



(CASE REPORT)



A Case Report: Management of severe gingival enlargement in uncontrolled patients with orthodontic treatment

Lubna and Agung Krismariono *

Departement of Periodontology, Faculty of Dentistry, Universitas Airlangga, Surabaya, Indonesia.

World Journal of Advanced Research and Reviews, 2022, 14(03), 223–227

Publication history: Received on 01 May 2022; revised on 04 June 2022; accepted on 06 June 2022

Article DOI: <https://doi.org/10.30574/wjarr.2022.14.3.0521>

Abstract

Gingival enlargement is a quite common orthodontic side effect. Gingival enlargement can be caused by chronic or acute inflammatory responses, with chronic alterations being more common. One of the most common soft tissue factors associated with fixed orthodontic appliances is gingival overgrowth or hyperplasia. A 10% reported incidence has been reported. Gingival enlargement caused by orthodontic treatment makes it difficult to maintain adequate dental hygiene. Patient motivation to maintain oral hygiene, combined with the use of mouth rinses, is the first line of treatment for gingival enlargement. Another treatment of gingival enlargement is gingivectomy. Gingivectomy is a surgical procedure through the excision of pathologically enlarged gingival tissue, which aims to eliminate pockets and gingival inflammation so that physiological, functional and aesthetic gingival tissue is obtained. In this Case report 35 years-old patient came to the dental periodontics specialist clinic, Faculty of Dentistry, Airlangga University for gingivectomy treatment. Gingivectomy used blade to eliminate multiple gingival enlargement at anterior regio. The bleeding point was determined by measuring gingival enlargement with a pocket marking forceps. The difference between pre and post therapy was compared in the final evaluation. As a result, it highlights the essential role of supporting periodontal therapy in keeping good and stable outcomes over a one-month follow-up period.

Keywords: Gingival enlargement; Chronic inflammatory; Orthodontic appliance; Gingivectomy therapy

1. Introduction

Gingival enlargement is a typical condition induced by gingival inflammation [1,2,3]. Mastication, language, aesthetic, and physiological issues can all be increased by this enlargement. The most common gingival enlargement can occur due to a plaque-induced inflammatory reaction where it can occur locally or spread throughout the tooth with multifactorial causes including interactions between the host and the environment and its response to stimuli [2,3]. Chronic or acute inflammatory responses might trigger gingival enlargement, while chronic changes are far more common[4].

However, inflammatory enlargements are sometimes a consequence of any of the other types of gingival enlargements, resulting in a combined gingival enlargement. In these conditions, it's essential to consider the dual etiology and help solve both causes[5]. Low-grade trauma, iatrogenic causes, drug-induced stimulation, underlying systemic disease, tooth plaque, hormone linked, vitamin C insufficiency, inherited, and idiopathic are all possibilities for etiopathogenesis [6]. Gingival enlargement or hyperplasia is one of the most prevalent soft tissue problems connected with fixed orthodontic appliances. A 10% prevalence rate has been reported. Gingival enlargement is formed by orthodontic treatment, and it has a substantial impact on oral care. It also has an impact on occlusion, mastication, and phonetics, and in the majority of cases, it can cause cosmetic and psychological problems, as well as risk orthodontic tooth movement. [7,8]. The first line of treatment for gingival enlargement is patient motivation to maintain oral hygiene, as

* Corresponding author: Agung Krismariono

Departemen of Periodontics, Faculty of Dentistry Universitas Airlangga, Surabaya, Indonesia.

well as the use of mouth rinses. This is critical for patient compliance, which in certain cases is insufficient and results in limited success [7,9].

Gingivectomy is a surgical procedure through the excision of pathologically enlarged gingival tissue, which aims to eliminate pockets and gingival inflammation so that physiological, functional and aesthetic gingival tissue is obtained[10,11]. A scalpel (scalpel), electrosurgery (cautery), laser, or chemosurgery can all be used to perform a gingivectomy. A scalpel is used to complete conventional gingivectomy, which is the most common method. The advantages of performing a gingivectomy with a scalpel include the relatively simple technique, the incision can be made with precision on the marginal gingiva that has been determined, the healing is relatively good and fast. However, there are drawbacks to this technique, including the possibility of bleeding that occurs during the surgical procedure so that it interferes with the operator's view. In addition, the presence of pain that occurs after surgery and the possibility of a prolonged healing process are also factors that need to be considered [10,12,13].

