Incidental Finding Of Jaw Lesions- A Case Report And Its Review Of Literature
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Abstract
We report a case of a lesion in the dentulous area of the mandible with previous history of trauma to that region. The importance of the diagnosis is discussed.

INTRODUCTION
The architectural arrangement in the jaws (Maxilla & Mandible) of various hard tissues with differing densities have masked the accurate interpretation of radiographs. This problem is further accentuated by the rare but invariably seen incidental finding of tumors in the jaws. Incidental lesional findings are observed in routine radiographic examination and most of this falls in the spectrum of fibro-osseous lesions. Benign fibro-osseous lesions are disturbances in bone metabolism where normal bone is replaced by a connective tissue matrix that gradually develops cemento-osseous tissue. The fibro-osseous lesions represent a large group of disorders that have many common characteristics including clinical, radiographic and microscopic features. The classification of fibro-osseous lesions of the jaws has long been an area of consternation for pathologists and clinicians' alike. Currently, no universally accepted classification exists, although several nosologic schemes have been proposed. These classifications are based primarily on radiographic or histologic features and divide the fibro-osseous lesions into broad divisions- reactive and neoplastic. Lesions in this category include fibrous dysplasia, focal and florid cemento-osseous dysplasias as well as periapical cemental dysplasia. Many terms have been used to refer to cemento-osseous dysplasia (COD) of the jaws; they include periapical cemental dysplasia, florid osseous dysplasia, florid cemento-osseous dysplasia, focal cement-osseous dysplasia, and gigantiform cementoma. The term cemento-osseous dysplasia was adopted for the World Health Organization (WHO) classification in 1992 as a representative designation for a group of these osseous dysplasias. All these lesions are discovered during adult life as incidental radiographic findings, often without any attendant symptoms or obvious clinical abnormalities. Adjacent teeth are characteristically vital at pulp testing.

Although most are of unknown etiology, some are believed to be neoplastic and others are related to metabolic imbalance. The etiology and pathogenesis of cemento-osseous dysplasia remain unknown, although many have supposed an origin from the periodontal ligament. The cause of this disease has been attributed to a reaction of the bone to a local low-grade or chronic injury, in the form of abnormal occlusal forces, and this hypothesis has probably persisted simply because no better explanation has been offered. In 1994, the term focal cemento-osseous dysplasia was suggested by Sumnerlin and Tomich based primarily on location of the cemental dysplasia. Tooth-bearing areas of posterior jaws, particularly in extraction sites, were described as common sites for focal cemento-osseous dysplasia.

By combining all available clinical, surgical, radiographic, and histologic features of selected fibro-osseous lesions, a distinct clinicopathologic entity became apparent and the term “Focal Cemento-osseous Dysplasia (FCOD) was chosen for this entity.”

We are highlighting an unusual case of FCOD, diagnosed in a dentulous patient co-incidentally found in relation to trauma.

CASE REPORT
A 36 yr old male patient reported to the OPD with a chief complaint of severe pain and fractured jaw with a history of...
Incidental Finding Of Jaw Lesions- A Case Report And Its Review Of Literature

trauma 10 days back. No contributory medical, family or personal history was elucidated. On Extra-Oral examination patient presented bilateral asymmetry of face (Fig. 1). Due to fractured jaw, the patient had limited mouth opening and so on minimal intra oral examination a diffuse swelling was observed on right anterior mandibular region and also 46 was found fractured.

**Figure 1**
Fig. 1: Extra-oral photograph showing swelling which led to facial asymmetry.

The patient was attended immediately and it was decided to carry out an intermaxillary fixation. The OPG done, revealed mixed radio-opacity & radiolucency present in the region of the right mandible along with the fracture of the left angle of the mandible, right condyle and right parasymphyssis. An Occlusal view of the mandible and an IOPA of the region were taken. The radiographs depicted a mixed, multilocular radiolucent-radiopaque area extending from the region of 43 to 47, measuring approximately 5x6 cm in size. The radiopaque mass had well defined irregular margins fused with the roots of 46 which was vital. The radiolucency surrounding the radiopaque mass had margins that merged with the surrounding bone (Fig. 2), (Fig. 3), (Fig. 4).

**Figure 2**
Fig.2: OPG-Showing multilocular radiolucent-radiopaque areas, extending from 43-47 regions.

**Figure 3**
Fig.3: Occlusal View revealed slight expansion of the lingual cortical plate.
All routine blood examination was conducted before the surgical procedure. An incisional biopsy was performed under LA followed by the primary closure of the wound with 3-0 silk suture. A differential diagnosis of fibrous Dysplasia, Cemento-ossifying Fibroma and Cemento-osseous Dysplasia was made. The excised tissue submitted to the Department of Oral Pathology for histopathological examination.

