Case Report

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# Treatment of Fibrotic Gingival Enlargement an Obstacle During Orthodontic Space Closure: A Case Report

**Abstract:**

Gingival enlargement (GE) can arise due to gingival inflammation, fibrous overgrowth, or a combination of both, leading to challenges such as plaque control issues, difficulty in chewing and speaking, as well as esthetic and psychological concerns. One of the contributing factors to gingival hypertrophy is orthodontic treatment. A 14-year-old female patient visited the Department of Periodontics and Oral Implantology at K.D. Dental College and Hospital with a complaint of GE affecting her front teeth. She was undergoing orthodontic treatment to close spacing in the anterior region. The presence of GE was interfering with space closure. To address the condition, a gingivectomy was performed to excise the excess gingival tissue. The patient continued with her fixed orthodontic treatment, accompanied by monthly periodontal check-ups to manage gingival inflammation. Effective management of hyperplasia in orthodontic patients requires close collaboration between the periodontist and orthodontist to ensure optimal treatment outcomes.

**Key-words:** Gingival Overgrowths, gingivectomy, gingivoplasties,

## Introduction:

The visual appeal of the gingiva surrounding the anterior maxillary teeth plays a crucial role in dental aesthetics. The symmetry and contour of the gingival tissues significantly contribute to the overall harmony of both natural and prosthetic teeth. As patients increasingly seek more aesthetically pleasing results, their treatment decisions may be influenced by these considerations. Optimal anterior aesthetics are achieved when the periodontal tissues are healthy and free from inflammation [1]. Proper diagnosis of the underlying cause is essential for effective treatment and management. There may be a connection between fixed orthodontic appliances and persistent periodontal diseases. Gingival enlargement occurs due to increased plaque buildup and inadequate oral hygiene [2]. While this mechanism contributes to GE during orthodontic treatment, its precise nature remains unclear. The onset and progression of periodontal disease depend on the balance between microbial factors and the host's immune response. Individuals undergoing fixed orthodontic treatment for more than 12 months are at an increased risk of developing periodontal issues. One of the most common disadvantage of fixed orthodontic appliances is gingival hyperplasia or overgrowth. This condition is primarily linked to the release of nickel ions from orthodontic bands, which stimulate fibroblast proliferation, leading to gingival enlargement. Since orthodontic brackets contain nickel ions, their interaction with gingival tissues plays a crucial role in this process, contributing to excessive tissue growth. The treatment approach varies depending on the type of enlargement, often combining surgical and nonsurgical methods based on the

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patient's specific needs. Both functional and aesthetic considerations are essential, as the excessive gingival tissue can be unappealing. This necessitates a gingivectomy, a procedure to remove the overgrown gingiva. During a gingivectomy, the diseased soft tissue lining the periodontal pocket is excised. Various techniques, including scalpel, laser, electrosurgery, and chemosurgery, can be used to perform the procedure.

A case of gingival enlargement caused by orthodontic therapy affecting a 14-year-old female patient referred from the Department of Orthodontics and reported to the Department of Periodontics, K.D Dental College is described in the case report .The patient was undergoing fixed orthodontic treatment for closure of spacing and gave a history of swollen gums after the initiation of orthodontic treatment. On intra oral examination it was found that there was GE in the maxillary anterior region. As seen in Figure 1, there was significant inflammation at the interdental papilla and marginal gingiva and generalised bleeding on probing

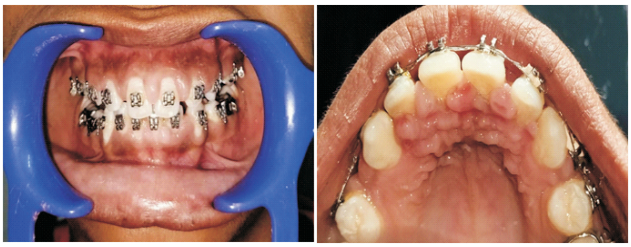

Fig:1 pre operative image of patient undergoing ortho treatment

The gingiva appeared generally consistent and firm, fibrotic though with some loss of contour and stippling. A pseudopocket measuring 4-5 mm was observed. Based on these findings, the patient was advised to undergo initial therapy, surgical intervention, and a haematological examination. As part of the initial treatment, scaling and polishing were performed, and the patient was scheduled for a follow-up after seven days. Haematological tests, including haemoglobin level, bleeding time, clotting time, were conducted, all of which were within normal limits. Under aseptic conditions and local anaesthesia, bleeding points were marked using a pocket marker.