2. Case Report

The patient came with the complaint that almost all of his gums had grown to cover half of his teeth since two years ago with the last history of controlling orthodontic treatment 2 years ago. The patient has been examined by an orthodontic doctor and directed to do gingival surgery because it will hinder the orthodontist treatment carried out. The patient has done preliminary treatment in the form of scaling and root planing 1 month ago. Patients admitted to brushing their teeth 2x a day in the morning and at night before going to bed. The patient claimed not to smoke, and did not have a history of systemic diseases such as hypertension, diabetes and drug/food allergies. Extra oral clinical examination found no abnormalities and in the intra-oral clinical examination of the patient there are plaques on the entire regio of the upper jaw and lower jaw and as well as BOP (+) in the anterior regio of the teeth of the upper jaw and lower jaw.

Clinical examination showed gingiva enlargement 16 15 13 12 11 21 22 23 25 26 34 33 32 31 41 42 43 44, bleeding on probing and inflammation 17 16 15 25 26 27 44 43 42 32 33 34, calculus and plaque of maxillary and mandibular teeth. The diagnosed was chronic marginal gingivitis 15,16, 17, 25, 26, 27, 32, 33, 34, 42, 43,43. The etiology was identified to be dental plaque, and the prognosis was good. Scaling and root planing as a non-surgical therapy are included in the treatment plan. Gingivectomy on the maxillary and mandibular areas was proposed during the surgical phase. Maintenance and observation were suggested every four months for regulary check.



Figure 1 Initial Condition Before Gingivectomy Surgery (a-c)

3. Case Management

Initial treatment of scaling root planning and dental health education prior to surgery phase was done. Gingivectomy performed one week after initial treatment and performed if there is no inflammation. Treatment begins after a vital sign check and filling in the inform consent. Gingivectomy procedure begins by performing a work area asepsis action with providon iodine. The act of anaesthetic begins with topical anaesthetic application, then labial infiltration anaesthetion at the boundary of the tooth's motionless moving mucosa 12-11 and 21-22 with the cytojet. Inserting a pointed end parallel to the tooth axis into the pocket with pocket marking forceps creates bleeding spots. Pocket marking is done after touching the bottom of the pocket to generate bleeding points as projections from the base of the pocket. The external bevel incision of the bevel uses blade scalpel no.15c at a position of 1-2 mm apical from the bleeding point forming an angle of 45 degrees towards the coronal to form a zero pocket. Incisi in marginal areas is carried out discontinued and continued with incisi interdental areas using orban knives. Gingival tissue that has been cut off is released with a gracey curette. Gingivoplasty is performed to smooth, thin, and obtain physiological contours of gingiva with blade no.15c or Kirkland knives, then continued irrigation with saline solution. Application of periodontal dressing

to keep post-gingivectomy sores from irritation. Patients are then given 500 mg of amoxicillin every 8 hours for 5 days and 500 mg of mefenamic acid if needed, and chlorhexidin mouthwash 0.12% (Minosep 0,12%).

