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Clinicopathological Study of Oral Giant Cell Fibroma

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Abstract

Giant Cell Fibroma (GCF) is a relatively rare oral mucosal lesion, so named due to the characteristic giant cells present within the fibrous stroma of the lesion, limited number of clinicopathological studies were performed in previously published literature. This study was performed to evaluate the clinicopathological features of Giant cell fibroma in a sample of Iraqi patients. Formalin-fixed paraffin-embedded sections from 22 giant cell fibroma in period between 2010 and 2018 were retrieved from the laboratory of oral pathology of Baghdad University/College of Dentistry, Clinical data and microscopic features were reviewed and analyzed according to the available surgical reports. The mean age of patients at the time of diagnosis was 29.68 years with slight female predilections (1.4:1), the gingiva is the most common site of occurrence (36.4%), the lesions were 2-10 mm in greatest dimension. The most frequent provisional diagnosis is fibroma (54.5%) and papilloma (27.3%). Histologically, the distinctive diagnostic feature is the presence of mono, bi or multinucleated large stellate giant cells with a mean of 48.59 which is most numerous in the lamina properia beneath the epithelium.

Key words: *Clinicopathological, oral giant, cell fibroma*

Introduction

The giant cell fibroma is an oral soft tissue lesion with distinctive clinicopathological features. It was first described as a separate entity among fibrous hyperplastic soft tissue lesions by Weathers and Callihan in 1974 when 108 out of 2000 fibrous hyperplasia specimens fulfilled the criteria for GCF [1] , Unlike the traumatic fibroma, it does not appear to be associated with chronic irritation, [2] . GCF is an asymptomatic nodular mass less than 1 cm frequently occur in the gingiva, the surface may be smooth, lobulated or papillary so the lesion takes on the clinical appearance of a papilloma, almost occur before age 30 years, with a slight female predilection [3] . Histologically, the surface is stratified squamous epithelium, covering loose or dense fibrous stroma with numerous large stellate mono-bi or multinucleated giant cells. With well-demarcated cytoplasm, dendritic processes and surrounded by an artifactual space or separation of the collagen fibers from the cell boundaries.

Materials and methods

The study sample consisted of 22 GCF tissue blocks with their surgical reports retrieved from the files of the laboratory of oral pathology of Baghdad University/ College of Dentistry, from 2010 to 2018, the available clinical data (age, gender, site, provisional diagnosis, size of the lesion) was reviewed and analyzed. All tissue sections were processed routinely for H and E stain and examined under a light microscope (Olympus CH3), The clinical features were assessed in relation to site, sex, size, and age. number of giant cells was calculated in each case in 5 fields of a tissue section by experienced pathologists and correlated to the clinical information.Statistical analysis was performed using Statistical Package for Social Sciences (SPSS) version 25. The data presented as mean, standard deviation and ranges. Categorical data presented by frequencies and percentages. Independent t-test and Analysis of Variance (ANOVA) (two-tailed) was used to compare the continuous variables accordingly. Pearson's correlation test (r) was used to assess the correlation between continuous variables accordingly. Chi-square test was used to assess the association between provisional diagnosis and certain information. A level of P – value less than 0.05 was considered significant.

Results and Discusion

As showed in (table 1) The demographical and clinical data of 22 GCF cases revealed that the mean age was 29 years. A slight female predilection was recorded (59.1% versus 40.9%) with female to male ratio of 1.4:1. Gingiva is the most frequent site representing (36.4%), followed by tongue (27.3%), palate (18.2%), buccal mucosa (13.6%), and Lip (4.5%). the size of the lesion ranging from 2 to 12 mm with a mean of 4.8 mm and the largest lesion was seen in the posterior upper gingiva and buccal mucosa.

Oral Fibrous Hyperplasia(fibroma) is the most frequently missed provisional diagnosis (54.5%) followed by papilloma in (27.3%) which is mostly located on the tongue and palate of young aged patient, peripheral giant cell granuloma (P.G.C.G) and pyogenic granuloma in (9.1%), however, As showed in **(table 2)** statistically there is no significant association detected between provisional diagnosis and age, gender, and site as P value (0.121, 0.336,0.151) respectively.

