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Case Report

Unrevealing the enigma of an oral lump: a comprehensive study of unique histopathological features of giant cell fibroma treated with 940 nm diode laser

Mansi Takalkar*, Shruti Karvekar, Vilas Pattar, Shweta Hugar, Shahanaz Shaik, Roohu Rajinder Kumar

Department of Periodontics, KAHER'S V. K. Institute of Dental Sciences, Belagavi, Karnataka, India

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***Correspondence:**
Dr. Mansi Takalkar,
E-mail: mstakalkar1997@gmail.com

ABSTRACT

Connective tissue of oral cavity when exposed to several aetiologies develops a wide range of lesions with particular characteristics. Giant cell fibroma (GCF) has overlapping clinical features with other hyperplastic lesions therefore require a detail histopathological examination. A 58 years old patient with soft tissue overgrowth on left buccal mucosa was excised with 940 nm soft tissue diode laser (Biolase) and the excised tissue was sent for biopsy. Histopathological examination gave a differential diagnosis of GCF, the excision was done using 940 nm laser with uneventful procedure. Patient was recalled after 15 days for follow up, the healing was completed without scar tissue formation. Detailed knowledge about the particular characters of a pathology will help in accurate diagnosis and treatment planning. A clinically normal case may have a significant hidden features which should be followed and searched.

Keywords: GCF, Biolase, Histopathology, Oral soft tissue overgrowth

INTRODUCTION

The connective tissue of oral mucosa has various fibrous tissue arranged in reticular manner. This fibrous tissue when exposed to various pathologic etiologies leads to excessive growth called "fibrous hyperplasia".[2] These fibrous hyperplastic growths are very common in oral cavity and are manifested at various regions.[1] These lesions are also called as fibrous hyperplasia, fibro epithelial polyps, or, simply, fibromas. Till early 1970s GCF was considered as one of these hyperplastic lesions.[2]

The GCF was first described as a distinct entity by Weathers and Callihan in 1974.[1] Clinically the lesion has similar clinical presentation as other hyperplastic lesion, it differ only histopathologically.[2] GCF arises from unknown etiological origin which was once thought to have viral origin but not justified.[3] Clinically, they are more common in the mandible than the maxilla, and they can be sessile or pedunculated, affecting the gingival tissue.[4] These lesion and even all the fibrotic growths can be treated in various ways. The completely excision is a treatment of choice as recurrent rate is minimum especially in case of GCF. Surgical excision of such should be done conservatively with ensuring the good healing after excision. Therefore, excision using laser proves a better choice which ensures minimum bleeding, trauma and better wound healing and patient compliance.[5]

Therefore, aim of this study is to have a comprehensive discussion of the unique histopathological characteristics of GCF and to present a case report of 58 year old patient; treated by soft tissue diode laser.

CASE REPORT

A 58 year old patient referred to the department of periodontics with the chief complaint of swelling on left side of cheek since four years. It was smaller in size earlier but grown in size gradually. The lesion was asymptomatic and presented stable in shape and colour. 2 years back patient had undergone extraction of tooth number 35, 36 due to dental caries. Patient gave medical history of hypertension for 3 years and on medication for the same (telmate). On intraoral examination a pediculated soft tissue nodule measuring 17×12 mm was noticed on the left buccal mucosa (Figure 1). The lesion was non-haemorrhagic, of soft consistency, covered by intact whitish pink colour mucosa. Rest of oral mucosa is normal with poor oral hygiene.

Figure 1: Intraoral position and clinical picture of giant cell fibroma.

The clinical findings of patients lead toward the diagnosis of primarily hyperplastic benign lesion such as traumatic fibroma, peripheral ossifying fibroma, peripheral odontogenic fibroma, and giant cell fibroma and odontogenic hamartoma. The fibrotic appearance and chronic nature of this lesion is mimicking the hyperplastic lesions of oral mucosa.

Description of clinical procedure

For the removal of the tissue the 'epic × biolase' diode laser with wavelength of 940 nm with a 300-µm-diameter optic fibre at 2.0 W power output is used to excise the tissue. Photobiomodulation dose of 4 J/cm^2 at (0.1 W output for 60 seconds) was given on the wound after excision. The operation was performed without bleeding. The excised tissue was fixed in 10% formalin and was sent for histopathological examination.

During the subsequent days after the surgery, no pain medication was required and no pain or discomfort was reported by the patients. The wounds healed properly and no scarring could be seen in the region of the surgery

Histopathological characteristics

H and E section shows 2 pieces of tissue consisting of parakeratinized stratified squamous epithelium with elongated rete pegs. Focal areas show cross section of the epithelium with entrapped connective tissue core. The underlying connective tissue is fibrous and vascular with absence of inflammation.

