ORIGINAL ARTICLE

Giant cell fibroma: A clinicopathological study

B Sabarinath, M Sivaramakrishnan, B Sivapathasundharam
Department of Oral Pathology and Microbiology, Meenakshi Ammal Dental College and Hospital, Maduravoyal, Chennai, India

Address for correspondence:
Dr. M Sivaramakrishnan,
Department of Oral Pathology and Microbiology,
Meenakshi Ammal Dental College and Hospital,
Maduravoyal, Chennai - 600 095, India.
E-mail: shivarocksmds@gmail.com

ABSTRACT

Objective: Giant cell fibromas (GCF) of the oral cavity are found predominantly in Caucasians and rarely in other races. This retrospective study was done to evaluate the clinicopathological features of GCFs in a sample of Indian population. **Materials and Methods**: 21 oral GCF cases were investigated from the year 1995 to 2010. Clinical data and microscopic features were reviewed and analyzed. **Results**: The mean age of patients at the time of diagnosis was 39years. Oral GCF occurred in patients between 6 and 67 years of age. The lesions were 4-17 mm in greatest dimension. GCF frequently has the provisional diagnosis of fibroma or papilloma. All tumors were treated by total surgical excision and no recurrence was reported. The consistent and diagnostic feature was the presence of large stellate giant cells, usually with one or two nuclei. Multinucleated giant cells were seen occasionally. These giant cells were most numerous in the connective tissue beneath the epithelium. **Conclusion**: Though there are distinct histopathologic features for GCF, its clinical presentation and prognosis are similar to the conventional fibroma/fibroepithelial polyp.

Key words: Giant cell, fibroma, giant cell fibroma, histopathology

INTRODUCTION

The giant cell fibroma is an interesting non-neoplastic lesion of the oral mucosa.[1] The GCF was first described as a separate entity among fibrous hyperplastic soft tissue lesions by Weathers and Callihan in 1974.[2] It was named for its characteristically large, stellate-shaped, mononuclear and multinucleated giant cells. They examined more than 2,000 specimens in a group of fibrous hyperplasias, and 108 met their criteria for this "new" lesion which they called GCF.[3]

Before Weathers' and Callihans' distinction of GCF, Eversole and Rovin compared and contrasted 279 fibrous hyperplastic gingival lesions, which fell into four categories: Pyogenic granuloma, peripheral gingival fibroma, peripheral giant cell granuloma, and peripheral ossifying fibroma. Each has its own diagnostic histopathologic characteristics but exhibit overlap of clinical presentation.[4]

Speculations from the study were that all four types of lesions are merely varied histologic responses to common etiologic factors,[5] but similar to one another and to other fibrous hyperplasias. GCFs are often mistaken for papilloma or fibroma because of their papillary surface and fibrous or elastic nature, respectively.[6-10]

Very few case reports are seen regarding this tumor and controversy regarding the origin of this lesion continues.[1] This retrospective study was aimed to evaluate the clinicopathological features of GCFs in the sub continent population.

MATERIALS AND METHODS

The study group consisted of 21cases of GCF from 609 fibrous lesions, retrieved from the files of the Department of Oral Pathology Microbiology, Meenakshi Ammal Dental College, Chennai, from 1995 to 2010. All lesions were excised in toto. The tissues were processed for routine H and E stain and examined under light microscope.

RESULTS

The demographic and clinical data of 21 cases of GCF are presented in Table 1. The mean age of patients at the time of diagnosis was 39 years (6-67 years). GCF occurred more frequently in patients in the second to fourth decades of life. There were 12 male and 9 female patients. The lesion occurred more frequently on the mandibular gingiva (9 cases), maxillary gingiva (5 cases) [Figure 1], tongue (3 cases), and

Access this article online
Quick Response Code:
Website: www.jomfp.in
DOI: 10.4103/0973-029X.102485

two cases each on the buccal mucosa [Figure 2] and the hard palate.

