

Gingivectomy and Gingivoplasty as Treatment for Altered Passive Eruption: A Case Report

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ABSTRACT

Background: Altered passive eruption (APE) is a developmental disorder that occurs when the gingival does not move apically as the tooth erupts. APE is a condition that can be corrected through a surgical procedure known as crown lengthening with gingivectomy.

Case: A 21-year old patient presented at Unimus Dental Hospital with one the upper front tooth appearing shorter. The gingival margin of tooth 12 appeared more convex and asymmetrical compared to tooth 22. Additionally, the gingiva of tooth 12 exhibited a physiological discoloration, appearing pale. Based on the results of subjective and objective examinations, as well as radiographic findings, the patient was diagnosed with chronic gingivitis accompanied by altered passive eruption. A gingivectomy and gingivoplasty were performed on tooth number 12. The patient was also prescribed paracetamol and a chlorhexidine mouthwash. The patient was advised to attend a follow-up appointment one week after the procedure and return one month later.

Conclusion: The surgical procedures performed were gingivectomy and gingivoplasty. One week after the surgery, the gingival still appears red. One month after surgery, the gingival condition had returned to normal and the shape of margin gingiva is aesthetically pleasing.

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INTRODUCTION

Tooth eruption consists of two stages, active eruption and passive eruption. During the active eruption stage, the tooth begins to grow in the occlusal, and during the passive eruption stage, the gingival tissue covering the upper part of the tooth moves downward, while the junctional epithelium returns to its usual position at the upper border between the enamel and the tooth root, with connective tissue attached at the lower part.¹² Developmental passive eruption is a condition in which the relationship between the tooth and the gingiva fails to undergo the passive eruption process properly after the tooth has become fully functional.³ Altered passive eruption (APE) is a hereditary and developmental disorder that occurs during passive eruption. Passive eruption refers to the process in which the gingival moves toward the root, allowing the top of the tooth to be seen.^{4,5} The periodontal ligament does not extend properly in the apical direction, away from the cemento-enamel junction (CEJ), causing the clinical crown to appear shorter.^{6,7}

APE occurs when the gingivals do not recede as the teeth erupt, resulting in a shorter clinical crown length.⁸ In addition to affecting the appearance of the smile, APE is also associated with a higher risk of gingival disease. Excess gingival tissue in the convex area of the tooth crown can lead to plaque buildup and inflammation around the gingivals. Furthermore, severe gingival conditions can increase the risk of recurrent gingival trauma.⁴

Treatment for APE cases may involve crown lengthening without osteotomy for aesthetic purposes.⁹ It is also not uncommon for APE to be managed with gingivectomy and gingivoplasty, which may often be associated with bone surgery to restore supracrestal tissue attachment.¹⁰ Supracrestal tissue attachment (STA) is the main factor affecting the position of the gingival line after gingivectomy treatments.¹¹ Gingivectomy is an excision procedure performed on the gingival area. By removing the pocket walls, gingivectomy facilitates the thorough removal of calculus and the performance of root planing procedures.¹² Meanwhile, gingivoplasty refers to the surgical reshaping of the gingival contour.¹⁰ The objective of this case report is to describe APE managed with conventional gingivectomy and gingivoplasty.

CASE REPORT

A 21-year old patient presented at Unimus Dental Hospital complaining that her upper front teeth appeared smaller. She had noticed this condition one month prior. In addition to the size of her teeth, the patient also complained that her upper front gingivals frequently bled when she brushed her teeth. The patient did not report any pain in the area of the teeth that appeared smaller. The patient denied having any systemic diseases, but had been taking iron supplements for the past few days. The patient has given written informed consent for the use of her information for any scientific publication.

During the initial examination, it was noted that the clinical crown of tooth 12 appeared shorter. Intraoral examination results showed an OHI score of 3,1 (moderate category), an O'Leary index of 66,9%, and positive Bleeding on Probing (BOP) on teeth 12,24, and 42. The results of pocket depth measurements on tooth 12 were as follows, mesio-facial 4 mm, mid-facial 4 mm, and disto-facial 3 mm. Meanwhile, the mesio-palatal depth was 3 mm, mid-palatal 2 mm, and disto-palatal 2 mm. the gingival margin of tooth 12 appeared more convex and asymmetrical compared to tooth 22. Additionally, the gingiva of tooth 12 exhibited physiological discoloration, appearing pale. The crown of tooth 12 appeared shorter and square. The clinical crown length of tooth 12 was 6 mm (Figure 1).