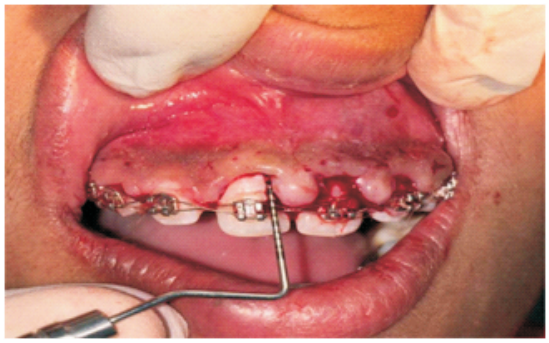

Fig:2 showing pseudopockets with probe

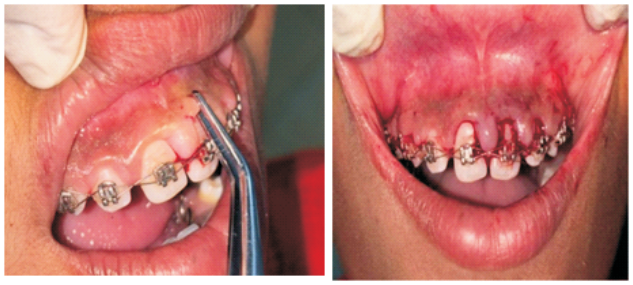

Fig: 3 Bleeding points mark till pocket depth using pocket marker

Seven days after completing the initial therapy, excess gingival tissue was excised using a scalpel through gingivectomy and gingivoplasty procedures. These scalpel-based techniques proved highly effective in managing gingival enlargement associated with orthodontic treatment, yielding optimal results.

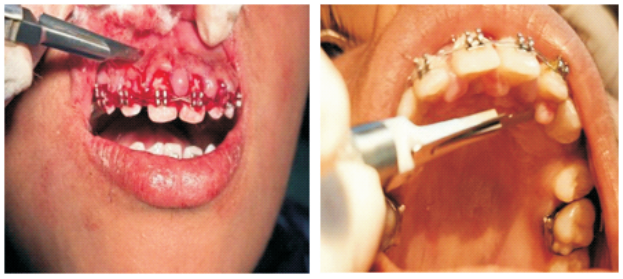

Fig:4 External bevel incision given using 15 no.blade

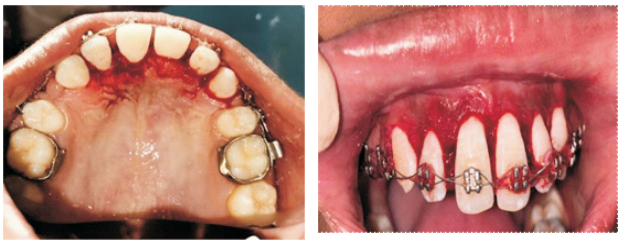

Fig:5 Gingivectomy and Gingivoplasty performed using convectional scalpel technique

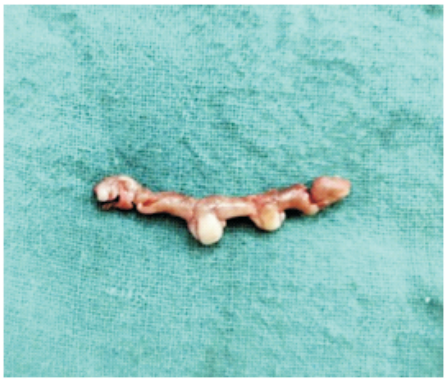

Fig:6 Exicised gingival growth

After procedure, the periopack (Coe-pack) was placed to assist healing by protecting the tissue,

