



# Peripheral Ossifying Fibroma: A Review

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## Introduction

In the oral cavity, gingiva is a common site for neoplastic and non-neoplastic lesion<sup>1</sup>. Neoplasm can be defined as progressive autonomous growth of the unwanted tissue that can be either a benign or a malignant lesion<sup>2</sup>. There are two types of ossifying fibromas have been found, first one is the central type and second is the peripheral type (Peripheral ossifying fibroma: POF)<sup>3</sup>. Shamim et al. reported that POF was most frequent benign neoplasm (45.4%) seen in the gingival biopsies in the South Indian population<sup>4</sup>. The POF however does not depict the extra-osseous/soft tissue counterpart of the central ossifying fibroma, which is a true neoplasm, as the latter develops from the endosteum and may cause expansion of the medullary cavity<sup>3</sup>. The peripheral ossifying fibroma (POF) is a benign tumor that represented as an exophytic, smooth-surfaced, reddish to pink in color, nodular mass, sessile, or is less frequently seen on a pedicle. POF occurs only on the soft tissues covering the tooth-bearing areas of the jaws. It is usually grow as solitary in nature thought to arise from the periodontal ligament, rarely can be multicentric<sup>5</sup>.

Multicentric variants mostly have been reported in association with conditions such as Gardner's syndrome, neurofibromatosis, nevoid basal cell carcinoma syndrome and multiple endocrine neoplasia type II<sup>6</sup>.

## What's In The Name

Various terms used for POF indicate that there is so much controversy in the nomenclature and classification of such lesions.

- In 1844, Shepherd first reported this entity as "alveolar exostosis".
- In 1972, the term POF was coined by Eversole and Rovin.
- In 1982, POF was named as peripheral odontogenic fibroma by the Gardner and proposed that the term should be restricted to the extra osseous counterpart of central odontogenic fibroma (World Health Organization type), which is a completely different entity.
- In 1984, Bhasker et al. described this lesion as peripheral fibroma with calcification<sup>7,8</sup>.

Different terms have been used to describe this lesion like peripheral ossifying fibroma, peripheral cementifying fibroma, peripheral cemento-ossifying fibroma, peripheral

fibroma with calcification, peripheral fibroma with cement genesis, ossifying fibro-epithelial polyp, peripheral fibroma with osteogenesis, calcifying, calcifying fibroblastic granuloma or ossifying fibrous epulis which has been adding to confusion<sup>9</sup>.

The term most commonly used is peripheral ossifying fibroma & odontogenic fibroma. The latter term has been used for a lesion described by WHO in their classification of odontogenic tumor as totally different entity<sup>9</sup>. It is almost impossible to differentiate between ossifying and cementifying fibroma clinically and radiographically<sup>6</sup>. The designation, ossifying fibroma is now regarded as more appropriate & widely accepted. (MacDonald & Jankowski 2004<sup>10</sup>, Speight & Carlos 2006<sup>11</sup> and Yadav & Gulati 2009<sup>12</sup>). The term peripheral ossifying fibroma, which is described here, is relatively common gingival lesion characterized by a highly cellular, usually exhibiting bone formation, although occasionally cementum like material or dystrophic calcification may be found in this lesion.

## Clinical Features

POF may occur at any age but shows a peak incidence between the second and third



decades<sup>13</sup>. By Cundiff et al. 50% of the lesion occurred between the ages of 5-25 years with peak incidence at 13 years<sup>14</sup>. Lesions are approximately equally found between mandible and maxilla and mostly occur anterior to the molars. The lesion affects females more commonly in comparison to males (5:1 respectively). Clinically, it is well demarcated focal mass of tissue on the gingiva, sessile or less frequently pedunculated. It is of the same colour similar to that of surrounding gingiva or slightly reddened. The surface may be ulcerated or intact and erythematous. It does not blanch on palpation. The lesions of POF are usually less than 1.5-2 cm in diameter, but have been reported to larger sizes also. POF can cause resorption of the alveolar crest and displacement of adjacent teeth with pathologic migration<sup>6</sup>.