A panoramic radiograph revealed horizontal alveolar bone loss of approximately 3 mm in region 1 (Figure 2). Based on the results of the subjective examination, objective examination, and radiographic findings, the patient was diagnosed with altered passive eruption due to the coronally positioned of the gingival margin and also accompanied by chronic gingivitis on reduced periodontium due to the inflamed nature of said gingiva and pre-existing alveolar bone loss. A gingivectomy was planned for tooth 12.



Figure 1. Anterior Appearance of the Upper and Lower Jaws.



Figure 2. Panoramic Radiographic Examination.

Scaling and root planing were performed as initial-phase procedures prior to surgical intervention. Other initial-phase procedures included educating and instructing the patient on maintaining good oral hygiene. The second visit involved a treatment evaluation, conducted exactly two weeks after the initial treatment. The evaluation results showed improvement in the patient's oral hygiene, with the OHII score increasing to 1,5 (good category) and the O'Leary index at 32,2%. However, the Bleeding on Probing test showed an increase, with positive results on teeth 12,14,15,22,23,42,43, and 44. The increased BoP score might be caused by

inadequate at-home oral hygiene following the SRP procedure. Therefore, a follow-up dental health education was carried out at the next appointment to encourage the patient's oral hygiene effort. The probing depth on tooth 12 remained the same, showing neither a decrease nor an increase. The size and color of the gingiva on tooth 12 did not undergo significant changes.

At the next visit, a gingivectomy was performed on tooth 12, with 2 mm of gingival tissue removed. The procedure began with asepsis using povidone iodine antiseptic solution (Figure 3a). Infiltration anesthesia using a 1:80.000 epinephrine solution was administered to the surgical site to anesthetize the mucosa of tooth 12 (Figure 3b). A numb test was performed to evaluate the effectiveness of anesthesia on the mucosa. Bleeding points were created on the gingiva of tooth 12 using a probe and an explorer, tracing along the mesio-facial, midfacial, and disto-facial regions of the gingiva. The purpose of creating these bleeding points was to serve as a guide for gingival excision (Figure 3c). Gingivectomy was performed using a #15 blade with a 45° external bevel (Figure 3d). Hemostasis was achieved using sterile gauze (Figure 3e). Next, the granulation tissue was debrided using a Gracey curette #1-2, with the sharp edge directed toward tooth 12, until the surface was smooth and clean (Figure 3f). Hemostasis was reestablished using sterile gauze and irrigation with sterile saline solution (0,9% NaCl). Next, gingivoplasty was performed using a #15 blade to shape the gingival contour to match normal gingival anatomy (Figure 3g). The surgical site was closed using a periodontal pack to protect the surgical wound, prevent infection, control bleeding, reduce pain, and aid in the postoperative healing process (Figure 3h). The patient was provided with education and postoperative instructions, prescribed paracetamol 500 mg thrice daily, and a 0,2% chlorhexidine mouthwash, with a follow-up appointment scheduled one week after the procedure.

