

Gingivectomy as a Treatment Option for Gingival Enlargement Induced by Orthodontic Treatment: A Case Report

Sharayu Dhande^{1*}, Rashmi Hegde², Sangeeta Muglikar³, Mariam Khan⁴, Yusuf Meeyajiwala⁵, Ajit Kalia⁶ and Vasu Patil⁷

Abstract

Orthodontic therapy includes use of orthodontic appliances that favour plaque retention further causing inflammation of the underlying periodontium. This inflammation if left untreated further progresses to gingival enlargement. Bulky interdental papillae in gingival enlargement further act as an area of plaque retention thereby preventing the plaque control and thus worsening the periodontal condition of the patient. Diagnosis of such enlargements is carried out with co-relation of clinic radiographic findings and histopathological findings. Although with the advancements in technology, a variety of treatment options like laser excision, chemosurgery, cryotherapy, electrosurgery, sclerotherapy is available nowadays but surgical excision still remains the treatment of choice. This case report focusses on treating the gingival hyperplasia with surgical excision along with stringent follow-up and patient education regarding different plaque control practices to be followed during on-going orthodontic therapy in order to reduce chances of recurrence.

Keywords: Gingival enlargement; Excisional biopsy; Orthodontic therapy; Plaque; Gingival hyperplasia.

Introduction

Fauchard in 1742 first described gingivectomy to remove excess gingival tissue. Pyorrhea extermination: gingivectomy, the rationale and treatment were published by William in 1921.

¹BDS, Pg. Student, Department of Periodontology and Oral Implantology, M A Rangoon Wala College of Dental Science and Research Centre, Pune, India

²MDS, Associate professor, Department of periodontology and oral implantology, M A Rangoon Wala College of Dental Science and Research Centre, Pune, India

³MDS, Professor and head of department, Department of periodontology and oral implantology, M A Rangoon Wala College of Dental Science and Research Centre, Pune, India

⁴BDS, Private practitioner, M A Rangoon Wala College of Dental Science and Research Centre, Pune, India

⁵BDS, Pg. Student, Department of orthodontics and dentofacial orthopaedics, M A Rangoon Wala College of Dental Science and Research Centre, Pune, India

⁶MDS, Professor and head of department, Department of orthodontics and dentofacial orthopaedics, M A Rangoon Wala College of Dental Science and Research Centre, Pune, India

⁷MDS, Reader, Department of orthodontics and dentofacial orthopaedics, M A Rangoon Wala College of Dental Science and Research Centre, Pune, India

***Corresponding Author:** Sharayu Dhande, Department of Periodontology and Oral Implantology, M A Rangoon Wala College of Dental Science and Research Centre, Pune, India.

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In this he stated that out of 2500 teeth i.e., over 90 % patients were treated gingivectomy and had yielded better results [1]. Gingival hyperplasia is defined as an increase in the size of the gingiva, and could arise cause of a multifactorial pathology like systemic factors and environmental factors [2]. Inflammatory gingival enlargement further could be classified as acute or chronic, wherein chronic changes are much more common. It can be caused by systemic hormonal disturbances or can be plaque induced. These overgrowths lead to functional disturbances like difficulty in speech, mastication and hamper aesthetics [3].

In 1994, bokenkamp et al graded gingival overgrowth: 0: No sign of enlargement grade. 1: Enlargement confined to dental papilla grade, 2: Enlargement involving dental papilla and marginal gingiva grade, 3: Enlargement covering three-quarters of crown of tooth or more [4]. Gingival overgrowths are common in patients undergoing orthodontic treatment for 18 months or more using fixed orthodontic appliances [5]. These overgrowths further show increased tendency for plaque retention which promote inflammation of gingiva. On the other hand, the use of orthodontic bands also causes gingival irritation [6].

