup>1</sup> Fibroosseous lesions can be classified in three categories as fibrous dysplasia, benign fibroosseous neoplasms and reactive lesions.<sup>1</sup> The term cemento-osseous dysplasia is a non-neoplastic lesion related to teeth bearing area. The term cemento-osseous dysplasia was used first time for the World Health Organization (WHO) classification in 1992.<sup>2</sup> It is used because of its difficulty in discrimination of cementum and bone tissue in lesions which produce cementum, bone and connective tissue. Cemento-osseous dysplasias are non-neoplastic lesions which include periapical osseous dysplasia, focal cemento-osseous dysplasia (FCOD) and florid cemental dysplasia.<sup>3</sup>

Focal cemento-osseous dysplasia (FCOD) is seen predominantly in African-American females, with a peak incidence in the fourth and fifth decades. FCOD affects edentulous jaws and tooth extraction sockets attaining 1 to 2 cm size in dimensions. FCOD can cause expansion of the surrounding bone and can be secondarily infected.<sup>4-6</sup>

It is mostly a well-defined radiolucency with a sclerotic border or a mixed radiolucent and radiopaque lesion.<sup>4</sup> Histopathologically, FCOD is formed by spindle cells, bone-cementum like trabeculation and connective tissue stroma.

Histopathological view varies due to the stage of the lesion. In the early osteolytic stage, cellular and vascular structures are predominant and surrounded by a proliferated fibrous connective tissue stroma.<sup>4,5</sup> Cementum-like structures cannot be seen.<sup>4,5</sup> In the late osteosclerotic stage, the lesion reveals poor cellularity, bony trabeculae and irregular cementum-like structures making anastomosis with each other. There is no evidence of cementoblastic and osteoblastic rimming.<sup>4-6</sup> Mid stage consists of both early and late stage characteristics. FCOD does not require treatment and certainly not routine biopsy unless it is infected and symptomatic.<sup>4,7</sup>

In this report, we present a case of a 13-year-old female patient with the lesion on the right mandibular molar region diagnosed as FCOD by histopathological and radiological examination.

### CASE REPORT

A 13-year-old female patient reported to Department of Oral Pathology, MGM Dental College and Hospital, with the complaint of pain and swelling on right side of lower jaw since 9 to 10 months.

Patient apparently had no lesion 9 months back. Since last 7 to 8 months, patient complains of a small painful swelling in relation to 45, 46 and 47 which has gradually increased to the present size. The pain associated with the swelling was intermittent in nature. There were no aggravating or relieving factors in association with the present growth. Extraoral examination revealed a diffuse small swelling on lower right posterior side of mandible (Fig. 1).

Intraoral examination revealed a diffuse swelling on mandibular right posterior region approx. 2 × 3 cm in size and irregular in shape with ulcerated surface. Extent of the



Fig. 1: Extraoral appearance of swelling

swelling was from the mesial aspect of lower right first premolar to mesial aspect of lower right second molar. On palpation, inspeitory findings were confirmed. Consistency of the swelling was firm to hard along with bicortical expansion and tenderness. There was no grossly decayed tooth in relation to the swelling (Fig. 2).

For the presenting complaint, an OPG was taken which revealed a small well defined mixed radiolucent-radiopaque lesion approx. 2 × 3 cm in size, in the lower right posterior region extended anteroposteriorly from the mesial root of the second premolar to the mesial root of the second molar (Fig. 3). Considering the clinical features and radiological findings, a provisional diagnosis of odontogenic cyst, tumor and benign fibroosseous lesions was made.

After surgical exposure, an excisional biopsy was done from the lesional tissues in region of 45, 46 and 47, which was sent for histopathological analysis (Fig. 4).

Histopathologically, H&E stained decalcified section shows trabeculae of woven bone and cementum-like tissue

with reversal lines in hemorrhagic connective tissue stroma. Numerous small blood vessels along with few chronic inflammatory cells are seen. No evidence of cementoblastic and osteoblastic rimming. The overall histopathological features were suggestive of focal cemento-osseous dysplasia (Figs 5 to 7).

