PERIPHERAL GINGIVAL MASSES IN PAEDIATRIC PATIENTS: ODONTOGENIC FIBRO-MYXOMA & GIANT CELL GRANULOMA – A REPORT of 2 cases

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ABSTRACT:
Soft tissue enlargements of the oral cavity present a diagnostic challenge because a diverse group of pathologic processes can produce such lesions. World Health Organization classification of benign odontogenic tumors grouped OFM as benign tumors of ectomesenchymal origin with or without odontogenic epithelium. The lesion often grows without symptoms and presents as a painless swelling. It commonly occurs in the second and third decade showing mandible commonly involved than maxilla. The peripheral giant cell granuloma (PGCG) is a benign inflammatory hyperplastic type of lesion of unknown etiology occurring in gingiva or alveolar ridge. It normally presents as a soft tissue purplish-red nodule consisting of multinucleated giant cells in a background of mononuclear stromal cells and extravasated red blood cells. This article reports two cases one of odontogenic fibromyxoma and another of Peripheral Giant Cell Granuloma in pediatric patients. Both the lesion were excised and sent for histopathologic examination which confirmed the diagnosis. The accepted treatment protocol includes surgical excision followed by histopathologic evaluation and follow-up. Early and definite diagnosis correlating clinical, radiologic and histopathologic examination is important for conservative management of such lesion thus eliminating potential risk to adjacent hard tissue structures.

KEYWORDS: Oral Exophytic Lesions, Peripheral Fibromyxoma, Giant cell granuloma lesions.

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INTRODUCTION

The gingiva is exposed to irritation from biofilm, food impaction, calculus, irregular restorations, and iatrogenic factors, which can result in localized proliferative lesions.\(^1\)

Solitary gingival enlargements in children are a relatively common finding and are usually the result of a reactive response to local irritation.\(^2\)

Odontogenic myxoma is classified as a rare benign tumor of ectomesenchymal origin with or without odontogenic epithelium.\(^3\) The term “myxoma/ myxofibroma” is introduced by Virchow in 1871, when he described tumors that histologically resembled the mucinous tissue of the umbilical cord. Odontogenic fibromyxoma is a myxoma with abundant collagen fibers.\(^10\)

Peripheral giant cell granuloma is a common tumor-like gingival lesion that results from reactive response of the periodontal ligament.\(^4\) Clinically, presents as a rubbery, smooth surfaced nodule or mass that is red, purple or blue in color.\(^5\)

We report a case of peripheral odontogenic fibromyxoma of the mandibular anterior lingual gingiva in a 9-years-male and peripheral giant cell granuloma in 12-years-female on buccal gingiva.

CASE 1

A 9-years old male patient reported with a chief complaint of intraoral painless swelling in lower anterior lingual gingiva since 3 years and difficulty in incising food since 6-months. Initially it was of peanut size and gradually attained the present size.

There was no history of anesthesia or paresthesia. Intraoral examination revealed a solitary well defined round swelling measuring 2.5cm x 3cm in its greatest dimensions, more bulge on lingual side involving inter-dental papillae was present in mandibular anterior region with missing 41 & spacing in 31, and 42 (Fig 1).

On palpation it was sessile, non-tender and firm in consistency. A solitary left Submandibular lymph node was palpable roughly oval, soft, mobile and tender. Based on the history and clinical features a provisional clinical diagnosis of Peripheral ossifying fibroma and Peripheral giant cell granuloma, pyogenic granuloma and traumatic fibroma were included in differential diagnosis.

Panoramic radiograph & IOPA revealed periodontal ligament widening with 31 and 42. Cupping alveolar crestal bone resorption was present with 42 and 31(Fig 2-a and 2-b).

Radiographic differential diagnosis of Peripheral ossifying fibroma and Peripheral giant cell granuloma was given. Under all septic conditions, surgical excision was done under local anesthesia (Fig 3).

After one week healing was uneventful. H & E histopathological section revealed (40X) the fibrocellular connective tissue stroma shows presence of myxoid tissue and fibroblasts features suggestive of Odontogenic fibromyxoma. (Fig 4)
Figure 1. Intraoral swelling in mandibular anterior region

Figure 2a. Panoramic radiograph of the patient

Figure 2b. Periapical radiograph of mandibular anterior region

Figure 3. Surgical excision of the lesion

Figure 4. Fibrocellular connective tissue stroma showing presence of myxoid tissue and fibroblasts

FIBROBLASTIC STROMA

MYXOID STROMA
CASE 2
A 12-years old female patient reported with a chief complaint of intraoral painless growth in premolar-molar region and fullness of right cheek since 2 years (Fig 5).