There is increased tendency for plaque accumulation due to bulky papillae in some patients hampering the plaque control and thus increasing gingival inflammation and plaque retention. One of the important aspects of treatment outcomes is patient compliance. Treatment modalities involve obtaining a detailed medical history followed by non-surgical periodontal therapy. Further surgical

excision wherever overgrowth persists [7,8]. Nickel ions present in metal orthodontic brackets could be one of the causes for fibroblastic proliferation leading to gingival hyperplasia [9,10].

Thus, it is necessary for a patient undergoing orthodontic treatment to be periodontally evaluated and be in optimal periodontal health for the treatment to be predictable and successful. Patient education and motivation regarding plaque control is one of the important aspects of maintenance phase [11,12]. The following case report focusses on treatment of gingival overgrowth in patients undergoing fixed orthodontic treatment.

Case presentation

A 24-year-old patient reported to the department of periodontology and oral implantology with a chief complaint of swelling in the gums in upper front region of the jaw for 2-3 months. The enlargement was initially smaller in size which gradually increased to the present size and caused difficulty in mastication and also resulted in food lodgement. The enlargement was non-tender, non-purulent in nature. On general examination vital signs were normal.

The initial line of treatment was phase I therapy included ultrasonic scaling and root planning followed by 2 weeks of maintenance with proper brushing techniques and patient was advised oral mouth rinse of 0.12% chlorhexidine mouthwash twice a day for a week. Routine haematological investigations were performed and a written informed consent was obtained from the patient (Figure 1 a,b,c).



Figure 1: (a) Pre operative lateral view (right side); (b) Pre operative frontal view; (c) Pre operative lateral view (left side).

On follow-up examination a complete reduction in inflammation and bleeding on probing was observed but enlarged gingiva remained soft and friable. As a result, gingivectomy was considered as the treatment of choice. In surgical phase, local anaesthesia (2% lignocaine hydrochloride) was infiltrated in to the surrounding tissues. Bleeding points were marked with

pocket marker. Surgical excision with internal bevel gingivectomy was carried out and orban's knife was used to remove interdental soft tissue. Remaining tissue tags were removed with a help of a universal curette, interdental papillae were trimmed. Intra-operative bleeding was controlled using pressure packs with gauze soaked in local anaesthesia (Figure 2 a,b).

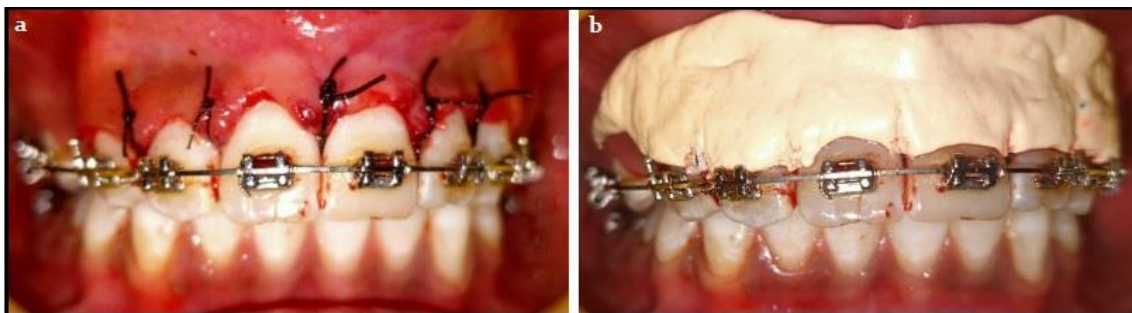


Figure 2: (a) Surgical phase: Internal bevel gingivectomy; (b) Placement of coe-pak.

Patient was recalled a week later for suture removal. Following which genioplasty with diode laser was performed not only to

enhance aesthetics but also to cauterize the margins in order to prevent recurrence (Figure 3 a,b).



Figure 3: (a) Excised overgrowth; (b) Gingivoplasty with diode laser.

Post operative instructions were explained to the patient. The patient was prescribed antibiotics (tab ordent, b.i.d for 5 days) with analgesics (tab ketorol dt, b.i.d for 5

days) with an antacid (tab pan 40, twice daily for 5 days, half an hour before food). Patient was recalled after a week for suture removal (Figure 4).



