

## ORIGINAL ARTICLE

# Reactive hyperplastic lesions of the oral cavity: A survey of 295 cases at a Tertiary Health Institution in Kerala

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## ABSTRACT

**Background:** The aim of this study was to review the clinicopathologic features of reactive hyperplastic lesions (RHLs) of the oral cavity at a Tertiary Health Institution in Kerala and compare these data with those of previously reported studies. **Materials and Methods:** The patient case files from the Department of Oral and Maxillofacial Pathology during the period between January 2007 and December 2011 were reviewed for cases of RHLs of the oral cavity. Both clinical and histopathological diagnoses of reactive lesions were selected for the study. Data including the type of the lesion, age, gender and the site involved were collected. **Results:** From a total of 2753 cases reviewed, 295 histologically diagnosed cases of RHLs were obtained with a prevalence of 10.7%. The data consist of 85 (28.8%) males and 210 (71.2%) females. The most common lesion clinically was traumatic fibroma (69.3%) and histologically fibrous hyperplasia (51.9%). The reactive lesions clinically presented as either sessile (54.9%) or pedunculated (45.1%) lesions. **Conclusion:** The clinical features of reactive hyperplasia among our patients were similar to those reported previously with divergence in some analyzed data. The novelty in our study was the correlation between histopathology and clinical features which were not reported in literature until date.

**Key words:** Peripheral giant cell granuloma, peripheral ossifying fibroma, pyogenic granuloma, reactive hyperplastic lesions, traumatic fibroma

## INTRODUCTION

Reactive hyperplastic lesions (RHLs) are clinically and histologically nonneoplastic nodular swellings that develop in response to chronic and recurrent tissue injury.<sup>[1]</sup> The proliferative activity of the reactive lesions is considered to be initiated by local irritants. However, the level of circulating hormones plays a role in some of these lesions, such as pregnancy tumor (PT) and reactive lesions associated with puberty.<sup>[2,3]</sup> The elimination of local irritants and proper dental replacement may contribute to the reduction of these lesions.

Clinically, the reactive lesions can be classified as traumatic fibroma (TF), pyogenic granuloma (PG), PT and epulis fissuratum (EF).

TF is a localized hyperplastic lesion in response to irritation or trauma which is commonly seen in the buccal mucosa along the bite line.<sup>[4]</sup> PG is an exaggerated localized connective tissue reaction to minor injury or irritation.<sup>[5]</sup> PG which frequently develops in pregnant women during the first trimester through the 7<sup>th</sup> month is termed as PT. The peripheral ossifying fibroma (POF) is considered reactive rather than neoplastic in nature that undergoes fibrous maturation and subsequent calcification. Peripheral giant cell granuloma is a relatively common tumor-like growth, which is categorized as a reactive lesion and is nonneoplastic. EF is a tumor-like hyperplasia of fibrous connective tissue seen in the flange of an

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ill-fitting complete or partial denture. Clinically, RHLs present as sessile or sometimes pedunculated masses, with either an ulcerated or an intact smooth surface.<sup>[3]</sup> The consistency of reactive hyperplasia varies from soft or rubbery to firm.<sup>[3]</sup> Some RHLs such as PG may bleed easily. RHL usually shows no radiographic finding; however, in some cases erosion and cup-shaped radiolucency occurs in the underlying bone which is due to the pressure from these lesions.<sup>[6]</sup>

The histologic classification of RHL has been equivocally described in literature. However, Kfir *et al.* had proposed a histologic classification of RHLs as angiomatous hyperplasia (AH), fibrous hyperplasia (FH), POF and peripheral giant cell granuloma (PGCG).<sup>[7]</sup>

Clinical behavior of RHLs may vary in different population which reflect the different environmental factors, lifestyles and racial factors.<sup>[2,6]</sup> We conducted this study as the results of various studies on reactive lesions have inconclusive results, besides studies on Indian population are scarce.

## MATERIALS AND METHODS

The patient case files from the Department of Oral and Maxillofacial Pathology during the period between January 2007 and December 2011 were reviewed for cases of RHLs of the oral cavity. Both clinical and histopathological diagnoses of reactive lesions were selected. Data including the type of the lesion, age, gender and the site involved were collected. Clinically, the reactive lesions can be classified as TF, PG, PT and EF. Histopathological diagnosis of the above mentioned lesions includes FH [Figure 1], AH [Figure 2], POF [Figure 3] and PGCG [Figure 4]. The sites involved were lip, palate, tongue, buccal mucosa and gingiva. Gingiva was again divided into upper anterior, upper posterior, lower anterior and lower posterior. Clinical appearance consists of sessile or pedunculated masses. Correlation between clinical

and histopathological features was done. All the lesions were treated by excisional biopsy and the cause for chronic irritation was eliminated at the time of excision. Descriptive statistics was applied to the data and differences in frequencies among groups were evaluated using SPSS (IBM Corporation) software.