Microscopically, all the cases revealed dense collagenous fibrous tissue made of haphazardly arranged dense fiber bundles [Figure 3]. Stellate shaped giant cells were seen in the connective tissue immediately below the epithelium [Figure 4] with short dendritic processes and large hyperchromatic nuclei. Artifactual spacing was observed surrounding these giant cells. Overlying epithelium was keratinized stratified squamous showing mild hyperplasia, with elongated and thick rete ridges. Based on the microscopic findings, all the cases were diagnosed as giant cell fibroma.

DISCUSSION

GCF is a fibrous hyperplastic lesions of the oral cavity with distinctive clinicopathology unlike traumatic fibroma.[1] Giant Cell Fibroma is a relatively rare fibrous hyperplasic lesion that could be diagnosed only on histopathological examination. It is a reactive lesion that was considered to occur due to chronic irritation[10] and is characterized by functional changes in the fibroblastic cells.[11] A possible virus induced proliferative etiology was also proposed, but remains unclear.[12]

Though GCF can occur at any age, the mean age reported was approximately 29 years in previous studies.[5] The mean age of occurrence in the present study is 39 years [Table 1]. This discrepancy may be attributed to its asymptomatic nature or patients delayed reporting or due to genetic and racial differences.

Clinically GCF is asymptomatic and appears as pedunculated [Figure 2] or sessile fibrous lesion with the color of normal mucosa, measuring 0.5-1 cm with a pebbly surface [Figure 5]. The surface might be ulcerated due to acute trauma. It is found more frequently on the gingiva, followed by the tongue and the buccal mucosa.[13] In the present study also, gingiva is the most common site in the oral cavity [Table 2].

Four studies have shown a slight female preponderance for the occurrence of GCF[4,6,7,9] whereas another study has demonstrated no significant sex predilection.[7] We found slight male predominance (M:F=12:9).

Clinically suggesting, majority of oral giant cell fibromas are unrelated to the histologically similar fibrous papule of the nose or facial angiofibroma.[14] None of the 21 lesions were diagnosed correctly as GCF at the time of initial clinical presentation. The most frequent clinical diagnosis was fibroma or traumatic fibroma. Although it remains controversial whether to distinguish GCF from other forms of fibrous hyperplasia, most authorities have listed it as a separate entity because of its distinctive histopathologic characteristics and ultra structure.[1]

Histologically the lesions are characterized by a diffuse, somewhat immature, rather avascular collagenic stroma with small bipolar and slightly stellate fibroblasts scattered throughout in moderate numbers. Occasional fibroblasts will be quite large and angular, and may have more than one nucleus. GCF is characterized by the presence of numerous large stellate and multinucleated giant cells in a loose collagenous

Table 1: Table exhibiting location and age

Sex	Age (yr)	Location	Size (mm)	Provisional diagnosis
M	39	Gingiva, lower posterior	5×4	Fibroma
M	67	Gingiva, lower posteriors	5×10	Fibroepithelial polyp
M	33	Gingiva, in #47,48	5×4	Fibroma
F	36	Retromolar, in #48	17×14	Fibroma
F	55	Retromolar, in #48	15×15	Fibroma
F	39	Retromolar, in #38	5×4.5	Traumatic fibroma
M	60	Retromolar, in #48	12×3	Traumatic fibroma
M	40	Gingiva, Upper anterior region	10×10	Fibroma
M	67	Gingiva, Lower anterior region	5×10	Fibroepithelial polyp
F	9	Gingiva, in #11, 21	6×5	Fibroma
M	35	Tongue, tip	4×5	Traumatic fibroma
M	40	Tongue, tip	5×5	Traumatic fibroma
M	45	Tongue, lateral border	5×5	Traumatic fibroma
F	37	Buccal mucosa, in # 46	8×5	Traumatic fibroma
F	45	Hard palate, anterior	7×5	Papilloma
M	42	Maxillary Gingiva	6×4	Fibroma
M	39	Mandibular Gingiva	6×5	Traumatic Fibroma
F	43	Hard palate	4×5	Papilloma
M	40	Maxillary Gingiva	6×5	Fibroepithelial polyp
F	38	Mandibular Gingiva	5×3	Traumatic fibroma
F	41	Tongue	7×2	Papilloma

