



Case Report

# Analogous feature of cemento-ossifying fibroma and bone pathology: A clinico-pathological correlation

Toniya Raut<sup>1</sup>, Shashi Keshwar<sup>2</sup>, Anju Pradhan<sup>2</sup>, Ashish Shrestha<sup>1</sup>

<sup>1</sup>Department of Oral Pathology, BP Koirala Institute of Health Sciences, Nepal

<sup>2</sup>Department of Pathology, BP Koirala Institute of Health Sciences, Nepal

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## ABSTRACT

Intra-osseous pathology of the craniofacial region is microscopically characterized by hypercellular fibroblastic stroma with a variable amount of bone or cementum like calcified structures. The overlapping histopathological features are not limited to lesions under one classification of similar origin rather it imbricates the lesions of entirely different origin as well. The only possible way out then becomes the clinicopathological correlation. Hence, in an out of entire clinical, radiographic, surgical, and histopathological feature reframes the building block for confirmatory diagnosis of bone lesion.

## Correspondence:

Dr. Ashish Shrestha

Additional professor and Head

Department of Oral Pathology

College of Dental Surgery

B.P. Koirala Institute of Health Sciences, Dharan, Nepal

ORCID ID: 0000-0002-1317-0522

Email: ashish.shrestha@bpkihs.edu



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## INTRODUCTION

Bone pathology shares common clinical, radiographic, and histopathological features.<sup>1-3</sup> Fibro-osseous lesions and benign mesenchymal odontogenic tumors are two groups of lesions with overlapping features within and in between the two group.<sup>1,4,5</sup> Symptoms of jaw swelling wherein, pain is vague, radiographic features like cotton wool, ground glass appearance are pathognomonic but cannot be generalized.<sup>2</sup> Microscopic features of the hypercellular area and calcified tissue of bony or cementum are neither conclusive.<sup>1,4,6</sup> However, management varies from surgery as an immediate action to surgery as a contraindication.<sup>1</sup> Here we discuss a case report of a bony lesion where clinicopathological correlation guided to approach the diagnosis.

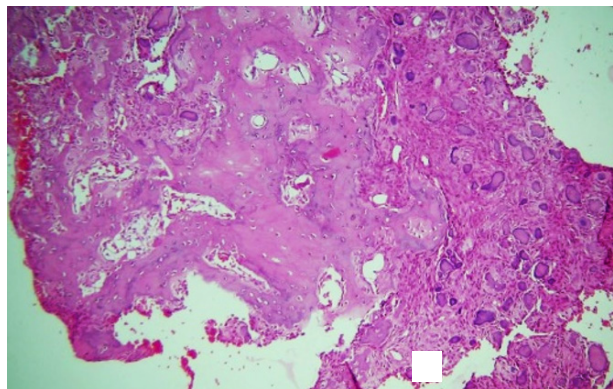
## CASE REPORT

A 21-year male presented with a single, oval, hard swelling in the lower front region of the jaw for three weeks. The lesion extended in the lingual aspect of mandible from 32 to 34 region, measures 8X4 mm<sup>2</sup> in maximum dimension with erythematous periphery and tender on palpation without any relevant medical and personal history. A similar episode was noted one year back which remain unnoticed after a course of antibiotics for a week. The increasing size of the lesion for three weeks was the concern for the revisit. Associated teeth were vital and the suggested intraoral periapical radiograph showed normal bony trabeculae. On surgical exploration, few beads of hard dark brown tissue, altogether measuring 4X5 mm<sup>2</sup> in maximum dimension was obtained which were fixed in 10% neutral buffered formalin followed by decalcification in 10% nitric acid solution and processing. Bony exostosis was considered a clinical diagnosis. The processed tissue was embedded, sectioned into 3 µm thick section, and stained with hematoxylin and eosin. The section revealed numerous trabeculae of bone along with basophilic, acellular spherules resembling cementum in the background of hypercellular fibrous tissue stroma. Bony trabeculae were predominantly woven in nature with distinct osteoblastic rimming and acellular spherules of cementum exhibiting brush border blending into the stroma (fig.1 and 2). The summarized clinicopathological evaluation concluded the lesion to be cemento-ossifying fibroma.