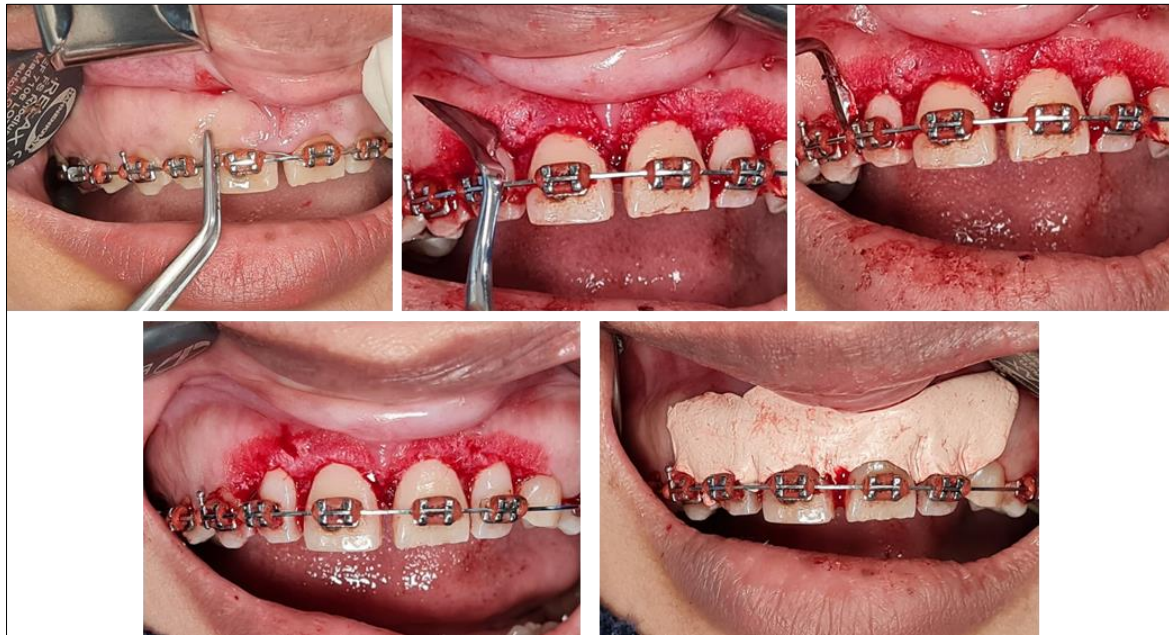


Figure 2 Gingivectomy Procedure: (A) pocket marked with pocket marker, (B-C) internal bevel incision 1-2mm at apikal bleeding point followed by gingivoplasty using Kirkland Knives and Orband on interdental. (D-E) Results right after gingivectomy (left). Application of periodontal packs in the operating area (right).



Figure 3 Final condition of the 14th days postoperatively, bleeding visible, normal gum color (left). Control condition II day 30 days postoperatively, normal gum color

4. Discussion

Gingival enlargement or overgrowth occurs in a variety of ways³. Gingival enlargement can be localized or general. Hypertrophy (an increase in cell size) and hyperplasion (an increase in the number of cells) cause gingival enlargement [10]. Mostly caused by inflammation due to plaque. Plaque stimulates the stay for a longer time, leading chronic inflammation and the proliferation of fibrous connective tissue [3,14,15]. Plaques and bacteria that accumulate for long time lead to infectious infiltration of the cell. This condition can be controlled with conventional first-line treatments such as scaling and root planning [3,16]. Periodontal surgical treatment, which includes gingivectomy, flap method with laser, and electrocauter, is used when gingival enlargement persist beyond conventional treatment. Gingivectomy is performed in this condition [3,15,16].

In this case gingival hyperplasion occurs because on clinical examination found tissue in gingiva dense and full, gingival stippling is more visible, not bleeding easily, paler color unlike in cases of hypertrophy where gingival color is redder

[17]. Orthodontic treatment induces gingival inflammation in the margins, which leads to hypertrophy gingival margins [7].

The use of orthodontic appliance is also one of the local factors of gingival enlargement. There is a positive relationship between the length of use of orthodontic appliance and the rate of gingival enlargement events [18]. Placement of orthodontic appliance will facilitate the accumulation of biofilms and colonization of bacteria that will trigger inflammation. With gingival enlargement, it will complicate access to the tooth surface and complicate self cleansing which results in increased plaque buildup [18,19]. This is the beginning of gingival enlargement, but after scaling and root planning gingiva patients do not show a decrease from the size of the gingiva the possibility of calculus that is still left behind in the subgingiva but not affordable tools because of the difficulty of accessibility and visibility so that gingivectomy and gingivoplasty surgery is needed [18,20,21,22].