Juxta-epithelially numerous stellate shaped giant fibroblasts are seen. Few of the plumped stellate shaped fibroblasts exhibit multinucleation suggestive of giant cell fibroblasts. The underlying connective tissue stroma is fibrous with loose to dens haphazardly arranged bundles of thick short Fibrils of interlacing collagen fibres with numerous plump to spindle shaped fibroblasts. The stroma is vascular with numerous small to large endothelial lined blood vessels with RBCs interspersed throughout. Focal areas show vacuolated cells with eccentrically nuclei suggestive of adipose tissue.

Figure 2: Excised tissue sent for histopathological examination.

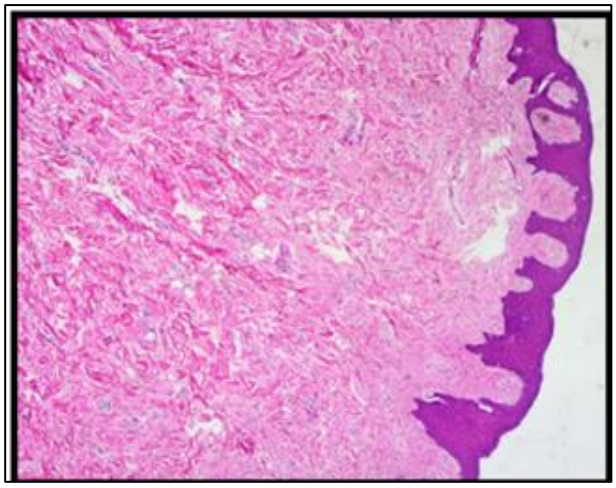

Figure 3: Histologic focus showing parakeratinized stratified epithelium with elongated rete pegs.

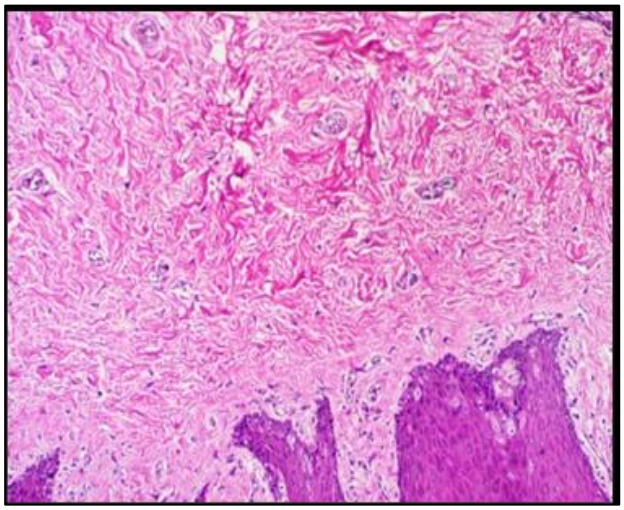

Figure 4: Histologic focus showing dense bundles of collagen fibers.

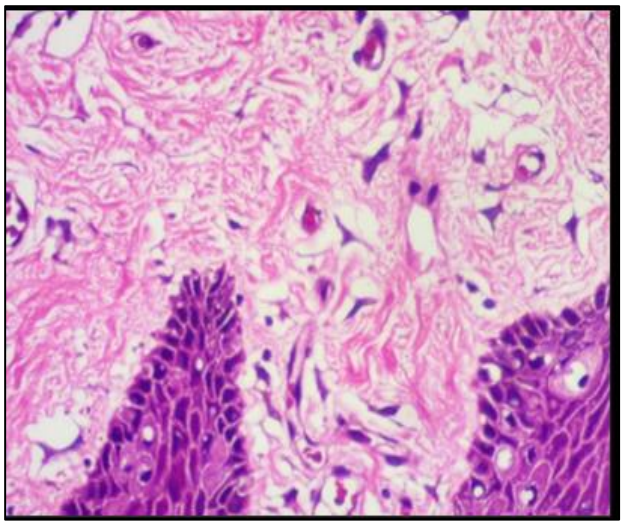

Figure 5: Histologic focus showing multinucleated giant cell fibroblasts.

Figure 6: Diode laser used (Biolase).

DISCUSSION

The changes in the fibroblasts functional status are primarily caused by minor trauma.[4] Giant cell fibroma is a non-neoplastic growth with special histopathological characteristics and comprises 3-5% of all overgrowths. The lesion presents primarily in young age, mainly in first 3 decades of life; contrary to this the present case has been reported in 5th decade of her life.[6]More often than maxillary gingiva, mandibular gingiva is impacted, then tongue and palate.[5]

Its name comes from the fact that this lesion has several plump, stellate-shaped fibroblasts that are present under a microscope. According to Regezi et al stellate cells are most frequently observed in oral lesions that occur on the gingival or palate, where the sub mucosa is primarily made up of lamina propria.[7] stellate cells are also dependent on the arrangement of collagen in the lamina propria.

