

Conventional gingivectomy for chronic gingival enlargement in orthodontic treatment: a case report

Irma Dewi Ratnawati*, Rosa Pratiwi*

* Faculty of dentistry, Department Periodontology, Universitas Islam Sultan Agung

Correspondence: irmadr@unissula.ac.id

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ABSTRACT

Background: Gingival enlargement, also known as gingival overgrowth, is an enlargement of the gum tissue. There are many possible causes for enlarged gums. Gingival enlargement is general feature of gingival diseases. It is common note to chronic inflammatory gingival enlargement was caused by poor of oral hygiene. Orthodontic braces can interfere with good oral hygiene, contributing to the development of the inflammatory process. One of the most common soft tissue problems related to fixed orthodontic appliances is gingival hypertrophy or hyperplasia. Maintaining oral hygiene is hindered in cases of gingival hypertrophy due to orthodontic appliances. The most widely used surgical method to treat gingival hypertrophy is gingivectomy.

Case: A 27-year-old patient was referred to the periodontal clinic of Airlangga University Dental Hospital because of primary gingival swelling with gingival bleeding during brushing in the anterior mandibular region. On intra oral examination showed excessive gingival with probing depth was range 4 mm on teeth 42-32, revealing the presence of pseudopockets. Clinical examination revealed generalized gingival enlargement as well as generalized bleeding on examination. After explaining the condition and treatment to the patient, he was registered for phase I treatment. After evaluating phase I therapies, phase II treatment with gingivectomy and gingivoplasty were required using a scalpel.

Conclusion: Conventional gingivectomy gives satisfactory result in treating the inflammatory gingival enlargement.

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INTRODUCTION

The term "gingival enlargement," which is used internationally to describe the enlargement of the gum tissue, is a common sign of gingival disease. It is a multifactorial condition that arises as a result of interactions between the host and environment as well as a number of different stimuli. In clinical practice, gingival enlargement is a frequent observation, and effective treatment depends on a precise diagnosis of the underlying reason ^{1,2}.

The most prevalent type of enlargement results from plaque-induced inflammation of the surrounding gingival tissue (inflammatory hyperplasia), which is most frequently linked to interdental papillae. This condition can be localized or generalized, and can range from mild interdental papillae enlargement to segmental or uniform, severe enlargement that affects one or both jaws ^{1,2,3}. Acute or chronic alterations in enlarged gingivitis are possible, although chronic changes are far more likely. Plaque-induced Plaque and calculus should be removed, dental hygiene should be improved, and treating inflammatory hyperplasia is important if the gingival tissue is swollen. Some patients with swollen gums find it difficult to conduct oral care tasks, and having fixed dentures or orthodontic appliances might make matters worse ^{1,2}.

After teeth grow, attaching braces is considered to be the second moment that changes the environment in the mouth. It causes qualitative and quantitative changes in the oral microflora, which can lead to an increase in the number of microorganisms not only in saliva, but also in dental plaque. Orthodontic appliances can interfere with good oral hygiene and contribute to the development of the inflammatory processes. One of the most common soft tissue problems associated with fixed orthodontic appliances is gingival

hypertrophy or hyperplasia. Orthodontic appliances cause enlarged gums, which compromises maintaining oral hygiene. It also affects biting, chewing, speaking, which can lead to aesthetic and psychological problems in most cases. It has been reported that it may interfere with tooth movement due to orthodontics ^{4,5}.

The first line of treatment in the treatment of gingival enlargement is to motivate the patient to maintain oral hygiene with additional use of mouthwash. This depends on patient compliance, but some patients may have poor compliance and limited efficacy. Non-surgical periodontal treatments (such as oral hygiene instruction, scaling, root planing, and prophylaxis) are a conventional methods manage gingival enlargement, but if gingival enlargement becomes widespread and personal hygiene is compromised, it is not necessarily valid if there is ⁵. Excision or removal of the gingiva tissue with the goal of removing the pocket wall is known as a gingivectomy. In general, gingivectomy improves the visibility and accessibility of the calculus, makes it easier to smooth the root surface, fosters the healing process of the gingiva, and restores the physiologic shape of the gingiva ⁶. Reshaping was used as part of the gingivoplasty procedure to remove periodontal pockets. In order to reconfigure the gingiva without pockets, gingivoplasti involves reshaping the gingiva to provide a physiologic gingival contour. The aesthetics of the gingiva can be enhanced with gingivoplasty ⁷.

CASE REPORT

A 27-year-old male patient was referred from Airlangga University Orthodontics Clinic Dental Hospital to Airlangga University Periodontics Clinic Dental Hospital with the chief complaint of swollen gums with bleeding during tooth brushing in mandibular anterior region. On intra oral

examination showed excessive gingival with probing depth was range 4 mm on teeth 42-32 (FDI notation), revealing the presence of pseudopockets. Local factors such as plaque and calculus were present on all teeth. No medication

history or general medical history was reported. Additionally, there was no family history. Clinical examination revealed Grade II gingival enlargement in mandibular anterior. (Figure 1)



Figure 1. Swelling gingiva

CASE

Initial treatment consisted of full mouth scaling and root planning using ultrasound instruments and oral hygiene instruction. Even after the first treatment, the gingival enlargement remained. After phase I treatment, the patient was recalled. Written consent was obtained before the surgical procedure. The decision to treat with gingivectomy is based on the amount of tissue present after phase 1 treatment.