Gross examination of the tissue specimen received from the areas of superficial bone revealed multiple bits of hard & soft tissue & one larger bit of the deep bone, brownish-white in colour, measuring 2 x 1.4 cm in size and with an elevated nodule on the surface was also received.

The histopathology of the submitted H&E stained sections showed loosely arranged cellular connective tissue stroma with plenty of spindle and stellate shaped cells. Osteoid and cementum like calcified tissue was seen scattered in the stroma. The osteoid tissue showed mineralization to a greater extent. Ovoid cemental masses with basophilic rimming were also evident (Fig. 5), (Fig. 6), (Fig. 7)
Incidental Finding Of Jaw Lesions- A Case Report And Its Review Of Literature

Figure 6
Fig. 6: High power photomicrograph showing osteoid and cementum like calcified tissue within cellular fibrous connective tissue.

Figure 7
Fig. 7: High power photomicrograph showing cementum like calcified tissue within cellular fibrous connective tissue.

The nature of dense mineralized tissue was further substantiated with polarized studies (Fig 8) which showed lamellar pattern of bone and brush-border for cementum like tissue.
DISCUSSION

Fibro-osseous jaw lesions are a clinically diverse, but histologically similar group of conditions. These lesions of the jaws are of particular interest to oral and maxillofacial surgeons, radiologists and pathologists, as they emphasize the crucial role of these specialists in the diagnostic process.1,7

In the current case of a middle aged male patient, the lesion extended from 43 to 47. Our case report recapitulates previous findings but does not concur with the general consensus that COD has a predilection for middle-aged women. Neville & Albenesius reported that the overall prevalence was 5.5% among black women over 21 years of age.8 MacDonald-Jankowski reported that 59% cases were found in Blacks, 37% in Asians and 3% in Caucasians.9 Moreover, the occurrence of the lesion in our case is in the mandible which is in accordance with the accepted idea that COD has a predilection for the mandibular molar area.10 Our case is seen in a dentulous area with co- incidental finding of a previous history of trauma in that region.

The second edition of WHO classification in 1992 recognizes three separate COD entities, “periapical cemental dysplasia” (PCD), “florid COD” (FICOD) and “other COD”.11 Waldron referred to PCD as “periapical COD” (PCOD). According to Waldron, “they appear to represent only variants of the same disease process”.12,13 PCD and FICOD display multiple lesions. The “other COD” category includes all those CODs “which share some features of PCD or FICOD, but do not have their characteristic clinicopathological patterns of presentation”, such as the focal COD (FocCOD), which is a solitary lesion.2

The term “Cemento-Osseous Dysplasia” is a histopathological term rather than a clinical or radiological term, yet diagnosis of FCOD is decided by clinical and radiographic investigation, its histopathology being similar to the two other fibro-osseous lesions (FOLs), cemento-ossifying fibroma and fibrous dysplasia. All three FOLs are characterised by replacement of bone by a benign connective tissue matrix, the matrix displaying varying degrees of mineralization in the form of woven bone or cementum like round basophilic acellular intensely basophilic structures.9

Waldron and co-authors reported that true chronic sclerosing osteomyelitis could appear similar to COD radiographically.14 Waldron’s observation that FCOD is localized in particular to edentulous areas of the posterior mandible is in part supported by Ohkura’s report of two-thirds of the edentulous FCODs occurring in the posterior mandible. Thus, since so many FCODs occur at extraction sites, they may partly represent, as suggested by Waldron, the end-stage of an abnormal reaction of bone to injury. In order to determine how frequently this may occur, comparison should be made between the radiograph at initial detection of the lesion and that at the earlier extraction.15,16

When the lower incisors (which are classically vital) are only involved it is commonly called PCD whereas when two or more quadrants are affected then it is frequently diagnosed as FICOD. Classically the individual lesions of FICOD appears as lobulate masses, which may “attain a considerable size and cause expansion of the jaw”, whereas those of PCD “rarely exceed 1 cm in diameter”. Except for its signature location in the periapical region of lower teeth, the radiographic features of periapical cemento-osseous dysplasia are virtually identical to those of focal cemento-osseous dysplasia. Both entities are characterized by a relatively distinct demarcation from surrounding normal bone and manifest as one or more closely apposed or confluent, round or ovoid, radiolucent lesions with varying amounts of opacity. On radiographic follow up, the lesions begin as cystic areas of radiolucency and tend to become progressively more radiopaque internally but usually do not
exhibit extension into adjacent bone or cause cortical expansion.\textsuperscript{17}