The swelling was of approximately of a coin sized to begin with and had gradually attained the presented size. There was no history of anesthesia or paresthesia, difficulty in mastication & bleeding or any discharge. Intraoral, solitary round well defined growth measuring 2.5cm x 3cm in its greatest dimensions was present in mandibular premolar-molar region involving depth of sulcus area, marginal and attached gingiva (Fig 5).

On palpation it was sessile, firm in consistency and non-tender. A solitary right Submandibular lymph node was palpable roughly oval, soft, tender, and mobile. Based on the history and clinical features a provisional clinical diagnosis of Peripheral ossifying fibroma and differential diagnosis of Peripheral giant cell granuloma, pyogenic granuloma was given.

Intraoral periapical radiograph revealed periodontal bone loss with 45 (white arrowhead) and periodontal ligament widening with mesial root of 46 (black arrow) (Fig 6).

Radiographic differential diagnosis of Peripheral ossifying fibroma and Peripheral giant cell granuloma was given.

Under all aseptic conditions, surgical excision was carried out under local anesthesia, hemostasis achieved with 3-0 Silk Sutures. (Fig 7) and Excised specimen was sent for histopathological evaluation.

Histopathological H and E section revealed (40 X) multinucleated giant cells. The fibroblasts were spindle to angular shape in the background of mild inflammatory infiltrate. The bony tissues comprises of round to oval osteoblasts with basophilic nuclei situated in the centre. Features were suggestive of Peripheral giant cell granuloma. (Fig 8)

Figure 5. Intraoral swelling in mandibular premolar-molar region

Figure 6 Intraoral periapical radiograph showing periodontal bone loss with 45 (white arrowhead) and periodontal ligament widening with mesial root of 46 (black arrow).
DISCUSSION

The term oral mucosal masses are described as pathologic growths projecting above the normal contour of the oral mucosa & may be progressive which compromises normal oral function.²⁶

Fibromyxoma is classified as a specific type of myxoma with a higher fibrous/myxoid tissue ratio than myxoma.⁷ Myxomas/fibromyxomas arise from the mesenchymal tissue of the dental follicle, thus being described as Odontogenic with fibroblasts playing the major role in cell dispersal.³

It is a slow growing, asymptomatic mostly located in the tooth bearing areas of the jaws usually occurring in the second or third decade of life. The occurrence is common in premolar-molar region of mandible followed by maxilla with slight predilection for females.⁸⁹ Maxillary lesions are more aggressive, as it involves the adjacent vital structures maxillary sinus, nasal cavity and of profuse vascularity.¹⁰,¹¹ Displacement and mobility of teeth are relatively common and associated with unerupted teeth.⁶,¹²,¹³

The radiographic features are variable, depending upon site, size and consistency of the lesion. Usually diagnostic methods include conventional radiography and incisional biopsy with histological and histochemical investigations.¹³

Immuno-histochemical examination uses antibodies against specific biological substances of neuronal, muscular, epithelial, and mesenchymal tissues.¹⁰

In MRI, the lesion shows low-signal intensity in T1 and high-signal intensity in T2. In contrast, Kawai et al; reported high-signal intensity on T1 and not T2.¹⁵ These discrepancies may be related to the ratio of fibrous/myxoid tissue, the viscosity, the concentration of proteins, the presence of hemorrhage and hypocellularity.¹³,¹⁸

Histopathologically, Odontogenic myxoma is made up of loose and delicate fibrous connective tissue. The fibroblasts are stellate
and are suspended in a delicate network of collagen fibrils.\textsuperscript{16,17} The fibromyxoid lesion may present loci of calcification or ossification and a higher amount of collagen fibres and vessels than a typical myxoma.\textsuperscript{18} The presence of cells positive for actin fibres suggests that myofibroblasts may play a crucial role in cell proliferation in cooperation with the islands of Odontogenic epithelium and mast cells.\textsuperscript{19,20}

The avoidance of recurrence is strongly related to the complete resection of the lesion. Monitoring of the patient for at least 2 years after the surgical intervention is recommended due to the higher rate of recurrence during this period.\textsuperscript{18}

The peripheral giant cell granuloma (PGCL), also called as giant cell epulis, or giant cell hyperplasia, is most common giant cell lesion of the oral cavity.\textsuperscript{21}