## DISCUSSION

Waldron defined FCOD as an ‘abnormal reaction of bone to the injury due to its significant presence at extraction sites’<sup>4</sup>. FCOD was first reported as ‘localized fibroosseous cemental lesion’ by Waldron, later it was renamed as focal cemento-osseous dysplasia and its features were described by Summerlin and Tomich.<sup>4</sup>

FCOD is a common fibroosseous lesion of the jaws which can be described as fibroosseous condition in reaction to the local injury.<sup>8</sup> The affected area undergoes changes from normal vascular bone into avascular cementum-like lesion. As these lesions look similar histopathologically with



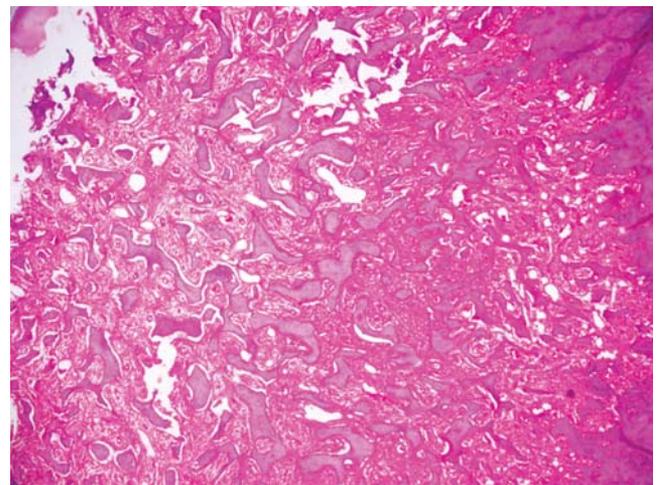
**Fig. 2:** Intraoral view shows a diffuse swelling with ulcerated surface in mandibular right posterior region



**Fig. 4:** Gross specimen of tissue excised



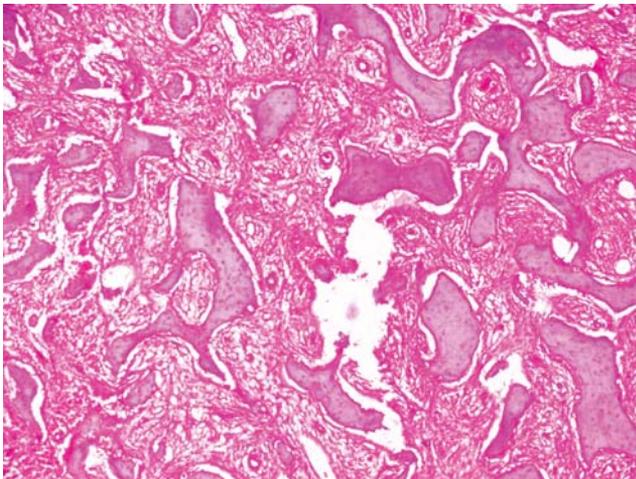
**Fig. 3:** OPG shows a small well defined mixed radiolucent radiopaque lesion



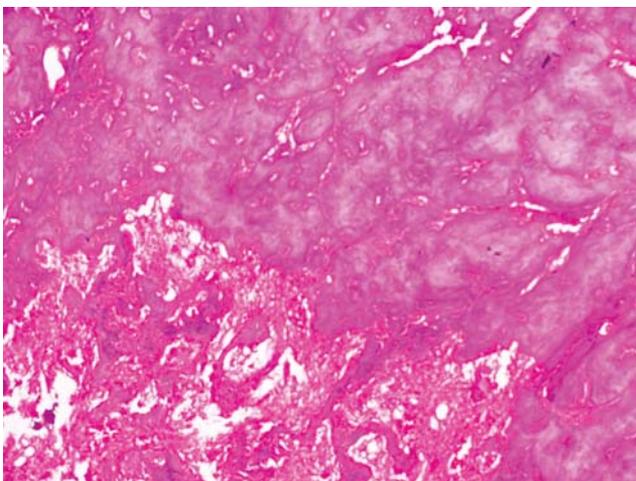
**Fig. 5:** H&E (40x) stained decalcified section shows trabeculae of woven bone and cementum-like tissue in a connective tissue stroma