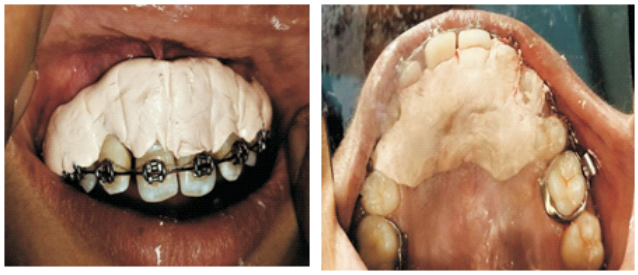

Fig:7 Periodontal pack is administered after the surgery.

The case report highlights significant gingival overgrowth, covering nearly half of the crown, leading to plaque retention and aesthetic concerns for the patient. Following the surgical procedure, the patient returned after seven days for periopack removal. The results demonstrated that achieving proper gingival contour effectively eliminates suprabony pockets, promotes satisfactory healing, and enhances overall aesthetics.Patient was recalled after 7 days for follow up and successful healing occurs among gingival contours

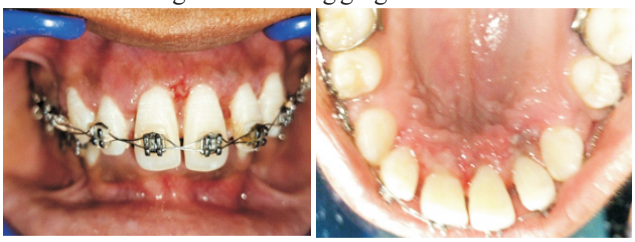

Fig: 8 Post-operative view after seven days reveals satisfactory healing, proper gingival contour and Improved aesthetics

Fifteen days after the procedure, the patient returned for a follow-up examination, which confirmed complete healing and a significant reduction in gingival inflammation. This case report illustrates that removing suprabony pockets through gingivectomy and gingivoplasty helps establish a natural gingival contour, enhances aesthetics, and prevents plaque accumulation as well as space closure.