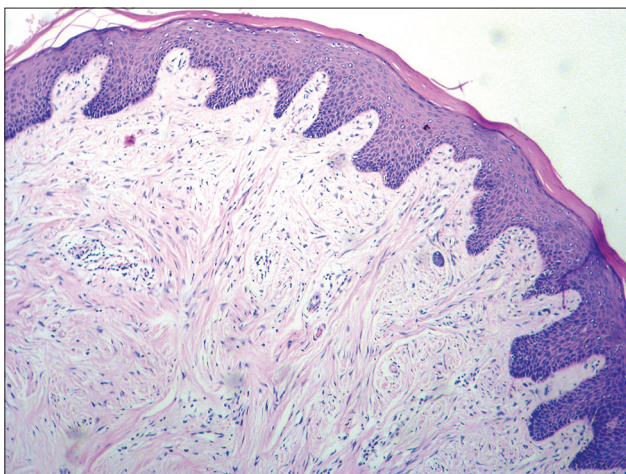
## RESULTS

From a total of 2753 cases reviewed, 295 cases were diagnosed as RHLs, with a prevalence of 10.7%. The data consist of 85 (28.8%) males and 210 (71.2%) females [Table 1]. The predominant site of distribution of lesion was in the gingiva (64.8), followed by the buccal mucosa (18.6) with the other sites accommodating the remaining percentile [Table 2]. The most common lesion clinically was TF (69.3), followed by PG (26.3%), EF (3.4%) and PT (1.4%) [Graph 1]. The histopathological diagnosis of the above mentioned lesions includes fibrous hyperplasia (51.9%), angiomatous hyperplasia (35.3%), POF (9.8%) and PGCG (3%) [Graph 2]. The reactive lesions clinically presented as either sessile (54.9%) or pedunculated (45.1%) [Table 3] lesions. There was a wide fluctuation in the age distribution of the sample selected in our study henceforth this variable was excluded.

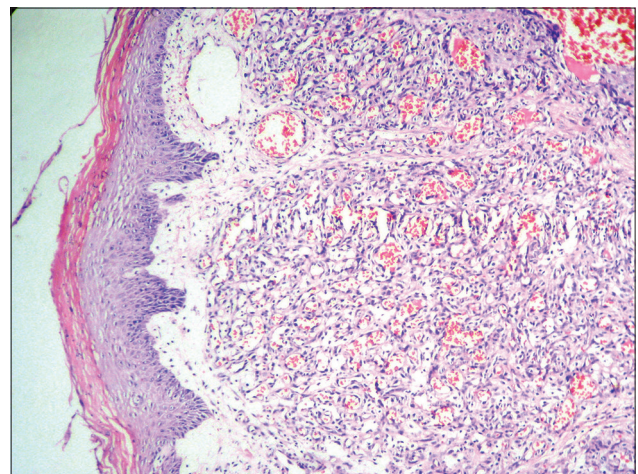
## DISCUSSION

This study is a report of the prevalence of clinical and histopathological characteristics of 295 cases of RHLs over a 5-year period.

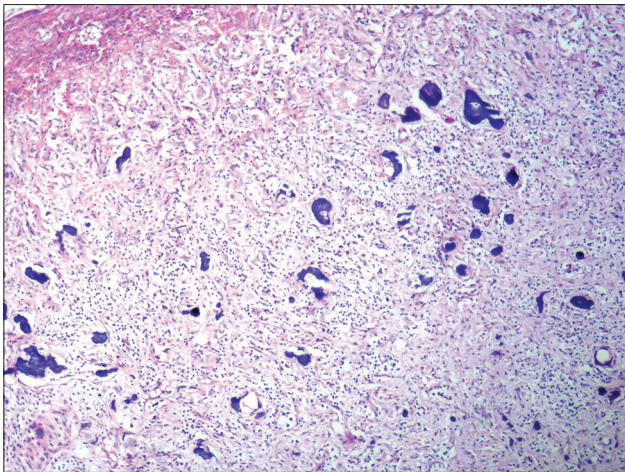
In a study carried out by Zarei *et al.*,<sup>[3]</sup> RHLs were more common in females (male: female ratio was 1:1.4). In addition, in a study carried out by Al-khateeb,<sup>[5]</sup> the most commonly affected site was gingiva. We also got consistent results as the aforementioned studies, with a female predilection (male: female ratio was 1:2.47) and gingiva being more