Furthermore, the mean age of the five male patients out of Kawai and co-authors 54 CODs was 64.4 years compared with the females 49.4 years. This could suggest that female sex-linked factors do not only play a role in the high prevalence of this disorder among women, but also in the development of these lesions at a younger age than in males. Although the mean age in women is broadly coincident with the onset of menopause, the absence of a gynaecological history in all reports means that this association should be considered to be circumstantial.\textsuperscript{18}

Unlike PCOD and FICOD, the radiological features of FCOD are not sufficiently specific to differentiate them from small COFs. Therefore “an absolute key…is the gross appearance at surgery”. When curetted FCOD produces, with difficulty, only a few scraps of tissue, whereas COFs are more readily shelled-out, because they “are sharply demarcated, encapsulated with an edge clearly separate from surrounding bone”.\textsuperscript{17}

A point of controversy is the presence or absence of jaw expansion caused by the COD lesion. Few published pathology-based reviews describe COD lesions as being non- expansile. In other reports where occlusal radiographs were examined, a slight expansion of at least one of the mandibular cortical plates was reported with intact, thinned cortices. In this study, occlusal radiographs revealed slight bony expansion.\textsuperscript{19}

Radiographically, most COD cases are reported to be in the mixed radiolucent/radiopaque stage, and the internal radiopacities were described as being either one or a mixture of cementum-like, ground glass, or “Pagetoid” (a term used mostly in the description of extensive radiopacities in florid COD cases).\textsuperscript{20}

Histopathologically, the lesions are usually found to consist of a bland fibrous matrix with globules, trabeculae or large masses of mineralized tissue which are argued to be bone, cementum or both. Waldron et al are of the opinion that bone and cementum could be differentiated on the basis of their polarized light microscopy features, they agreed to consider the sclerotic masses as representative of bone, cementum, or a combination of both, which depends on the way the responsible mesenchymal progenitor cells differentiate.\textsuperscript{21}

Another entity, cemento-ossifying fibroma (COF), can easily be confused on clinical and radiographic grounds with focal cemento-osseous dysplasia. Beginning with a radiolucent stage, these cemento-osseous lesions normally form osteoid and cementoid tissues and their appearances change over time. The radiolucent stage is replaced by a mixed opaque-lucent stage, which may yield to a completely opaque appearance. Radiographically COF are very discrete, having definite sclerotic borders which do not merge with the surrounding bone.\textsuperscript{20} While in this case they do.

An important association of the COD is the traumatic (simple) bone cyst (TBC). Classically the TBC displays little or no buccolingual expansion, but those associated with COD frequently exhibit bucco-lingual expansion and displace the inferior dental canal downwards.\textsuperscript{20}

In addition, there may be an association between the idiopathic osteosclerosis and fluoridation of the water supply. A higher incidence of dental fluorosis was observed in the Chinese than in Caucasians or those of European or Indian descent. A similar high incidence of dental fluorosis was observed in the Japanese. The staple diet of both Chinese and Japanese is generally high in fluoride. Whether fluoride contributes to CODs in these East Asian communities is not known. Therefore, analysis of any CODs or IOSs removed for histopathology should include titration for fluoride.\textsuperscript{20}

Additionally, association of cemento-osseous dysplasia with simple bone cysts and possible complication with secondary infection or osteomyelitis adds to the diagnostic dilemma of cemento-osseous dysplasia of the jaw. Unless symptomatic, no treatment is normally rendered because the process is self-limiting. Management of these conditions involves clinical and radiological follow-up, and periodontal, as well as restorative, care. A follow-up period of months has been recommended. Endodontic therapy should not be performed until periapical COD has been ruled-out.\textsuperscript{1}

Given the limited role of histology in definitive diagnosis of different fibro-osseous lesions, the diagnosis of COD is usually based on the radiographic appearance and in the absence of clinical signs or symptoms. A biopsy is not normally indicated.\textsuperscript{22} Based on the current understanding of cemento-osseous dysplasias, new cases are diagnosed solely on radiographic features.\textsuperscript{20}

Once the diagnosis has been made, no treatment is indicated; surgery and tooth extraction are used only when more conservative treatment has failed. This strategy minimizes the frequency of postoperative complications and poor
tolerance of mucosal-borne dentures. 17

In our case, incisional biopsy was performed for the confirmation and the patient is on review.

CONCLUSION

An alert dentist would play a significant role in paving the way for early diagnosis of many such incidentally found tumors. Diligent care needs to be employed in assessing any changes seen in the jaws of the unsuspected individuals. Focal cementosseous dysplasia is typically asymptomatic and is accidentally detected on radiographic examination. Surgical intervention is not indicated unless the lesion shows signs of enlargement. So periodic follow up is recommended to assess whether the lesion has regressed or progressed.

References

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