The gross examination of the specimens of GCF (incisional and excisional biopsies) revealed white soft tissue lesions, the surface of the mass often appears papillary, the size of specimens ranged from 0.2 cm to 1.2 cm in diameter (figure 1) Microscopically sections showed a keratinized stratified squamous epithelium showing mild to moderate hyperplasia pseudo epitheliomatous hyperplasia was seen in 7 out of 22 cases with elongated and thick rete ridges, the underlying stroma consisted of dense collagenous fibrous tissue made of haphazardly arranged dense fiber bundles with mild to moderate amount of mixed inflammatory cells infiltrate (figure 2).

The most characteristic histological feature is the stellate shaped giant cells which are mono-bi or multinucleated with large hyperchromatic nuclei, these cells were mostly present in the subepithelial and interpapillary region and may have Short dendritic cytoplasmic processes and surrounded by an artifactual space or separation of the collagen fibers from the cell boundaries (Figure 3). The mean of the total number of giant cells in our study was 48.59 with 27.30 standard deviations. Statistically there is no significant association was detected between the number of giant cells and age, sex, and site of the lesion P value (0.8, 0.331, 0.077) respectively. The clinical features of GCF were described by five previous large-sample clinicopathological studies, GCF can occur at any age. The mean age of the patients was reported previously to be approximately 28 years in two studies [7,8] which was very close to the mean age of 29 years reported in the present study. The peak incidence is in the second decade of life, with about 60% of the lesions occurring in the first three decades. [1, 8,7] Our study found the highest incidence in the second and third decade, and approximately 60% of GCFs were in the first three decades. However, two previous studies have reported the highest incidence to be in the fourth decade of life. [9, 10], this discrepancy may be attributed to the asymptomatic nature of the lesion, genetic and racial differences. A slight female predominance for the occurrence was found in our study (59.1%) which is agreed with Four studies [1,7, 9,10] whereas disagreed with other studies that demonstrated no significant sex predilection. [8,11]

All previously mentioned studies stated that the most common location for GCF is the gingiva While The tongue is the second most common location followed by the buccal mucosa or palate that is in agreement with our study [1,7,8,10], the reported size of the lesion is 0.5-1 cm which is matching our results, however, the most accepted explanation to the largest size of lesion in the upper posterior gingival and buccal mucosal area is presence of trauma from occlusion in this site which lead to inflammation that may increasing the size. No GCF was diagnosed correctly at initial clinical presentation, GCF is misdiagnosed most often as fibroma, fibroepithelial polyp, or papilloma. [1,7,10] Comparable results were also found in the present study. The fibroma was reported in any location specially in buccal mucosa while the papilloma was frequently anticipated when the lesion appeared on the tongue or palate of the young and middle-aged patients because of the similarity in the shape, age, and site of these two lesions.

The histopathological features were in agreement with all previous literature; however, the presence of these peculiar giant cells and whether these cells were differentiated from a fibrous, histiocytic or neural lineage remains to be controversial. The pathogenesis of PEH Pseudoepitheliomatous hyperplasia (PEH) is still unclear, Pathologically, PEH arises due to the release of various cytokines produced by the tumor cells or inflammatory cells subsequently resulting in the proliferation of the overlying epithelium [12] therefore, the presence of PEH in GCF may be associated with inflammation that presented mostly in traumatic areas inside the oral cavity specially gingiva and buccal mucosa, however, in our

study, in addition to the mentioned anticipated sites, the PEH was noticed in GCF from different sites such as palate, tongue, and lip.

Conclusions

Though the clinicopathological features of giant cell fibroma are similar to the conventional fibroma/fibroepithelial polyp there are discriminative histopathologic features for giant cell fibroma that still a controversial issue in pathological literature that need further clinicopathological, immunohistochemical and molecular verification. A high index of suspicion and appropriate investigative workup is necessary for separate lesions to achieve a suitable diagnosis and offer appropriate therapy.

Table 1: Distribution of study patients by clinical information

Site of lesion	No	Percentage (%)	Sex		Age			Size
			Male 40%	Female 59%	< 20 year	20-35 year	>35 year	(mean size in mm)
Gingiva	8	36.4	6	4	2	2	4	5
Buccal Mucosa	3	13.6	1	2	0	1	2	9
Palate	4	18.2	4	0	2	2	0	3.8
Tongue	6	27.3	2	4	1	2	3	3.5
Lip	1	4.5	0	1	1	0	0	4