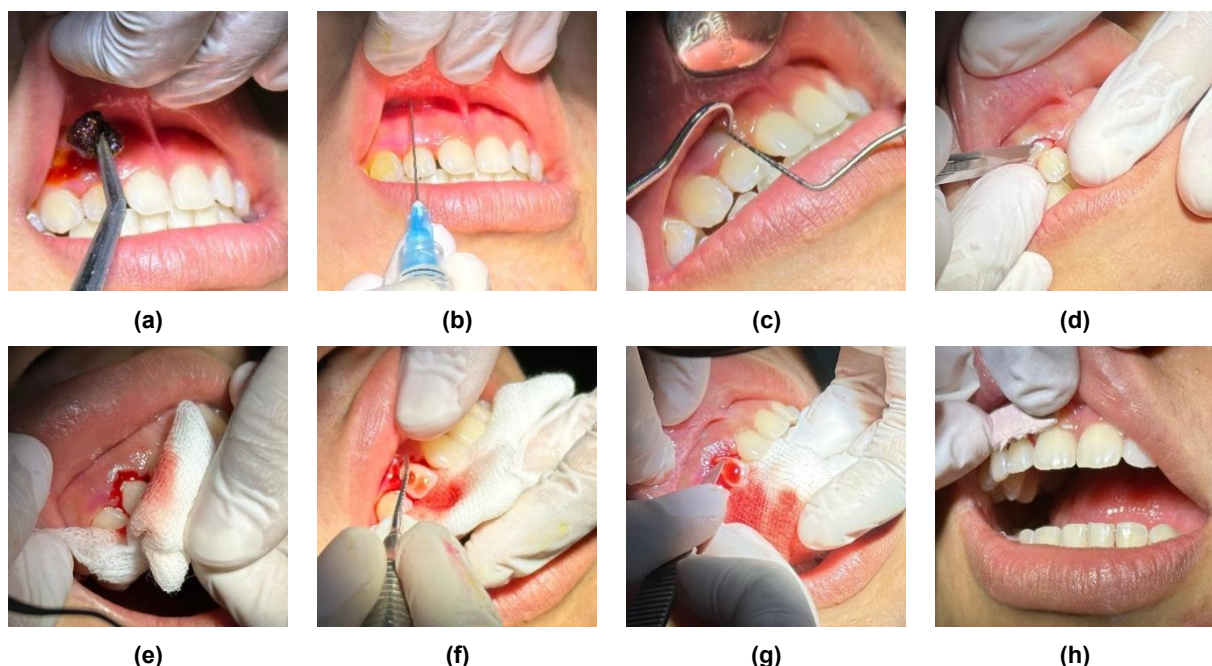


Figure 3. (a) Sterilization of the surgical site. (b) Anesthesia of the surgical site. (c) Creation of bleeding point. (d) Gingival incision. (e) Hemostasis of the surgical site. (f) Removal tissue with a #1-2 Gracey curette. (g) Gingivoplasty. (h) Application of a periodontal pack.

From the time of surgery until the first follow-up visit one week later, the patient did not report any pain. However, the patient complained of discomfort while eating due to a periodontal pack that was still attached to the gingiva of tooth 12 (Figure 4a). The periodontal pack was removed from the gingiva, and a postoperative

evaluation was performed. The gingiva of tooth 12 still appeared slightly red, a visible change was observed, namely that the gingiva appeared longer than before (Figure 4b). The patient was provided with education and instructions to maintain oral hygiene, and a second follow-up was scheduled one month after the surgical procedure.

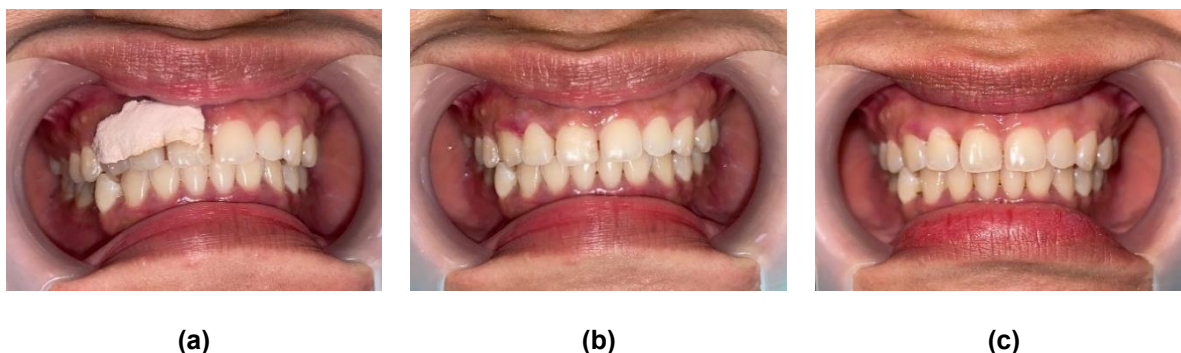


Figure 4. (a) Appearance of the periodontal pack one week after surgery. (b) Appearance after the periodontal pack was removed. (c) Appearance one month after surgery.

At the second follow-up, one month after surgery, the patient reported no complaints. The gingiva of tooth 12 appeared to have improved, with no inflammation or redness. The size and condition of the gingiva appeared normal and healthy (Figure 4c). The gingiva of tooth 12 has a knife-edge shape and appears symmetrical with tooth 22. The clinical crown shape of tooth 12 has changed to shovel-shaped, as is the normal condition. The length of the clinical crown of tooth 12, which was originally 6 mm, has increased to 8 mm. The patient feels comfortable and is satisfied with the surgical procedure that was performed.