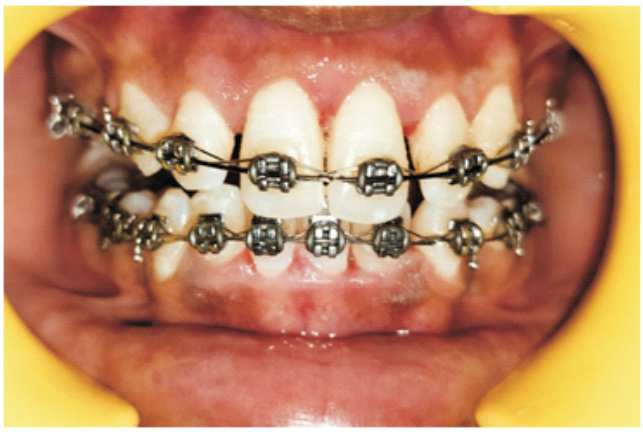

Fig:9 Post operative view Two weeks after surgical approach

The gingival overgrowth category in this case report is GE with fibrotic type. GE is marked overgrowth that describes by the presence of encroachment of the gingiva onto the clinical crown. Gingival overgrowth is associated with the use of orthodontic appliances during treatment. Some etiologic factors for GE caused by orthodontic treatment were discussed by Kloehn and Pfeifer[4] . Orthodontic therapy can contribute to an increased occurrence of gingival overgrowth due to various risk factors. These factors include inadequate plaque control, alterations in the microbiological environment, excessive or uncontrolled orthodontic forces, and adverse tissue responses during tooth movement. Additionally, mechanical irritation from orthodontic bands, chemical effects from excess bracket cement, and the presence of nickel in orthodontic appliances can further contribute to this condition. In this case, the patient exhibited gross gingivitis without any signs of periodontal bone loss. A comprehensive medical examination, including periodontal probing and radiographic evaluation, was conducted. Achieving adequate hemostasis was essential, as blood loss could hinder tissue removal and impair visibility. Orthodontic treatment requires regular monitoring to ensure controlled tooth movement. When patients fail to attend scheduled orthodontic visits, the forces exerted by orthodontic appliances can become uncontrolled, potentially leading to unfavorable tissue reactions. The mechanical impact of orthodontic bands and the chemical influence of excess bracket cement can contribute to oral health issues. Research by Zanatta et al. highlights that excess resin around orthodontic brackets can lead to gingival overgrowth, particularly in the anterior region[9] . This occurs because the excess resin acts as a retention site for plaque and debris, fostering a bacterial-friendly environment. Another contributing factor to gingival overgrowth is the continuous release of nickel from orthodontic appliances. Most orthodontic devices utilize nickel-titanium (NiTi) alloys, which release low doses of nickel into the oral environment. Gingival overgrowth during orthodontic treatment can be managed through both non-surgical and surgical approaches:

- **Non-Surgical Treatment:**

Includes oral hygiene instructions, motivation, scaling, root planing, and oral prophylaxis. Proper oral hygiene education and motivation play a crucial role in reducing disease severity and improving overall oral health.

- **Surgical Treatment:**

Considered in cases where non-surgical methods are insufficient to manage excessive gingival enlargement.

Evidence suggests that increased oral hygiene awareness significantly reduces plaque retention, thereby improving gingival health throughout orthodontic treatment. Therefore, maintaining proper oral hygiene is essential in minimizing

adverse tissue reactions associated with orthodontic appliances. In this case after one week of non-surgical treatment, the examination revealed that the gingival overgrowth remained persistent that hampers space closure during treatment These findings align with previous research indicating that complete resolution of orthodontic treatment-induced gingival overgrowth is not always achieved solely through temporary removal of orthodontic appliances, scaling and root planing, or enhanced oral hygiene. This is primarily due to fibrotic changes within the gingival connective tissue. While non-surgical periodontal therapy can effectively reduce inflamed gingival overgrowth, cases involving fibrotic changes cannot be resolved merely by eliminating irritants such as bacterial plaque, archwires, or brackets. When gingival overgrowth does not improve following non-surgical treatment, surgical intervention becomes necessary.

In such instances, surgical options include gingivectomy and gingivoplasty. In this case, both procedures were performed using a conventional scalpel technique, which effectively reduced the gingival overgrowth.At the two-week postoperative follow-up, complete healing of the gingival surface was observed.. The patient was then referred back to the orthodontist to resume her orthodontic treatment, along with recommendations to minimize the risk of recurrence and other potential effects of fixed orthodontic appliances on periodontal tissues. These recommendations included:

1. Educating and motivating the patient on the importance of maintaining proper oral hygiene.
2. Ensuring that the orthodontic appliance applies tissue-adaptable pressure.
3. Encouraging regular follow-up visits to monitor and adjust the appliance pressure as needed for optimal periodontal health.

## Conclusion:

Orthodontic treatment can continue effectively three months after surgery. Providing clear instructions and motivating patients to maintain good oral hygiene are essential in preventing recurrence. Additionally, collaboration between orthodontists and periodontists plays a crucial role in achieving optimal treatment outcomes. This case report highlights that surgical periodontal treatment using scalpel gingivectomy is an effective approach for managing gingival health issues in patients with fixed orthodontic appliances. By removing suprabony pockets through gingivectomy and gingivoplasty, a natural gingival contour is restored, plaque accumulation is minimized, and the patient's aesthetics are enhanced. Regular periodontal maintenance during orthodontic treatment is essential to prevent such issues and maintain healthy gums.

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