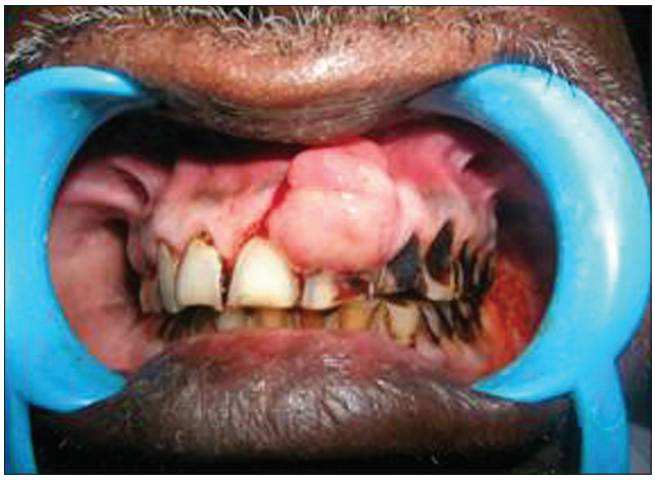

Figure 1: lobulated growth in the maxillary gingiva

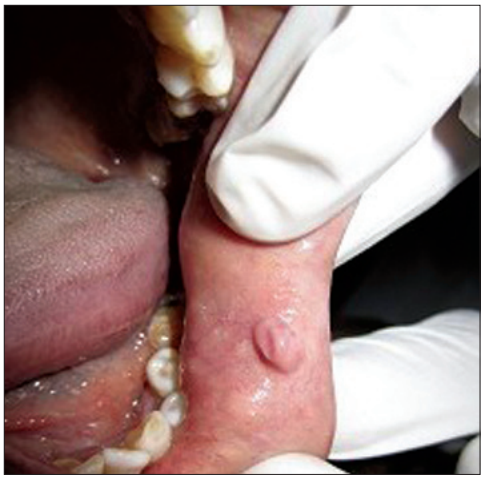

Figure 2: Pedunculated growth in left buccal mucosa

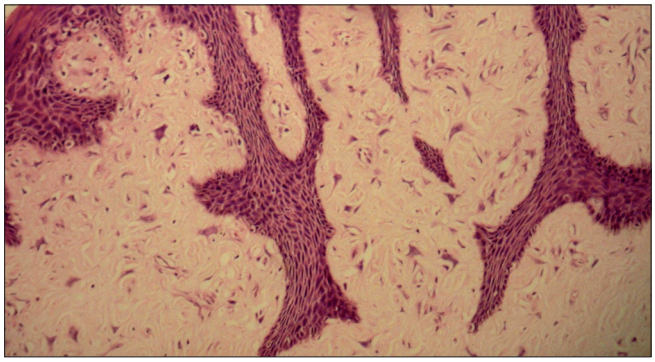

Figure 3: Haphazardly arranged dense fiber bundles exhibiting slightly stellate fibroblasts scattered throughout in moderate numbers (H and E stain, 20×)

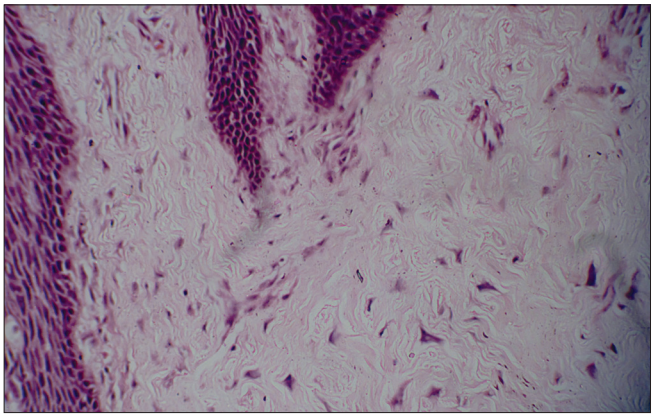

Figure 4: Artifactual spacing was observed surrounding the giant cells (H and E stain, 20×)