Peripheral giant cell lesions are reactive, extra-osseous and exophytic lesion, located in anterior edentulous alveolar mucosa or on the gingiva. Local irritating factors such as food retention, chronic irritation due to sharp cusps, trauma, poorly finished fillings, and poorly fitted dental prostheses, and supernumerary teeth, bacterial plaque, calculus are considered as contributing factors.\textsuperscript{22}

Clinically, PGCL mostly appear as a soft extra-osseous reddish purple or purplish blue lump with smooth shiny surface. The lesion can be sessile or pedunculated, penetrating through periodontal membrane and may or may not be ulcerated. Secondary ulceration due to trauma results in focal yellow sloughing caused by the formation of fibrin clot over the ulcer.\textsuperscript{22,23}

Pain is not a major complaint unless the growth is traumatized repeatedly.\textsuperscript{24} Radiographic examination most commonly presented is “cup-shaped” resorption of the subjacent alveolar bone.\textsuperscript{25-27}

In terms of histology, PGCG contains non-encapsulated highly cellular mass with abundant multinucleated giant cells dispersed. Fibroblasts form the basic element of the peripheral giant cell granuloma.\textsuperscript{27,28} Inflammatory infiltrate and hemosiderin-laden macrophages surrounding areas of hemorrhages are seen in both acute & chronic condition.\textsuperscript{29}

Recommended management of PGCG aims at elimination of the entire base of the growth accompanied by eliminating local irritating factors. It is advisable to include the periosteum in the excision to prevent recurrences.\textsuperscript{30}
## Table: 1 Showing clinical features, locations and age in peripheral gingival masses:

<table>
<thead>
<tr>
<th>Lesion</th>
<th>M:F Ratio</th>
<th>Age</th>
<th>Site</th>
<th>Clinical features</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pyogenic granuloma</td>
<td>F&gt;M</td>
<td>All ages but predominant in 2nd decade</td>
<td>Gingiva,(75%) followed by lips, tongue, buccal mucosa</td>
<td>A smooth or lobulated exophytic lesion, pedunculated or sessile which is usually hemorrhagic and compressible bluish red in colour.</td>
</tr>
<tr>
<td>Peripheral giant cell granuloma</td>
<td>F&gt;M</td>
<td>All ages group but common in 3rd to 7th decade</td>
<td>Mandible&gt;Mandible, gingiva, alveolar mucosa</td>
<td>PGCG occurs exclusively on gingiva or edentulous alveolar mucosa, sessile or pedunculated lesion which is usually deep red to bluish red and bleed easily.</td>
</tr>
<tr>
<td>Peripheral ossifying Odontogenic fibroma</td>
<td>F&gt;M</td>
<td>1st and 2nd decade</td>
<td>Incisor-cuspid region</td>
<td>Nodular mass, pedunculated or sessile pink to red in color and surface is usually but not always ulcerated</td>
</tr>
<tr>
<td>Odontogenic Fibromyxoma</td>
<td>F&gt;M</td>
<td>2nd to 3rd decade of life</td>
<td>Maxillary premolar-molar region, and appeared either inflamed, red or coral pink, firm and fibrous</td>
<td>Exophytic masses, usually from the interdental region, and appeared either inflamed, red or coral pink, firm and fibrous</td>
</tr>
<tr>
<td>Irritation fibroma</td>
<td>F&gt;M</td>
<td>At any age but common in 4th to 6th decade</td>
<td>Lip, cheek followed by maxillary and mandibular gingival</td>
<td>Non-tender, sessile, round or ovoid growth with a broad base, that is pale in colour</td>
</tr>
</tbody>
</table>

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**Note:** This table summarizes the clinical features, locations, and age distribution of different types of peripheral gingival masses. Each entry provides critical information on the lesion's characteristics, typical location, and age prevalence, offering insights into the management and treatment approaches for these conditions.
CONCLUSION:
Diagnosis of peripheral oral exophytic lesions might be quite challenging. There are several underlying mechanisms responsible for oral exophytic lesions such as hypertrophy, hyperplasia, neoplasia, & pooling of fluid. Accordingly all the gingival lesions are to be biopsied before total excision irrespective of size to arrive at the diagnosis. Reported recurrence rate is 25% in fibromyxoma and 9.9% in peripheral giant cell granuloma, therefore cases of peripheral Odontogenic myxoma & peripheral giant cell granuloma requires follow up.

CONFLICTS OF INTEREST
The authors declare that there are no conflicts of interest regarding the publication of this paper.

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