Figure 1: Clinical presentation of peripheral ossifying fibroma

**Radiographic Features**

Radiographically the features of POF tend to vary. It may range from no change to destructive changes depending on the duration of the lesion<sup>15,16</sup>. In majority of cases, no apparent underlying bone involvement. Underlying bone involvement is generally not visible on a radiograph but in very few instances erosion of superficial bone can be seen. Foci of calcifications have been reported to be scattered in the central area of the lesion, but not in all lesions<sup>12,15,16</sup>.



Figure 1: Radiographic presentation of peripheral ossifying fibroma

**Etiopathogenesis**

The most widely accepted etiopathogenesis for POF is the inflammatory hyperplasia of the cells of the periodontal ligament or periosteum. There is excessive proliferation of mature fibrous connective tissue in response to gingival irritation, gingival injury, sub gingival calculus or a foreign bodies in the gingival sulcus<sup>12</sup>.

Chronic irritation of the periodontal membrane and periosteum causes metaplasia

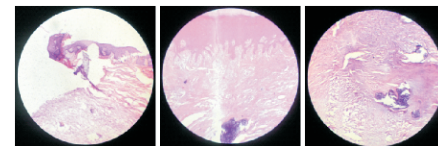
of the connective tissue stroma and result in initiation of formation of bone or dystrophic calcification. Origin of POFs suggested from the cells of periodontal ligament because of

1. Chiefly occurrence of POF to interdental papilla, which is close proximity of gingiva to periodontal ligament.
2. Presence of oxytalan fibres within the mineralized matrix of some lesions
3. Age distribution, which is inversely related to the number of lost permanent teeth
4. Fibro-cellular response similarly to other reactive gingival lesions of periodontal ligament origin<sup>7</sup>.

Marcos A. Jose et al., 2010 proposed that the proliferating cells of connective tissue are of myo-fibroblastic nature ((i.e., cells exhibit morphological characteristics with fibroblasts and muscle cells)<sup>17</sup>. Immunohistochemical study revealed that nature of these proliferating spindle shaped cells showed the cells positive to vimentin and actin suggesting the myo-fibroblastic nature<sup>18</sup>.

**Histologic Features**

Surface of POF exhibit either an intact or more frequently ulcerated layers of stratified squamous epithelium. The bulk of the lesion is composed of highly cellular mass of connective tissue composed of large numbers of plump proliferating fibroblasts, intermingled in a very delicate fibrillar stroma. POF can mimic pyogenic granuloma because sometimes endothelial proliferation is dense in areas of ulceration. Vascularity is not nearly prominent as in pyogenic granuloma. Different forms of calcification seen in this lesion and vary in amount in case to case. Calcification is present in the form of single or multiple interconnecting trabeculae of bone or osteoid but less commonly seen as globules of



calcified material closely related to cementum or diffuse dystrophic calcification<sup>9</sup>. Gardner in 1982 stated that cellular connective tissue of POF is so peculiar in nature that histological diagnosis can be made with confidence, regardless of the presence or absence of calcification. Presence of collagenous connective tissue, proliferation of endothelial cells and formation of a mineralized product characterize the peripheral variant<sup>19</sup>.

**Differential Diagnosis**

Clinical differential diagnosis is peripheral odontogenic fibroma, peripheral giant cell granuloma, pyogenic granuloma and fibroma<sup>20</sup>. Histologically, POF should be differentiated from peripheral odontogenic fibroma. Peripheral odontogenic fibroma is a real tumorous, unlike the POF and has odontogenic epithelium and dysplastic dentine. POF in some cases may initially

develop as a pyogenic granuloma that undergoes subsequent fibrous maturation and calcification<sup>21</sup>.