DISCUSSION

Altered passive eruption generally causes discomfort, for example, excessive gingival tissue, which can trigger gingivitis.¹³ APE is influenced by various factors, both anatomical and systemic, which disrupt the normal migration pathway of gingival tissue, such as: a thick, fibrotic gingival biotype, which resists migration; excessive thickness of the buccal bone, which impedes bone remodeling, trauma due to dental pressure or soft tissue disruption during the eruption process, genetic predispositions affecting eruption patterns, trauma resulting from orthodontic treatment (such as intrusive forces), and systemic or endocrine issues affecting tissue balance.¹⁴ APE can be managed with the periodontal surgical procedure known as crown lengthening.

According to Coslet's classification, APE is divided into Types I and II, each of which has subtypes A and B.⁴

Table 1. APE Classification⁹

Classification	Condition
Type IA	Keratinized gingiva > 2 mm, alveolar crest-CEJ normal (1,5 mm)
Type IIA	Keratinized gingiva < 2 mm, alveolar crest-CEJ normal (1,5 mm)
Type IB	Keratinized gingiva > 2 mm, alveolar crest-CEJ not enough
Type IIB	Keratinized gingiva < 2 mm, alveolar crest-CEJ not enough

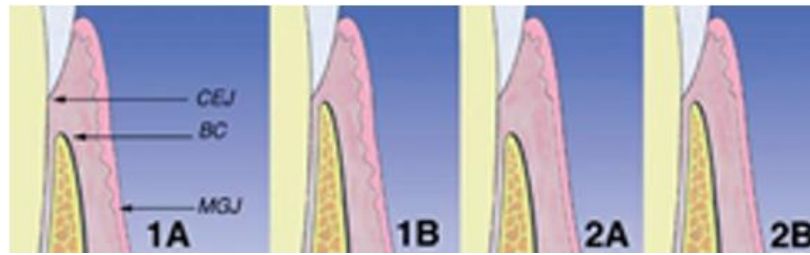


Figure 5. APE Classification⁹

The treatment required to manage cases of APE varies depending on the classification of the APE. Type IA is classified as gingivectomy or an apically positioned flap, type IIA as an apically positioned flap, type IB as gingivectomy/apically positioned flap and osteotomy/osteoplasty, and type IIB as an apically positioned flap and osteotomy/osteoplasty.¹⁴

In this case, the patient presented with APE on tooth 12. APE is characterized by the absence of damage or signs of inflammation in the periodontal tissues.⁹ This condition is often referred to as negative gingival recessions, indicating the coronal location of the gingival margin.¹³ In this case, the patient's condition was diagnosed as APE type IA. This condition is characterized by the gingiva covering the clinical crown, while the distance between the alveolar bone and the CEJ is normal. Based on this diagnosis, the patient underwent periodontal surgery or crown lengthening for aesthetic purposes, using gingivectomy and gingivoplasty procedures.^{15–17} Crown lengthening is a procedure designed to increase the amount of the tooth visible above the gingivals, for both restorative and aesthetic purposes.^{18,19}

Prior to the crown lengthening procedure, initial treatment such as scaling and root planing had been carried out, however the gingiva remained large, covering the clinical crown of tooth 12. Consequently, a further procedure gingivectomy was required.²⁰ A gingivectomy is a procedure involving the removal of soft gingival tissue to eliminate fibrous gingival tissue and remove the walls of the gingival pockets.^{12,21} The gingivectomy procedure is the simplest method for crown lengthening without the need to reduce bone.⁹

The gingivectomy procedure can be performed using conventional method, or lasers, and electrocautery.²² The use of a laser to remove plaque bacteria and hyperpigmentation is highly beneficial, particularly in cases of gingival hyperplasia caused by calcium channel blockers.^{23,24} The laser method is the least invasive approach, no thermal damage effects in tissues, accelerating the healing process, and having a lower recurrence rate.^{23,25}

Gingivectomy combined with gingivoplasty is the appropriate procedure for this case as it not only helps to reshape the gingiva line, but also helps to improve aesthetics. In addition to being straightforward, gingivectomy with gingivoplasty involves relatively low surgical costs.^{24,26} One month following the procedure, the gingival condition returns to a healthy and normal state, and the patient is satisfied with the results of the procedure.

CONCLUSION

In this case, the patient presented with developmental abnormality during passive tooth eruption, specifically altered passive eruption. A non-surgical procedure, namely scaling and root planing was performed. Following the non-surgical procedure, the gingiva of the patient's tooth 12 continued to cover the clinical crown of the tooth, necessitating surgical intervention in the form of gingivectomy and gingivoplasty. One week after

the surgical procedure, the patient's gingival condition began to return to normal and improve. One month following the surgical procedure, the patient's gingival condition had returned to normal and healed

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