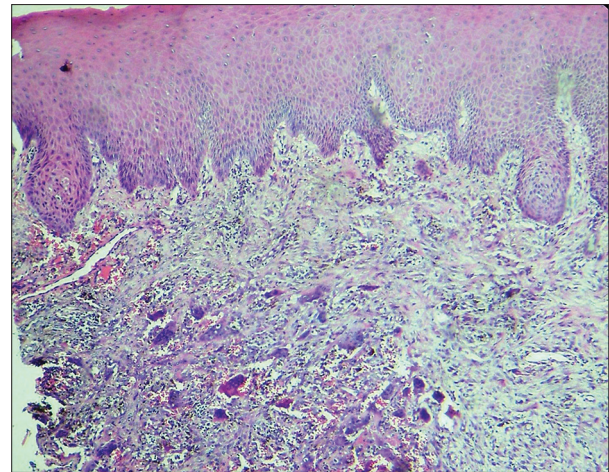
**Figure 1:** Photomicrograph of fibrous hyperplasia demonstrating keratinized epithelium and fibrous connective tissue stroma (H&E stain, x100)



**Figure 2:** Photomicrograph of angiomatous hyperplasia showing proliferating endothelial cells, congested blood vessels with overlying keratinized epithelium (H&E stain, x100)



**Figure 3:** Photomicrograph of peripheral ossifying fibroma showing areas of calcification in the fibrous connective tissue stroma (H&E stain, x100)



**Figure 4:** Photomicrograph of peripheral giant cell granuloma demonstrating giant cells in fibrous connective tissue stroma with overlying epithelium (H&E stain, x100)

**Table 1: Distribution of 295 cases of reactive hyperplastic lesions according to clinical diagnosis versus gender**

Clinical diagnosis	Gender				Percentage
	Males		Females		
	Frequency	Percentage	Frequency	Percentage	
Epulis fissuratum	3	3.5	7	3.3	3.4
Pregnancy tumor	0	0	4	1.9	1
Pyogenic granuloma	20	23.5	61	29	26.3
Traumatic fibroma	62	72.9	138	65.7	69.3
Total	85		210		100

**Table 2: Distribution of 295 cases of reactive hyperplastic lesions according to site**

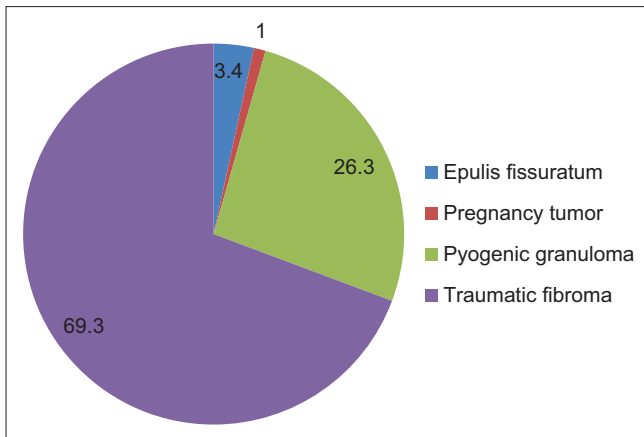
Site	Frequency	Percentage
Buccal mucosa	55	18.6
Floor of the mouth	2	0.6
Gingiva		64.8
Lower anterior	61	20.7
Lower posterior	47	15.9
Upper anterior	63	21.4
Upper posterior	20	6.8
Lower lip	5	1.7
Palate	9	3.1
Tongue	28	9.5
Upper lip	5	1.7
Total	295	100

frequently affected. The gingival lesions were further divided into 4 regions, and we came to the conclusion that the upper and lower and lower anterior regions had the most prevalence. Aghbali *et al.*<sup>[8]</sup> in a study, distributed the reactive lesions according to the prevalence as fibroma being most prevalent followed by giant cell granuloma, PG, POF and EF. Conflicting to the results obtained in the survey conducted by Aghbali *et al.*,<sup>[8]</sup> the results of our study showed that the most common lesion encountered clinically was TF followed by PG and EF.