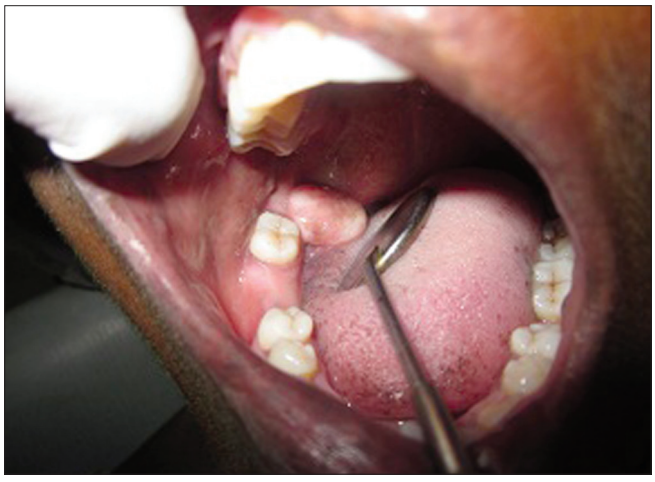

Figure 5: Pebbly appearance in right retromolar region

Table 2: Table exhibits the lesion distribution sites

Site	Mandible -gingiva	Maxilla -gingiva	Tongue	Buccal mucosa	Hard palate
No. of cases	9	5	3	2	2
Percentage	1.89	1.05	0.63	0.42	0.42

stroma [Figures 3 and 4]. These pathognomonic cells are never hyperchromatic, as they would be if they were truly dysplastic fibroblasts, and they often have a smudged appearance.[15]

Mechanisms of fusion of macrophages to form giant cells are extensively studied. Three main mechanisms have been put forth.[16]

1. In immune mediated phenomenon, large amounts of lymphokines are produced that causes fusion of macrophages which results in the formation of multinucleated giant cells (Galndo *et al*., 1974).[16]
2. Fusion occurs between young and older cells, the stimulus being the recognition of alterations in cell surface by young macrophages (Mariano *et al*., 1974).[16]
3. Simultaneous attempted phagocytosis, where in 2 or more macrophages try to ingest same particle at the same time results in the fusion of endosomal margins and form multinucleated giant cells (Chambers *et al*., 1978).[16]

GCF has abundance of dense collagen fibres which is responsible for the clinical appearance of firm fibroma like mass. GCF and other common fibrous hyperplasias like fibromas, fibroepithelial polyps show similar histopathologic

features, but presence of numerous stellate giant cells differentiates GCF from other similar lesions. Histopathologic examination of the lesions in this study also correlates with the findings in earlier studies.

Ultrastructural examination has suggested that the stellate and multinucleated giant cells are unusual fibroblasts.[17,18] Electron microscopic and immunohistochemical study revealed that this giant fibroblast are identified as atypical fibroblasts and formed by fusion of mononuclear cells.[19] These cells have intracellular microfilament.

Several immunohistochemical studies have been performed to determine the origin of these giant cells. Giant fibroblasts showed negative reactivity for cytokeratin, neurofilament, HHF, CD 68, HLA DR, Tryptase and S 100 protein.[12] The results showed positive staining only for vimentin and prolyl-4 - hydrolase.[7,8,14,20-22] This suggests that the stellate and multinucleate cells of GCF have a fibroblast phenotype.[11] Histochemical and immunohistochemical studies have also revealed that fibroepithelial polyps contain elastin but GCF does not. This is the distinct difference in the extracellular matrix between GCF and fibroepithelial polyp.[22] Further minor subsets of giant cells in few cases showed positivity for factor XIIIa indicating that stellate cells may be of fibroblastic lineage with variable mixture of cells from mucosal dendrocytes.[20]

The choice of treatment for GCF is surgical excision in adults whereas in children electrosurgery or laser excision is preferred.[1] Recurrence was noted in two of 464 cases reported by Houston. One lesion recurred once and the other twice.[6] In the present study, all GCFs were excised surgically and no recurrence was reported so far.

CONCLUSION

Though there is distinct histopathologic features for GCF, its clinical presentation and prognosis are similar to the conventional fibroma/fibroepithelial polyp. A high index of suspicion and appropriate investigative work up is necessary for separate lesions in order to arrive at a suitable diagnosis and offer appropriate therapy.