Preoperative asepsis with povidine iodine was performed to maintain sterility throughout the surgical procedure. Local anesthesia (2% lidocaine with 1: 80,000 epinephrine) was administered. A pocket marker was used to puncture the gingival to create bleeding points. Gingivectomy using conventional method was performed. Incision discontinuously with blade no. 15c angled 45° 1 mm

more apical from bleeding points. Sickle was used to remove incised tissue. Kirkland knife was used to reshape and contour gingiva. Orban knife used to release interdental tissue. This gingivectomy procedure took approximately 45 minutes.

The area of treatment was covered with periodontal dressing (Coe-pak®) for 7 days to reduce the discomfort of the patient while having meal and beverages. Besides, it can minimize bleeding. Postoperative instructions were given. Patient was prescribed chlorhexidine mouthwash twice daily for 7 days and 500 mefenamic acid for 7 days as an analgesic. Patient was evaluated 1 week post operative. One week post operative showed satisfactory healing. The periodontal pack was still there. There was minimal bleeding and inflammation of the gingiva.

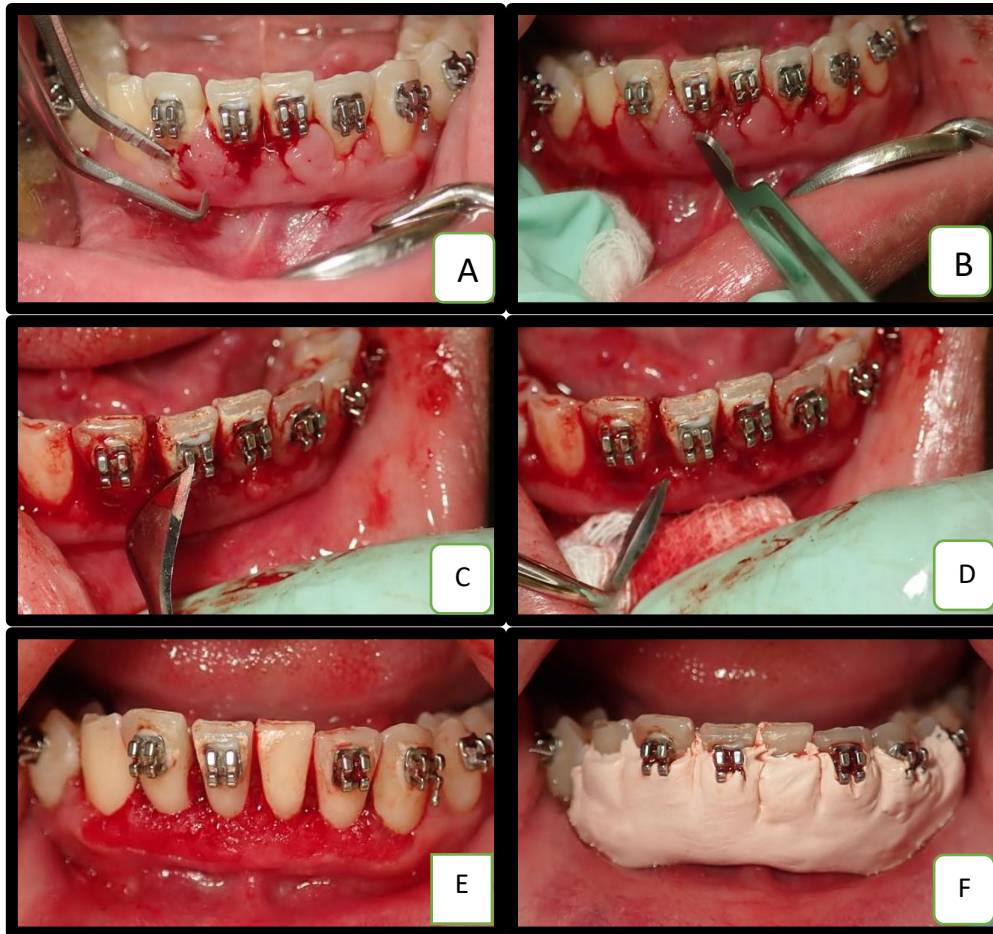


Figure 2. Scalpel surgical gingivectomy and gingivoplasty procedures: (A) Bleeding point that was puncture by pocket marker, (B) Incision discontinuously angle 45° with blade no.15c 1 mm more apical from bleeding points, (C) Kirkland knife was used to reshape and contour gingiva, (D) Orban knife was used to release interdental tissue, (E) Post-operative condition, (F) Bleeding control using periodontal dressing (Coe-pak[®])

One week post-operative showed satisfactory healing. The periodontal pack was still there. There was minimum bleeding and

inflammation of the gingiva. Patient was happy and satisfied with the outcome of the therapy.