Clinically it appears as a pedunculated, pearly nodule of various sizes, with a differential feature of color which is same as that of oral mucosa.as the clinical features of this lesion overlap with many; in a study done by Sabarinath et al. they could not identify the correct lesions only from clinical features.[8] Therefore various clinically similar lesions such as ossifying fibroma need a histopathological examination for the diagnosis, as the ossifying fibroma shows several osteogenic cell islands.[9]

Whereas lesions like retrocuspid papilla have similar histological features of giant cell fibroblasts which can be differentiated by clinically as it represents as a pink papule with bilateral distribution.[10]

Apart from general microscopic features of vascular fibrous, loosely arranged connective tissue the A distinctive feature that builds GCF apart from other fibromas is the presence of large, angular or stellate, multinucleated, plump/spindle-shaped, non-hyperchromatic atypical fibroblasts that appear as giant cells in the periphery of the lesion while typical fusiform

fibroblasts are found in the central areas.[10] Corrugated and atrophic epithelium with thin, elongated rete ridges is closely related to these stellate fibroblasts, which are seen inside the superficial connective tissue.[1]

Any of the treatment modalities weather surgical or laser excision with periodic follow ups shows better results. The advantage of using laser lies in clear surgical field which offers better visualization, faster healing, less postoperative pain and scarring as well as better patient acceptance. Although electrosurgery and radiosurgery offers better haemostasis as compared to scalpel, photobiomodulation offers additional benefit of faster wound healing.it is not suitable for excisional biopsy of reactive gingival lesions because of regressive tissue changes due to thermal injury and delayed healing.[11] The fact that diode laser excision results in little changes to the biopsy specimen's microarchitecture, as shown in the literature, is another compelling reason in favour of using laser. No apparent thermal damage was observed in the biopsy tissue as the laser was used in pulse mode. An additional benefit of the diode laser was the absence of any soft tissue defects and the smooth wound healing following excision.[5]

Thereby, without sacrificing the histological diagnosis of the lesion, diode laser therapy may be an effective replacement for traditional surgical excision, with improved patient acceptance, simplicity of administration, better healing, and aesthetic restoration. However, to assess the long-term outcomes, including recurrence, following diode laser excision, clinical trials with prolonged follow-up are necessary.

CONCLUSION

The general non-symptomatic overgrowths in oral cavity with overlapping clinical presentations should be considered extensively. This will lead to diagnosis of rare entities with unique histological features in routine dental practices. Also, treatment planing with minimum trauma and better postoperative results will be gain more patient acceptance and satisfaction.

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REFERENCES

1. Weathers DR, Callihan MD. Giant-cell fibroma. Oral Surg Oral Med Oral Pathol. 1974;37(3):374-84.
2. Sanjeeta N, Nandini DB, Banerjee S, Devi PA. Giant cell fibroma: A case report with review of literature. J Med Radiol Pathol Surg. 2018;5(4):11.
3. Sekar B, Augustine D, Murali S. Giant Cell Fibroma-A Case Report with Review of Literature. Indian J Dental Sci. 2011;3(5):48-50.
4. JimSon S. Giant cell fibroma: a case report with immunohistochemical markers. J Clin Diagnostic Res. 2013;7(12):3079.
5. Chawla K, Lamba AK, Faraz F, Tandon S, Ahad A. Diode laser for excisional biopsy of peripheral ossifying fibroma. Dental Res J. 2014;11(4):525.
6. Vergotine RJ. A giant cell fibroma and focal fibrous hyperplasia in a young child: a case report. Case reports in dentistry. 2012;2012(1):370242.
7. 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(4):605-14.
8. Sabarinath B, Sivaramakrishnan M, Sivapathasundharam B. Giant cell fibroma: A clinicopathological study. J Oral Maxillofacial Pathol. 2012;16(3):359-62.
9. Mahavir MB, Kundendu AB, Mishra S. Peripheral ossifying fibroma. J Oral Maxillofacial Pathol. 2011;15(1):65-8.
10. Fowler CB. Benign and malignant neoplasms of the periodontium. Periodontology 2000. 1999;21(1):33-83.
11. Butchibabu K, Nag S, Hussain MW, Mishra A. Laser Excision of A Giant Cell Fibroma-Report of A Case and Review of Literature. Ann Essences Dentistry. 2010;2(4):221-4.

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