Table 2: Association between provisional diagnosis certain information

Variable	Provisional Diagnosis				Total (%) n= 22	P - value
	Fibroma n= 12	Papilloma n= 6	CGC n= 2			
Age (Years)						
< 20	2 (33.3)	2 (33.3)	0 (0.0)	2 (33.3)	6 (27.3)	**0.121**
20 - 35	6 (75.0)	2 (25.0)	0 (0)	0 (0)	8 (36.4)	
> 35	4 (50.0)	2 (25.0)	2 (25.0)	0 (0)	8 (36.4)	
Gender						
Male	4 (44.4)	4 (44.4)	0 (0.0)	1 (11.1)	9 (40.9)	**0.336**
Female	8 (61.5)	2 (15.4)	2 (15.4)	1 (7.7)	13 (59.1)	
Site of lesion						
Gingiva	4 (50.0)	0 (0.0)	2 (25.0)	2 (25.0)	8 (36.4)	**0.151**
Mucosa	3 (13.6)	0 (0.0)	0 (0)	0 (0)	3 (13.6)	
Palate	3 (50.0)	3 (50.0)	0 (0)	0 (0)	6 (27.3)	
Tongue	1 (25.0)	3 (75.0)	0 (0)	0 (0)	4 (18.2)	
Lip	1 (100)	0 (0)	0 (0)	0 (0)	1 (4.5)	

Figure (1): GCF grossly showing white nodular soft tissue mass

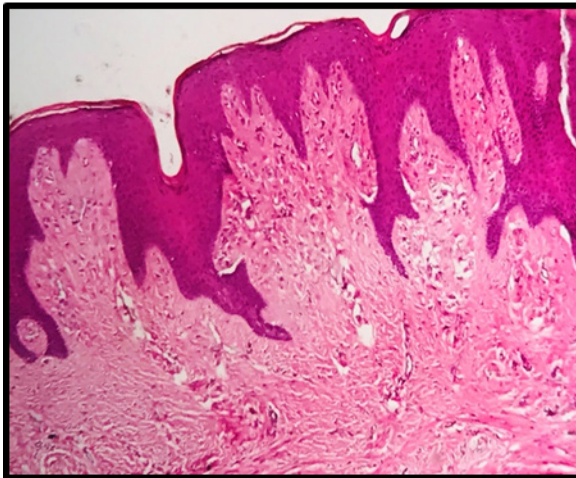

Figure (2) GCF covered with stratified squamous epithelium showing pseudoepithelumatous hyperplasia and thick collagenous stroma with few mixed inflammatory cells infiltrate

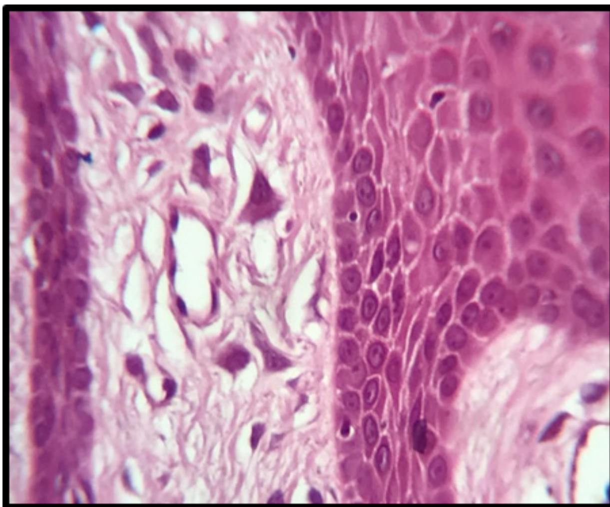

Figure (3) GCF showing stellate mono-bi and multinucleated cells, some with small dendritic process surrounded by an artifactual spacing

Conclusion

Formalin-fixed paraffin-embedded sections from 22 giant cell fibroma in period between 2010 and 2018 were retrieved from the laboratory of oral pathology of Baghdad University/College of Dentistry, Clinical data and microscopic features were reviewed and analyzed according to the available surgical reports. The mean age of patients at the time of diagnosis was 29.68 years with slight female predilections (1.4:1), the gingiva is the most common site of occurrence (36.4%), the lesions were 2-10 mm in greatest dimension. The most frequent provisional diagnosis is fibroma (54.5%) and papilloma (27.3%). Histologically, the distinctive diagnostic feature is the presence of mono, bi or multinucleated large stellate giant cells with a mean of 48.59 which is most numerous in the lamina properia beneath the epithelium

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Conflict of Interest: None to declare.

Ethical Clearance: All experimental protocols were approved under the College of Dentistry University of Baghdad and all experiments were carried out in accordance with approved guidelines.

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