Histopathologically peripheral giant cell granuloma and fibroma shows focal collections of multinucleated giant cells lying in a rich vascular bed and cellular connective tissue stroma and stretched atrophic stratified squamous epithelium with rich dense fibrous tissue respectively. In inflammatory fibrous hyperplasia, the inflammatory component will be predominant. If POF is suspected, a histopathologic diagnostic approach should always be considered. The histopathologic diagnosis of POF depends upon several factors including benign fibrous connective tissue with varying amount of fibroblasts, myofibroblasts and collagen fibres, sparse to profuse endothelial proliferation and calcified material, which may be in the form of mature, lamellar or woven osteoid or cementum like material or dystrophic calcifications<sup>18</sup>.

DIFFERENTIAL DIAGNOSIS				
Case	Lesion	Clinical Features	Histopathologic Features	Other Features
1	Pyogenic granuloma	Red, lobulated, friable, pedunculated mass. Painful. Usually an elevated polypoidal or sessile, compressible, capillary mass. Usually on gingiva.	Epithelium from residual granulation tissue. Infiltrate of blood cells & chronic inflammatory cells. Vascular proliferation.	Can be seen in gingiva, alveolar ridge and gingival sulcus.
2	Peripheral giant cell granuloma	Red, lobulated, friable, pedunculated mass. Painful. Usually an elevated polypoidal or sessile, compressible, capillary mass. Usually on gingiva.	Epithelium from residual granulation tissue. Infiltrate of blood cells & chronic inflammatory cells. Vascular proliferation.	Can be seen in gingiva, alveolar ridge and gingival sulcus.
3	Peripheral ossifying fibroma	Red, lobulated, friable, pedunculated mass. Painful. Usually an elevated polypoidal or sessile, compressible, capillary mass. Usually on gingiva.	Epithelium from residual granulation tissue. Infiltrate of blood cells & chronic inflammatory cells. Vascular proliferation.	Can be seen in gingiva, alveolar ridge and gingival sulcus.
4	Periapical abscess	Red, lobulated, friable, pedunculated mass. Painful. Usually an elevated polypoidal or sessile, compressible, capillary mass. Usually on gingiva.	Epithelium from residual granulation tissue. Infiltrate of blood cells & chronic inflammatory cells. Vascular proliferation.	Can be seen in gingiva, alveolar ridge and gingival sulcus.
5	Peripheral odontogenic fibroma	Red, lobulated, friable, pedunculated mass. Painful. Usually an elevated polypoidal or sessile, compressible, capillary mass. Usually on gingiva.	Epithelium from residual granulation tissue. Infiltrate of blood cells & chronic inflammatory cells. Vascular proliferation.	Can be seen in gingiva, alveolar ridge and gingival sulcus.
6	Malignant tumor	Red, lobulated, friable, pedunculated mass. Painful. Usually an elevated polypoidal or sessile, compressible, capillary mass. Usually on gingiva.	Epithelium from residual granulation tissue. Infiltrate of blood cells & chronic inflammatory cells. Vascular proliferation.	Can be seen in gingiva, alveolar ridge and gingival sulcus.

**Treatment**

Treatment of POF consists of termination of persistent etiological factors, irritants, scaling of adjacent teeth and total surgical excision along with the involved periodontal ligament and periosteum to minimize the chances of recurrence. Long-term postoperative follow-up is much important because of the high growth potential of incompletely removed pathology and a relatively high recurrence rate<sup>22</sup>.

**Recurrence**

Recurrence rates have been reported from 7% to 45% (Buchner & Hansen 1987<sup>23</sup>, Kenny et al 1989<sup>24</sup>, Eversole & Rovin, 1972<sup>7</sup>).

**Conclusion**

POF is a progressing tumor with high recurrence rate. The most accepted theory of its origin is from the periodontal ligament but still further studies are needed regarding its origin by the application of various newer techniques like immunohistochemistry. High rate of occurrence of this lesion among females may show some hormonal role in its etiopathogenesis but yet need to be proved. It is important for the clinicians to differentiate it clinically, histologically and radiographically from various other gingival lesions, so that proper management can be done as soon as possible. Proper surgical treatment should be done along with removal of all the etiological factors and irritants so as to prevent the recurrence.

**References**

References are available on request at editor@healtalkht.com