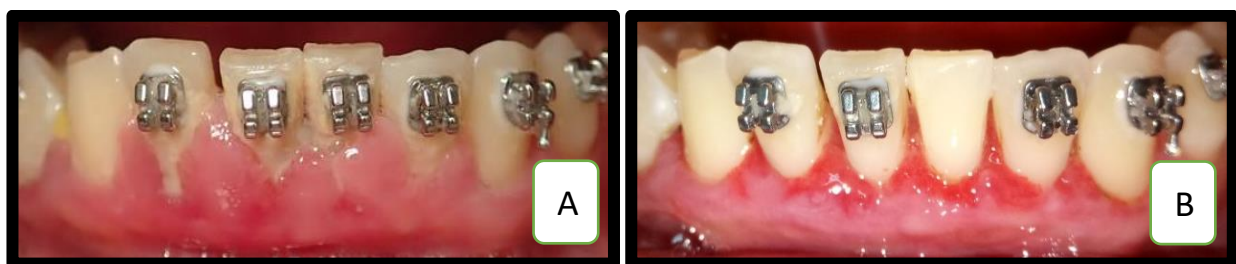


Figure 3. One week post scalpel surgical gingivectomy and gingivoplasty on mandibular anterior: (A) before scalpel surgical gingivectomy and gingivoplasty, (B) after condition scalpel surgical gingivectomy and gingivoplasty

DISCUSSION

Poor oral hygiene leads to plaque buildup and causes periodontal problems and tooth decay. Factors that promote plaque buildup and retention include poor oral hygiene, abnormal relationships between adjacent and opposing teeth, lack of tooth function, inappropriate restorations, orthodontic treatment and habits. Many studies have shown that orthodontic braces increase plaque accumulation, which was also proven in this study. Fixed orthodontic appliances and poor oral hygiene habits of the patient can affect the results of orthodontic treatment. Factors that may affect compliance include: patient characteristics, duration and complexity of treatment, dentist-patient relationship, and educational and behavioral interventions used. Orthodontists frequently encounter treatment-related soft tissue problems. The most common problems include gum overgrowth and asymmetry, which can turn even a well-treated case into an aesthetically unsatisfactory one^{4,8,9}.

The soft tissue covering the alveolar bone and the tooth's root up to the cemento-enamel junction is called gingiva. It serves as a line of defense against microbiological and mechanical harm. The gingival disease is the most prevalent condition in periodontal tissue¹⁰. Enlarged gums are a common feature of gingival disease and can be caused by fibrous overgrowth, gingivitis, or a combination of both. Chronic hypertrophic gingivitis is often associated with long-term accumulation of bacterial plaque. Regular oral prophylaxis by a professional and proper patient compliance are essential when dealing with such cases. When chronic hypertrophic gingivitis with a pronounced fibrous component does not completely disappear after initial periodontal treatment or does not meet the patient's esthetic requirements, surgical removal is the only treatment option. The most

common surgical method to treat gingival enlargement is gingivectomy^{1,2,11}. Gingivectomy and gingivoplasty help eliminate gum overgrowth, provide a harmonious gum line, and also facilitate the maintenance of good oral hygiene. Avoiding this can lead to plaque buildup, which can worsen gum overgrowth and lead to periodontal destruction¹².

For many years, scalpels have been used for gingivectomy. This procedure uses small surgical blades and other periodontal surgical instruments to cut tissue and move the gum line into the ideal position. This scalpel is easy to use and offers the advantages of precise cutting with well-defined edges, rapid wound healing, no damage to adjacent tissue and helped reducing the duration of the procedure. However, scalpel wound resulted in unpleasant bleeding with poor visualization of the operative area^{13,14,15}.

Research on periodontal tissue healing following surgery has been ongoing for a while. The typical form of gingivectomy results in a wound that heals more quickly, without scarring or constriction. On the seventh day of the healing phase, the histological investigation revealed a dense inflammatory infiltration, a dense fibrous connective tissue stroma, and a modest amount of fibers^{16,17,18}. Scalpel incisions were found by histological tests to be comparable to or superior to laser repair. In comparison to incisions created with diode lasers or electrocautery, it caused the least tissue damage and healed more quickly. Damage caused by lateral heat may be to blame for slow recovery. A region of coagulation necrosis known as "lateral heat damage" develops surrounding the incision line and results in necrotic cells. Decreased lateral heat production will improve healing^{19,20}.

In the case presented here, the aesthetic correction of chronic gingival enlargement treated by scalpel surgical gingivectomy and gingivoplasty

considered as successful treatment. One week post-operative showed minimal inflammation, such as redness, pain and bleeding.

CONCLUSION

Conventional gingivectomy and gingivoplasty gives satisfactory result in treating the inflammatory gingival enlargement. These methods need more effort to encourage patient about the better result which is can reduce discomfort during the procedure and post-operative.

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