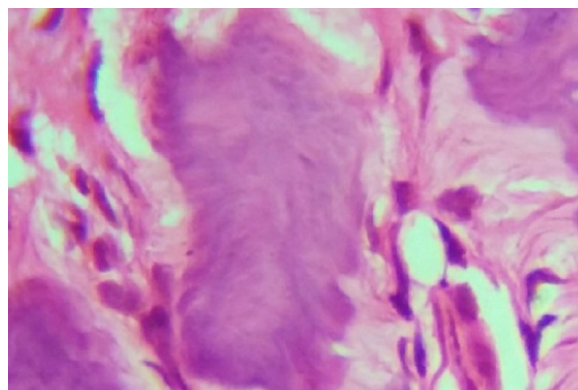
## DISCUSSION

Histopathology holds an integral part in the diagnosis of bony pathologies yet the final diagnosis is often confirmed by combined evaluation of clinical, radiographic, surgical along with microscopic findings.<sup>3,7,8</sup> The clinical symptoms of the present case suspicious of bony exostosis lacks histopathological features of dense, mature, laminated bone pattern which ruled out exostosis to be the diagnosis.<sup>6</sup> The histopathological feature of bony trabeculae along with basophilic cementum like spherules in the background of cellular fibrous connective tissue pointed consideration for fibrous dysplasia, odontogenic fibroma, cemento-osseous dysplasia, cementoblastoma, and ossifying fibroma before landing to the confirmatory diagnosis.<sup>1,4</sup>

Diagnosis of fibrous dysplasia requires histopathologically proven fibro-osseous lesion with ill-defined radiographic margin.<sup>7</sup> The condition is commonly seen among females and the maxillary posterior region. Radiographic feature of ground glass appearance with surgical evidence of lesional bone blending into the normal bone is the diagnostic clue that was absent in the present case. Ribeiro et al in their clinicopathological study for fibrous dysplasia and ossifying fibroma have concluded that peritrabecular clefting is seen in the majority of cases (86.5%) of fibrous dysplasia can be considered as a hallmark for the lesion.<sup>9</sup> This was another feature absent in the present case. Bony trabeculae not



**Figure 1:** Bony trabeculae and spherules of calcification resembling cementum in the background of dense spindle-shaped fibroblast rich connective tissue (HE stain, X100)



**Figure 2:** Brush border of cementum like globular deposits (HE stain; X1000)

connected, lack of osteoblastic rimming was the features whose absence supported to rule out fibrous dysplasia from the list of histopathological differentials diagnosis in the present case.<sup>1</sup>

Odontogenic fibroma often shows foci of calcified structure that resembles cementum or dentin. However, the histopathological features engrave other features as thin strands and islands of the odontogenic epithelium with interlacing collagen bundles. Even in epithelium deprived variant of odontogenic fibroma, there is delicate collagen simulating dental sac-like stromal tissue.<sup>4</sup> These features were considered to rule out odontogenic fibroma in our case. Cementoblastoma has extensive cementum deposition which at times resembles bone-like materials. However, pathognomonic radiographic findings of well-circumscribed radio-opaque mass fused with the root of the tooth (predominately mandibular first molar) surrounded by a radiolucent halo are characteristic. In addition, cementum like trabeculae with basophilic reversal line can also be considered.<sup>4,8</sup>

Cemento-osseous dysplasia (COD) is often diagnosed as periapical radiolucency in relation to the mandibular anterior tooth with intact vitality. The surgical approach is contraindicated in COD to avoid local infection and complicating clinical course.<sup>1</sup> Histopathologically, COD

simulates to cemento-ossifying fibroma (COF). However, features like trabeculae without osteoblastic rimming, irregular spherules like cementum with retraction from the adjacent stroma, and sinusoidal vascularity support COD. In contrast, cemento-ossifying fibroma shows trabeculae with osteoblastic rimming, ovoid spherules with brush border, intimate association with adjacent stroma, and hemorrhagic areas mainly along the margin of the lesion.<sup>3,6</sup> The histopathological features of the present case are closely correlated with the feature of cemento-ossifying fibroma. Hence, the diagnosis was concluded to be cemento-ossifying fibroma.

According to WHO classification of head and neck tumor and bone pathologies, the nomenclature of COF has continuously been updated since 1971 till 2017. In 2005 classification, it was included under ossifying fibroma along with juvenile ossifying fibroma. Juvenile ossifying fibroma was further categorized as trabeculae and psammomatoid type. Latest in 2017, the consensus agreed to separate COF from ossifying fibroma and re-group into benign mesenchymal odontogenic tumor<sup>5</sup> to emphasize the lesion to be odontogenic in origin i.e. mesenchymal blast cell of periodontal ligament which has the potential of dual differentiation into cementum and bone.<sup>10</sup> Trabecular juvenile ossifying fibroma is aggressive and mainly seen in age below 15 years whereas COF is slow growing with a wide range of age distribution. Trabecular type has infiltrating border while COF has a clear border between lesional and healthy tissue. Jaw associated psammomatoid juvenile ossifying fibroma is rare, more than 75% of cases of psammomatoid juvenile ossifying fibroma are extra-gnathic.<sup>1</sup> These features differentiate ossifying fibroma from COF despite being included under the same category years ago.

## CONCLUSIONS

Bone pathology has overlapping features. Individual consideration of clinical, radiographic, surgical, and histopathological features remains vague and inconclusive. Hence, clinicopathological correlation of any bone lesion is of utmost importance to reframe the building block in confirming the diagnosis of various bone lesion to prevent overtreatment and sometimes under treatment along with its possible malignant transforming.

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