REFERENCES

1. Butchi babu K, Nag S, Hussain MW, Mishra A. Laser excision of giant cell fibroma - A report of a case and review of literature. Annals and essences of dentistry 2010;2;221-4.
2. Rajendran R, Sivapathasundharam B. Shafers Text Book of Oral Pathology. 6th edition. Philadelphia: Elsevier publications;2006. p. 127.
3. Lukes SM, Kuhnert J, Mangels MA. Identification of a giant cell fibroma. J Dent Hyg 2005;79:9.
4. Weathers DR, Callihan MD. Giant cell fibroma. Oral surg oral med oral pathol 1982;53:582-7.
5. Kuo RC, Wang YP, Chen HM, Sun A, Liu BY, Kuo YS. Clinicopathological study of oral giant cell fibromas. J Formos Med Assoc 2009;108:725-9.
6. Houston GD. The giant cell fibroma. A review of 464 cases. Oral Surg Oral Med Oral Pathol 1982;53:582-7.
7. Bakos LH. The giant cell fibroma: a review of 116 cases. Ann Dent 1992;51:32-5.
8. Magnusson BC, Rasmusson LG. The giant cell fibroma. A review of 103 cases with immunohistochemical findings. Acta Odontol Scand 1995;53:293-6.
9. Wang Z, Levy B. Clinico-pathological study on giant cell fibroma of oral mucosa. Zhonghua Kou Qiang Yi Xue Za Zhi 1995;30:332-3, 383.
10. Savage NW, Monsour PA. Oral fibrous hyperplasias and the giant cell fibroma. Aust Dent J 1985;30:405-9.
11. Campos E, Gomez RS. Immunocytochemical study of giant cell fibroma. Braz Dent J 1999;10:89-92.
12. Reibel J. Oral fibrous hyperplasias containing stellate and multinucleated cells. Scand J Dent Res 1982;90:217-26.
13. Okamura K, Ohno J, Iwahashi T, Enoki Netal . Giant cell fibroma of tongue: A report of case showing unique S-100 protein and HLA-DR immunolocalization with literature review. Oral Med Pathol 2009;13:75-9.
14. Odell EW, Lock C, Lombardi TL. Phenotypic characterisation of stellate and giant cells in giant cell fibroma by immunocytochemistry. J Oral Pathol Med 1994;23:284-7.
15. Regezi JA, Courtney RM, Kerr DA. Fibrous lesions of the skin and mucous membranes which contain stellate and multinucleated cells. Oral Surg Oral Med Oral Pathol 1975;39:605-14.
16. Williams GT, Williams WJ. Granulomatous inflammation-a review. J Clin Pathol 1983;36:723-33.
17. Takeda Y, Kaneko R, Suzuki A, Niitsu J. Giant cell fibroma of the oral mucosa. Report of a case with ultrastructural study. Acta Pathol Jpn 1986;36:1571-6.
18. Mighell AJ, Robinson PA, Hume WJ. PCNA and Ki-67 immunoreactivity in multinucleated cells of giant cell fibroma and peripheral giant cell granuloma. J Oral Pathol Med 1996;25:193-9.
19. Kuo RC, Wang YP, Chen HM, Sun A, Liu BY, Kuo YS. Clinicopathological study of oral giant cell fibromas. J Formos Med Assoc 2009;108:725-9.
20. Souza LB, Andrade ES, Miguel MC, Freitas RA, Pinto LP. Origin of stellate giant cells in oral fibrous lesions determined by immunohistochemical expression of vimentin, HHF-35, CD68 and factor XIIIa. Pathology 2004;36:316-20.
21. Weathers DR, Campbell WG. Ultrastructure of the giant-cell fibroma of the oral mucosa. Oral Surg Oral Med Oral Pathol 1974;38:550-61.
22. Sivapathasundharam B. Giant cell fibroma-report of four cases and review of literature. JIDA 2007;72:19-21.

How to cite this article: Sabarinath B, Sivaramakrishnan M, Sivapathasundharam B. Giant cell fibroma: A clinicopathological study. J Oral Maxillofac Pathol 2012;16:359-62.

Source of Support: Nil. **Conflict of Interest:** None declared.