Figure 4: One-week post-operative follow-up.

Patient was enforced to improve oral hygiene upon every visit. At the end of 1

month, the patient was completely satisfied with the functional and aesthetic outcome (Figure 5 a,b).



Figure 5: (a) One-month post-operative follow-up; (b) Six-months post operative follow-up.

The patient asked to visit for regular follow-up for 9-months. The excised lesion

was further sent to the Department of Oral Pathology in 10% formalin for histopathological examination (Figure 6).



Figure 6: Nine-months post-operative follow-up.

Provisional Diagnosis

Inflammatory gingival enlargement

Differential Diagnosis

Inflammatory gingival enlargement, traumatic gingival enlargement.

Final Diagnosis

The final diagnosis based on co-relation of clinical and histopathologic findings: gingival hyperplasia.

Radiographic interpretation

Radiographic diagnosis was carried out from an orthopantomogram (OPG). Neither any bone loss nor any peri-apical radiolucency noted (Figure 7).

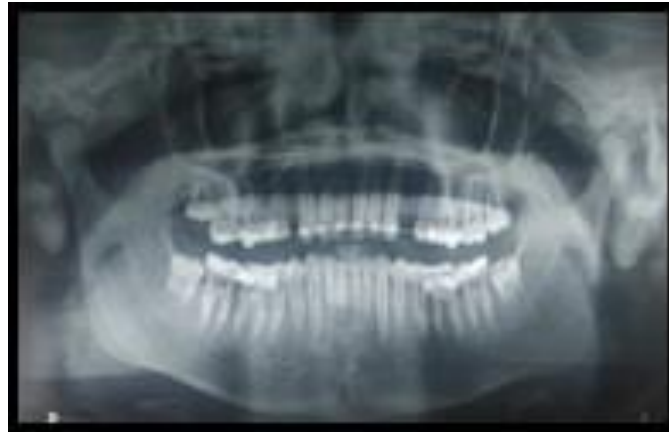


Figure 7: Orthopantomogram.

Histopathology

The H and E section studied shows presence of overlying epithelium and underlying connective tissue. The overlying epithelium is para-keratinized stratified squamous in nature and shows presence of long and slender rete ridges. The underlying connective tissue shows dense

and diffuse chronic inflammatory cell infiltrate chiefly comprising of lymphocytes and plasma cells. Numerous endothelium lined capillaries can be noted. Occasional areas of haemorrhage noted surrounding loose, oedematous fibro-cellular stroma. Overall findings are suggestive of “gingival hyperplasia” (Figure 8).

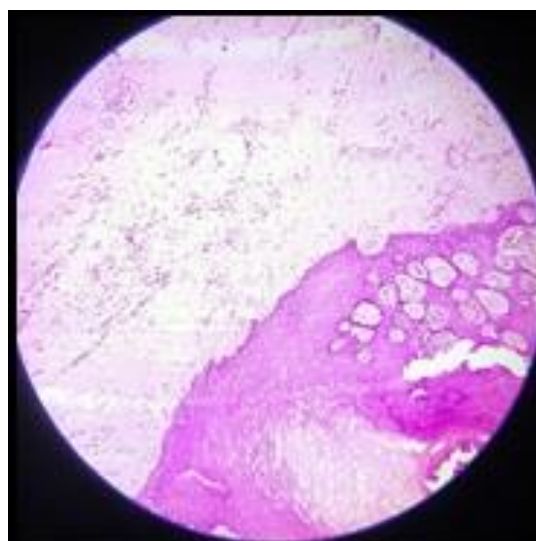


Figure 8: Histopathology: Gingival Hyperplasia.