In this case, the gingivectomy is performed using conventional scalpel procedures. The advantage of employing conventional method is that they are very inexpensive and simple to implement. In conventional gingivectomy techniques, epithelial regeneration is easier to achieve. Gingivectomy with lasers, electro cauters, or acidic materials causes necrosis, which is not seen in conventional gingivectomy methods [10,23].

Conventional gingivectomy is performed by removing the lateral wall of the pocket. This aims to eliminate pocket and inflammation of gingiva so that gingival tissue is obtained that is physiological, functional and aesthetically good. This procedure also aims to optimize the field of view on the entire surface of the tooth crown so that it is easier to remove the deposits found on the surface of the gingiva. Another important reason is that the elimination of this pocket aims to make the depth of gingival sulcus become normal again so that the maintenance of daily health and oral hygiene can be done[10]. Gingival surgery performed by incision, External bevel, is commonly used for the elimination of gingival enlargement which only includes free gingiva [10,23]. The disadvantage of this technique is that at the end of the gingivectomy, an open wound arises on the surface of the gingiva. Therefore periodontal pack should be applied to minimize bacterial contamination and minimize the occurrence of bleeding after gingivectomy [10].

In this case gingival enlargement as the main complaint of patient occurs due to the buildup of plaque that is aggravated by the orthodontic appliance so as to trigger the occurrence of inflammatory tensions. Suspected irritation of the surgical area due to poor oral hygiene of the patient. Saline irrigation is performed to reduce irritation and remove debris in the wound area. At 14th day control, the wound seemed to improve, the gingival color returned to normal, the bleeding did not exist. At 30th day control, the gum was healthy. The next plan of action is to send the patient for orthodontic treatment but the patient refuses for some reason.

5. Conclusion

Patients with orthodontic treatment may develop gingival enlargement due to plaque buildup on brackets used for orthodontic treatment. Gingivectomy and Gingivoplasty is a periodontal surgical procedure which aims to eliminate pockets and gingival enlargement so that the gingiva is obtained good physiological, functional and aesthetic.

Compliance with ethical standards

Acknowledgments

The authors thank the reviewers for their insightful suggestions.

Disclosure of conflict of interest

No conflict of interest.

Statement of informed consent

Informed consent was obtained from all individu participants included in the study.

References

- [1] Carranza FA, Hogan EL. Gingival enlargement. In: Newman MG, Takei HH, Klokkevold PR, Carranza FA. Carranza's Clinical Periodontology. 11th ed. Philadelphia: W.B. Saunders Company. 2006; 373-390.

