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### Case Report

#### Severe Gingival Overgrowth associated with Palatal Crib Appliance: A Case Report

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#### ABSTRACT:

Gingival overgrowth can be defined as an abnormal excessive growth of gingival tissues. Patients undergoing orthodontic therapy most commonly witness gingival overgrowth due to difficult oral hygiene maintenance. A patient of a 28 yrs old male who was referred to the department of Periodontology with maxillary palatal gingival enlargement associated with palatal crib orthodontic therapy is being reported. To achieve satisfactory aesthetics, gingivectomy by ledge and wedge technique was opted as choice of treatment. Post operative examination revealed normal, clinically healthy gingiva.

**Key words:** Gingival Overgrowth, Palatal Crib.

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#### INTRODUCTION

Gingival tissues surrounding the teeth play a pivotal role in determining the anterior maxillary esthetics. Symmetry contour and form of gingival tissues have a significant impact on the emergence profile, leading to pleasing and balanced appearance of the natural or prosthetic dentition.<sup>1</sup> Nowadays, with increasing demand of patients for esthetically proportionate results, treatment plan is also designed accordingly. Healthy and inflammation-free periodontal tissues provide an ideal anterior appearance. Gingival overgrowth (GO) or Gingival enlargement (GE), both are the currently accepted terminology.<sup>2</sup> Gingival overgrowth is a heterogeneous group of disorders caused by increase in submucosal connective tissue and is characterized by progressive enlargement of the gingiva. The etiology and pathogenesis of gingival overgrowth is poorly understood and not well documented, however it could be directly attributed to the factors such as individual susceptibility, local factors (dental plaque, caries, orthodontic appliance and iatrogenic factors), systemic hormonal stimulation, blood dyscrasias, drugs and

idiopathic.<sup>3</sup> Sometimes etiology is clearly evident and therefore diagnosis and treatment plan can easily be established, but many a time underlying cause remains idiopathic and medical opinion is considered in such cases. It can be generalized or localized manifesting either as nodular or symmetric form. It is usually painless until enlargement is traumatized during occlusion hence leads to difficult mastication and speech, further adding in difficult oral hygiene maintenance by inappropriate plaque removal.<sup>4</sup> Gingival enlargement or hyperplasia associated with orthodontic treatment is one of the most common soft tissue problems associated with fixed orthodontic appliances. Performing proper oral hygiene measure becomes difficult in cases with fixed prosthesis and in patients with fixed orthodontic appliances hence acting as a retention areas for accumulation of debris and plaque. This further worsens the texture and consistency of the gingival tissues by inducing inflammatory changes which further progress as pseudo periodontal pocket with or without attachment loss.

Treatment of such cases concentrates primarily on patients motivation on oral hygiene maintenance. Non conventional treatment including scaling, root planing are effective but does not produce promising results when excessive enlargement cripples self care and maintenance. In such cases, surgical approach is considered , but effective results are seen if adequate oral hygiene is maintained.

Various gingivectomy techniques which can be performed include- gingivectomy by surgical, chemosurgery, laser, electrosurgery and cryosurgery.

The following case report presents a case of Grade 3 gingival overgrowth treated by Ledge wedge techniques .It is commonly indicated in palatal areas with thick mucosa where along with pocket dept reduction , thinning of flap is also required .

### CASE REPORT

A 28 year old male was referred to the of Department of Periodontology, BBDCODS, Lucknow, from the Department of Orthodontics and Dentofacial Orthopedics with the chief complaint of slowly growing gingival swelling since 20-25 days . All the significant drug and medical history was negative. Also familial and postnatal history was non-contributory. Intraoral examination revealed grade III gingival overgrowth which was smooth , sessile, reddish pink on the palatal aspect of maxillary anterior i.e. 11,12,21,22 region associated with the use of palatal crib appliance (fig 1). Bleeding on probing was present. Taking into consideration the clinical finding, a provisional diagnosis of inflammatory gingival enlargement was made. Treatment plan consisted of –

1. Removal of palatal crib appliance
2. Full mouth scaling
3. Gingivectomy

Firstly, palatal crib appliance was removed (fig 2) and scaling and root planing was performed. The patient was prescribed Chlorhexidine – M gel and the patient was recalled after a week. Even after the initial therapy the gingival enlargement persisted so gingivectomy was planned by the ledge and wedge technique with prior consent from the patient.



Fig 1- Pre Operative Picture Before Scaling and Root planning



Fig 2 –Removal of Palatal Crib Appliance

### Surgical treatment -

The primary incision is made perpendicular to the gingiva to strike the base of the soft tissue pockets. Secondary incisions are made lingually at 45° external bevel to remove the remaining soft tissue ledges (fig 3,4). Excised tissues were sent for histopathological examination. Thorough post operative instructions were given to the patient and analgesics (Ibuprofen 100mg TDS for 5 days) and antibiotics (Amoxicillin 500 mg TDS for 5 days ) were prescribed and patient was recalled after 7 days for follow up. On follow up, intra oral examination revealed normal, clinically healthy gingiva.