cementum-like structures, these lesions are considered to be periodontal in origin.<sup>8</sup> Robinson in 1956 believed that local injury plays an important role in the form of occlusal forces causing fibrous replacement of existing bony trabeculae and subsequent formation of immature bone and cementum-like deposits.<sup>9</sup> Some believed that it is a developmental condition.<sup>9</sup> In our case, there was no history of trauma which indicates that lesion may be developmental in origin. This condition is strictly localized to the tooth bearing area and not associated with any other skeletal tissue.<sup>9</sup> In our case, it was seen in relation to 45, 46 and 47. FCOD has a female predilection and commonly occurs between 3rd and 5th decades. Although our case was in accordance with gender predilection, it was seen at an early age (13 years).

FCOD has been described as having three developmental stages, each with specific radiographic features. In the early or osteolytic stage, radiographs show a well-defined



**Fig. 6:** H&E (100×) stained decalcified section shows trabeculae of woven bone and cementum in connective tissue stroma



**Fig. 7:** H&E (400×) stained decalcified section shows trabeculae of woven bone and cementum-like tissue without osteoblastic/cementoblastic rimming with reversal lines in the connective tissue stroma

radiolucent area with loss of periodontal ligament and lamina dura.<sup>10,11</sup> In the intermediate or cementoblastic stage, small opacities appear within the radiolucent area which consequently displays a mixture of radiolucent and radiopaque architecture. This is because of the deposition of cementum-like droplets in the fibrous tissue.<sup>11</sup> The last mature, osteosclerotic and ‘inactive’ stage is characterized by a definite radiopacity, present in the major part of the lesion.<sup>11</sup> The differential diagnosis should consider the stage of development of the lesion and include periapical granuloma or cyst and chronic osteomyelitis in the osteolytic stage,<sup>12,13</sup> whereas in the mixed and radiopaque stages, chronic sclerosing osteomyelitis, ossifying/cementifying fibroma, odontoma and osteoblastoma.<sup>10,12,13</sup> The present case represented the intermediate or cementoblastic stage showing a mixture of radiolucent and radiopaque regions.

On microscopic examination, FCOD is found to exhibit fragments of fibrous tissue with numerous irregular bony and cemental calcifications.<sup>11</sup> The fibrous tissue is composed of spindle-shaped fibroblasts and collagen fibers with numerous small vessels.<sup>11</sup> In the present case, trabeculae of woven bone and cementum-like tissue were present with reversal lines in a hemorrhagic connective tissue stroma. In some areas, very few chronic inflammatory cells were observed. Trabeculae of lamellar bone and cementum-like material were intermixed throughout the fibrous framework. There was no evidence of cementoblastic and osteoblastic rimming which is the characteristic of FCOD.<sup>11</sup> The overall histopathological features were suggestive of FCOD.

No treatment is required for FCOD and follow-up is essential due to the possibility that it can progress to a condition called florid cemento-osseous dysplasia.<sup>14</sup> However in our case, surgical excision was done as the patient was symptomatic complained of pain and the lesion was secondarily infected.

## CONCLUSION

Periapical pathoses presents as a wide spectrum of lesions that may mimic each other. FCOD is usually found in the periapical region. The case presented is unusual because of its early age of occurrence and it was symptomatic which warranted treatment unlike postulated in literature. This case highlights the necessity to consider differential diagnosis in doubtful cases.

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