- [2] Kurnia S. The aesthetic management of gingival enlargement and hyperpigmentation in maxillary anterior region: a case report. *Journal of Case Reports in Dental Medicine*. 2019; 1(1): 1-4.
- [3] Jadhav T, Bhat KM, Bhat GS, Varghese JM. Chronic inflammatory gingival enlargement associated with orthodontic therapy—a case report. *American Dental Hygienists' Association*. 2013 Feb 1;87(1):19-23.
- [4] Newman MG, Takei H, Klokkevold PR, Carranza FA. *Carranza's clinical periodontology*. 12th ed. Elsevier. Saunders. St. Louis, Missouri. 2015; 599-610: 576-580.
- [5] Sulastrianah, Oktawati S. Gingival overgrowth following mechanical trauma during tooth preparation: a case report. *Journal of Dentomaxillofacial Science*. 2019; 4(2): 114-116.
- [6] Prabhu M, Ramesh A, Thomas B. Treatment of orthodontically induced gingival hyperplasia by diode laser-case report. *Journal of Health and Allied Sciences NU*. 2015 Jun;5(02):066-8.
- [7] Sinclair PM, Berry CW, Bennett CL, Israelson H. Changes in gingiva and gingival flora with bonding and banding. *Angle Orthod*. 1987; 57: 271–278.
- [8] Kravitz ND, Kusnoto B. Soft-tissue lasers in orthodontics: an overview. *Am J Orthod Dentofacial Orthop*. 2008; 133: S110–S114.
- [9] Krismariono A, *Tatalaksana Pembesaran Gingiva Dengan Gingivektomi Konvensional*. In: *Proceeding The 3rd Periodontic Seminar (Perios3)*. Fakultas Kedokteran Gigi Universitas Airlangga, Bumi Hotel Surabaya, Pp. 2017 . 1-6. ISBN 978-602-73529-0-9
- [10] Widagdo AK, Murdiastuti K. Gingivektomi Menggunakan Scalpel dan Electrocautery pada Perawatan Gingival Enlargement Wanita Pubertas. *MKGK (Majalah Kedokteran Gigi Klinik)(Clinical Dental Journal) UGM*. 2015;1(1):1-4.
- [11] Funde S, Baburaj MD, Pimpale SK. Comparison between laser, electrocautery and scalpel in the treatment of drug-induced gingival overgrowth: a case report. *IJSS Case Reports & Reviews*. 2015; 1(10): 27-29.
- [12] Oncu E, Erbeyoglu AA, Alan R. Comparison of gingivectomy procedures for patient satisfaction: Conventional and diode laser surgery. *Selcuk Dent J*. 2017; 7(4): 6-9.
- [13] Tiwana PS, Kok IJ, Stoker DS, et al. Facial distortion secondary to idiopathic gingival hyperplasia: surgical management and oral reconstruction with endosseous implants. *Oral Surg Oral Med Oral Pathol Oral Radiol Endod*. 2005; 100: 153-157.
- [14] Agrawal N, Agrawal K, Mhaske S. An uncommon presentation of an inflammatory gingival enlargement responding to non-surgical periodontal therapy. *Int J Dent Hyg*. 2011; 9: 303-307.
- [15] Buddiga V, Ramagoni NK, Mahantesh H. Gingival enlargement - a case series. *Ann Essence Dent*. 2012; 1: 73-76.
- [16] Ismullah, Yenny, And Agung Krismariono Rule Of Gingivectomy In Orthodontic Treatment. Case Report. In: *Proceeding The 4th Periodontic Seminar (Perios4)*. Fakultas Kedokteran Gigi Universitas Airlangga, Bumi Hotel Surabaya, Pp. 2019. 115-118. ISBN 978-602-73529-2-6
- [17] Ramadhany, E. P. Gingivektomi Sebagai Tatalaksana Gingival Enlargement Pada Pasien Perawatan Orthodontik Cekat. *Interdental: Jurnal Kedokteran Gigi*, 2019, 15(2). <https://doi.org/10.46862/Interdental.V15i2.597>
- [18] Pinto AS, Alves LS, Zenker JE, Zanatta FB, Maltz M. Gingival enlargement in orthodontic patients: effect of treatment duration. *AJO-DO*. 2017; 152(4): 477-482.
- [19] Dr.J.Kavitha, Dr.S.Senthilkumar, Dr.Sijijacob, Dr.S.Lakshmisree, Dr.S.Srinivasan, Generalised Gingival Enlargement– A Case Report, *International Journal Of Scientific Research* . 2018. Volume-7 Issue-10
- [20] Andriani I. Treatment Gingival Enlargement by Gingivectomy, *Mutiara Medika*. 2009; 9(1): 69-73.
- [21] Soeprapto A. *Buku Pedoman dan Tatalaksana Praktik Kedokteran Gigi*, STPI Bina Insan Mulia, hal. 2017; 145-185.
- [22] Jha N, Ryu JJ, Wahab R, Al-Khedhairi AA, Choi EH, Kaushik NK. Treatment of oral hyperpigmentation and gummy smile using lasers and role of plasma as a novel treatment technique in dentistry: An introductory review. *Oncotarget*. 2017; 8(12): 20496–20509.
- [23] Nugala B, Kumar BBS, Sahitya S, Krishna PM. Biologic width and its importance in periodontal and restorative dentistry. *J Conserv Dent*. 2012; 15(1): 12–17.