The frequency distributions of cases histopathologically in the descending order were FH, AH, POF and PGCG. The four reactive lesions clinically presented as either sessile or pedunculated masses. Many studies suggested that sessile base was the typical clinical feature in RHL.<sup>[9]</sup> However, it has been shown in one report that most of PGCGs were pedunculated.<sup>[10]</sup> Interestingly, in our study, sessile bases were predominantly seen in TF; pedunculated were common in PT and PGCG; EF, PG and POF showed equal predilection.

TF accounts for the great majority of localized gingival swellings. Nevelle, *et al.* reported that TF can occur anywhere in the mouth, the most common location is the buccal mucosa along the bite line.<sup>[4]</sup> In the present study, it was found that gingiva is the most common site for fibroma with equal incidence in lower and upper jaws, this is in accordance with the study by Pour *et al.*<sup>[6]</sup>

PG bleeds easily due to extreme vascularity. Microscopic examination of PG generally shows an ulcerated surface epithelium that overlies a connective tissue which contains numerous small and large endothelium-lined channels that are engorged with blood cells, simulating AH. In agreement with previous studies,<sup>[6,8]</sup> gingiva was the most prevalent site and females were more affected. The gradual rise in the



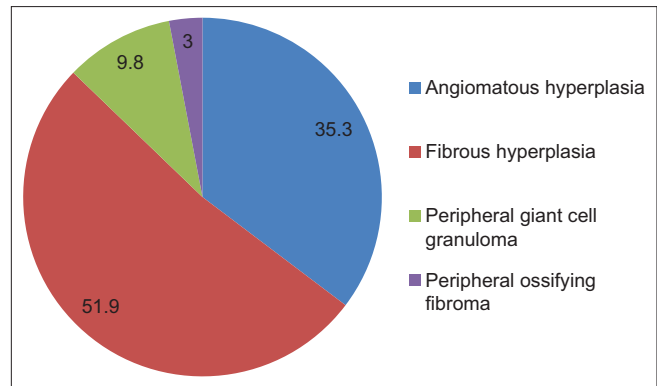
**Graph 1:** Distribution of 295 cases of reactive hyperplastic lesions according to clinical diagnosis (%)

**Table 3: Distribution of 295 cases of reactive hyperplastic lesions according to clinical presentation**

Clinical diagnosis	Clinical presentation			
	Sessile		Pedunculated	
	Frequency	Percentage	Frequency	Percentage
Epulis fissuratum	4	40	6	60
Pregnancy tumor	0	0	4	100
Pyogenic granuloma	38	46.9	43	53.1
Traumatic fibroma	120	60	80	40
Total	162	54.9	133	45.1

development of PG in pregnancy may be due to the increasing levels of estrogen and progesterone that occur as pregnancy progresses. This PG is referred to as PT.

Other lesions such as EF, PGCG and POF were equally distributed among the genders. EF appears as a single or multiple fold of tissue that grows in excess around the alveolar vestibule, which is the area where the gums meet the inner cheek. The appearance of an EF microscopically is an overgrowth of cells from the fibrous connective tissue. The epithelial cells are usually hyperkeratotic and irregular; hyperplastic rete ridges are often seen. PGCG is a relatively common tumor-like growth of the oral cavity, appears to be more common in the gingiva, which is in agreement with what has been reported in scientific literature.<sup>[6]</sup> PGCG microscopically shows large number of multinucleated giant cells, which can have up to dozens of nuclei. In addition, there are mesenchymal cells that are ovoid and spindle-shaped. POF was equally distributed in our study; but only an increased sample size can give an idea as to the exact sex predilection. It appears microscopically as a combination of a mineralized product and fibrous proliferation.



**Graph 2:** Distribution of 295 cases of reactive hyperplastic lesions according to histopathology (%)

Histopathological diagnosis of clinically diagnosed cases of TF and PG is FH and AH, respectively. In our study, 72.9% of the cases were FH and 17.7% were AH, which were clinically diagnosed as TF. On the other hand, clinically diagnosed PG cases resembled histopathologically FH (8.6%) and AH (76.5%). The histopathological versus clinical agreement test in 295 patients produced a Cohen kappa of 0.48. According to Landis and Koch Kappa,<sup>[11]</sup> scores of 0.41–0.60 indicate “moderate agreement.”

The clinical features of reactive hyperplasia of our patients were similar to those reported previously with divergence in some analyzed data. The novelty in our study was the correlation between histopathology and clinical features, which was not reported in literature until date.

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Nil.

### Conflicts of interest

There are no conflicts of interest.

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