Fig 3- Gingivectomy by Ledge and Wedge Technique

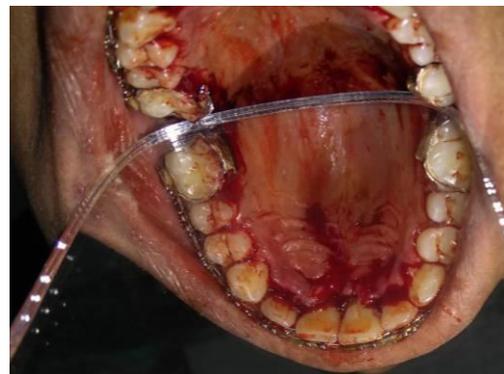


Fig 4- Immediate surgical Post Operative Picture

Histopathological examination revealed hyperparakeratinised stratified squamous epithelium with acanthosis. Both bulbous and elongated rete-ridges pattern are seen in different areas of epithelium. The underlying fibrous connective tissue shows bundles of collagen fibres, coursing in an irregular pattern. Areas of hemorrhage were seen. Mild chronic inflammatory cells predominantly of plasma cells and lymphocytes were seen suggesting - "Fibroepithelial Hyperplasia of Gingiva". Based upon the histopathological finding, a diagnosis of "Fibro epithelial hyperplasia" was made.

## DISCUSSION

Orthodontic treatment can be implemented to improve dental aesthetics not only by correcting position of the jaws and deformities of dentition, but also by creating the conditions for improved gingival health. Gingival overgrowth is a very common condition in patients undergoing orthodontic therapy, when involving the anterior region, which may have an impact on oral health-related quality of life.<sup>5</sup> Fibrous growths of the oral soft tissues are common and include a wide variety group of reactive and neoplastic conditions. Fibroepithelial hyperplasias are reactive/inflammatory condition which presents variety of lesions named according to their clinical presentation<sup>6</sup>. Gingival enlargement appears frequently in patients treated with fixed orthodontic appliances. Renkema, et al. (2010) reported that there was an increase in average degree of gingival enlargement during orthodontic treatment and decrease in the degree of gingival enlargement post appliance. But, within 3 months of debonding of orthodontic brackets, recurrence of gingival enlargement was noticed. Hence, it was concluded that gingival enlargement that occurs during treatment with orthodontic appliances was reversible.<sup>7</sup> Another study by Kouraki, et al. (2005) showed that complete resolution of gingival enlargement developed during orthodontic treatment is not always attained after removal of the orthodontic appliances.<sup>8</sup>

Recently, Surlin et al.<sup>9</sup> evaluated orthodontic patients with good dental hygiene exhibiting GO without any clinical signs of gingival inflammation. These patients exhibited elevated matrix metalloproteinase-8 (MMP-8) and matrix metalloproteinase-9 (MMP-9) levels in gingival crevicular fluid (GCF). It was considered that, during orthodontic treatment, the mechanical stress appeared to be one of the key factors determining the increase of MMP-9 production and the onset of GO.

There is a study which shows possible role of an allergic reaction to nickel, releasing from the orthodontic appliances made of stainless steel. The released nickel ions may cause an exposure time dependent allergic reaction characterized by an upregulated proliferation of keratinocytes and increased epithelial cell proliferation.<sup>8,9</sup> According to the Gingival inflammation (GI) severity, treatment strategies may vary. When GI is located in soft

tissues only, it may be treated using a cold blade or the electric cautery with no significant difference between the two gingivectomy techniques<sup>10</sup>. Soft tissue diode laser in the management of mucogingival problems may present some advantages because of the minimal postoperative pain reported with the use of these devices<sup>11</sup>.

In another study by Pant and Pandey 2015 Idiopathic gingival enlargement (GE) associated with chronic periodontitis comparing two surgical approaches, that is, scalpel (ledge and wedge technique) and electrosurgery. The massive GE subsided without recurrence and patient was completely satisfied with the treatment, though better compliance was observed at the site treated by conventional scalpel and blade technique.<sup>12</sup>

In the present study, the possible etiology would be extension of the reactive lesion through the interdental papilla to the palatal aspect. In this study, after the surgical excision, complete reduction in size of the lesion was seen.

## CONCLUSION

Orthodontic treatment leads to difficult oral hygiene maintenance and hence may accentuate gingival response. Gingival overgrowth is commonly seen as a sequel of orthodontic treatment. Non surgical therapy proves to be effective treatment for mild enlargements, but for moderate to severe enlargements surgical intervention is required. Ledge and wedge technique performed in this case produced esthetically and functionally acceptable results. Thus it is highly recommended to keep all the patients undergoing orthodontic treatment on strenuous oral hygiene regimen.

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