Discussion

Fixed orthodontic treatment results in increased plaque accumulation due to intra-oral orthodontic appliances. As a result, periodic maintenance of periodontal health during orthodontic health is an essential requisite. Plaque control during orthodontic treatment must be stressed by the orthodontist in order to refrain such consequences [13]. In the present case report, a 24-year-old patient reported with a chief complaint of swelling in the gums in upper front region of the jaw in the last 2-3 months. Following the phase 1 therapy, gingivectomy was successfully carried out. As we know, gingivectomy is the treatment of choice for such overgrowths caused due to orthodontic treatment in order to create new physiological contour along with maintaining periodontal health [14-17]. The present case was treated with gingivectomy carried out by conventional surgical excision. Lasers, electrosurgery and chemosurgery are other options used to treat gingival overgrowths.

Following gingivectomy, gingivoplasty was carried out with help of diode laser to create acceptable physiological contour [18-22]. Laser is an acronym for 'light amplification by stimulated emission of radiation' [23]. Lasers can easily ablate and precisely reshape oral soft tissues providing haemostasis through heat induced coagulation and occlusion of arterioles, venules and capillaries, thus allowing a clear field throughout the procedure. Laser irradiation also provides significant bactericidal action and is an adjunct to traditional surgical and nonsurgical therapy [24-25]. Diode laser is a solid-state semi-conductor laser with combination of gallium, aluminium, arsenide and indium

that changes electrical energy to light energy. Owing to the 'hot-tip' effect of this laser gingivoplasty with diode laser was carried out after surgical excision in the present case, further declining chances of recurrence due to its inherent bactericidal effect.

Nevertheless, wavelength absorbed by pigmented chromophores, aids in a bactericidal effect on the tissue invasive periodontal pathogens [26]. Plaque is considered the primary etiological agent for initiation of periodontal diseases. The initial microbial challenge is followed by subsequent host inflammatory response, and along with various risk factors contribute to host susceptibility and progression of the disease, pocket formation and loss of clinical attachment levels. Therefore, stringent plaque control is must throughout the orthodontic treatment [27,28]. Clocheret et al 2003 did a case study in which idiopathic gingival hyperplasia induced by orthodontic treatment was treated with gingivectomy. The authors stressed on multiple periodontal examinations, regular plaque control measures during fixed orthodontic treatment so as to maintain healthy periodontium. On the other hand, gingival inflammation and overgrowth would hamper the tooth movement thereby prolonging the orthodontic treatment. Thus, maintenance of healthy periodontium during and post orthodontic treatment is must [29]. Uslu et al 2018 carried out a case study in which gingivectomy was considered as a treatment option for enhancing smile post orthodontic treatment. According to the authors, gingivectomy not only helps to recontour the margins of the gingiva but also aids in enhancing smile of an

individual [30]. Garcia huerta et al 2019 reported a clinical case of orthodontic treatment induced gingival hyperplasia, which they treated with surgical excision alone. Complete resolution of gingival hyperplasia was seen at 8 days with complete elimination of supra-osseous periodontal pockets.

The supplementation of gingiva-plasty with the conventional gingivectomy adds up to the betterment of the results. The results of this clinical case are in accordance with the present case [31]. Lione et al in 2020 carried out a comparative study and compared diode laser with conventional surgical excision to evaluate their effectiveness to treat gingival hyperplasia caused due to orthodontic treatment. The results of the present study showed predictable results in reducing gingival hyperplasia when compared with non-surgical periodontal therapy alone at a follow-up period of 1,3 and 6 months [32].

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Conclusion

In the present case, gingivectomy with surgical excision followed by gingivoplasty with diode laser was carried out for treating gingival overgrowth caused due to fixed orthodontic treatment. Gingivoplasty with diode laser was carried out not only to refine scalloping but also due to its other inherent properties like haemostatic action, precise excision, improved post-operative healing and bactericidal action which will further prevent recurrence. Further stringent plaque control measures are advised in patients undergoing orthodontic treatment. Lastly, longitudinal studies in patients undergoing orthodontic therapy will help elucidate the co-relation between orthodontic appliances and gingival enlargement.

Conflict of interest

There are no conflicts of interest.

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