

## A Multidisciplinary Approach to the Crown Lengthening Procedure Which Made by the Osteoplasty and Apically Positioned Flap Technique: A Case Report

Osteoplasti ve Apikale Kaydırılan Flep Tekniğiyle Kuron Boyu Uzatma İşlemine

Multidisipliner Yaklaşım: Olgu Sunumu

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### Özet

Kısa klinik kuronlar restorasyonların tutunmasında olumsuz etkilere neden olabilmektedir. Cerrahi olarak kuron boyunun uzatılması işlemi, biyolojik genişliği ihlal etmeden klinik kuron boyunun artırılmasına imkan vermektedir. Kuron boyu uzatma özellikle kuronun protetik restorasyon için yetersiz olduğu vakalarda gerekli olmaktadır. Bu vaka raporunda, osteoplasti ve apikale kaydırılan flep tekniğiyle maksiller anterior dişlerdeki aşırı kuron harabiyeti varlığında kuron boyu uzatma işlemi sunulmuştur.

**Anahtar Kelimeler:** Kuron boyu uzatma, osteoplasti, apikale kaydırılan flep

### Abstract

Short clinical crowns can lead to adverse effect on the retention of the tooth restoration. Surgical crown lengthening operation allows for an increase in the clinical crown length without violating the biological width. Crown lengthening should be necessary especially in case of clinical crown length isn't adequate for prosthetic restoration. In this case report; we reported crown lengthening procedure which made by osteoplasty and apically positioned flap technique to the maxillary anterior teeth which had excess crown damage.

**Key Words:** Crown lengthening, Osteoplasty, Apically positioned flap

### Introduction

Caries, erosion, tooth malformation, fracture, erosion, attrition, excessive tooth

reduction, exostosis, eruption disharmony and genetic variation are the most common causes of short clinical crown(1). For this reason, it is necessary to increase this deficiency in the clinical crown length when the margins of caries or margins of the tooth fractures are subgingivally placed, the crown is too short for retention of the restoration, there is an excess of gingiva

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and anatomical tooth crown is partially erupted (2).

The aim of crown lengthening is to provide a tooth crown dimension adequate for a stable dentogingival complex and for the placement of a restorative margin and an aesthetically pleasing final restoration without violating the biologic width (3, 4).

Several techniques such as gingivectomy, apically repositioned flap with or without resective osseous surgery, and orthodontic forced eruption with or without fibrotomy have been proposed for clinical crown lengthening(4). The choice of any of these techniques depends on many factors such as aesthetics, clinical crown to root ratio, root morphology, tooth position, ability to restore the teeth and patient wish(1, 5)

In this case report; we reported crown lengthening procedure which made by osteoplasty and apically positioned flap technique to the superior anterior teeth which had excess crown damage.

### Case Presentation

A 58-year-old systemically healthy female patient was referred to our clinic with a complaint of pain at superior full mouth bridge prosthesis. In full mouth examination; we found out that maxillary right central, left central, lateral and canine teeth need endodontic treatment. We decided to perform crown lengthening for

increasing bridge retention because of excess crown damage. We discovered that number left central, lateral and canine teeth had clinically 1-2 mm crown length. After initial periodontal therapy, we planned osteoplasty with apically positioned flap. We included number 11 teeth for protecting bilateral symmetry. Preoperative clinical and periapical radiographic views are shown in figures 1 and 2.



Figure 1: Initial clinical view

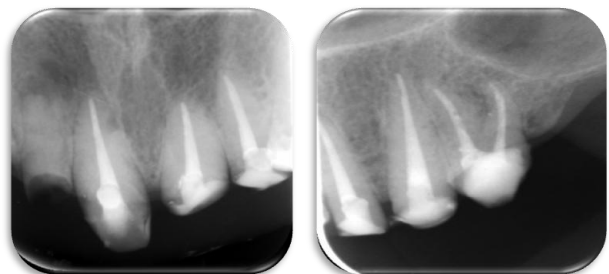


Figure 2: Preoperative periapical radiographic views

Teeth mobility, width of attached gingiva, probing pocket depth and bleeding on probing were measured at baseline, first and third month. Full thickness mucoperiosteal flap was reflected and 2-3 mm bone removed with rotary instruments. Flap positioned to the apically and procedure ended with 5-0 (WEGO-PGLA, Foosin Medical Supplies, England) suture (Figure 3).



**Figure 3:** Operation time

Operation area covered with Coe-Pak (GC America Inc,IL,ABD). Patient was prescribed anti-inflammatory drug and chlorhexidine after operation. No complications were observed. Surgical pack and sutures were taken postoperative 14<sup>th</sup> day (Figure 4). Postoperative first-month clinical appearance is shown in figure 5.



**Figure 4:** Postoperative clinical view at 14 days



**Figure 5:** Postoperative clinical view at first month

Prosthetic treatment completed after 4-5 mm crown length gain which allows to making prosthetic restoration (Figure 6).



**Figure 6:** Clinical view after prosthetic restorations

### Discussion

Crown lengthening is performed for a good aesthetic and functional result when during restoration of teeth with subgingival caries or fractures and this surgical procedure can establish an accurate bone width(3) and correct gingival asymmetries(6).

There are two aspects to the crown lengthening procedure: Esthetic and functional. In both cases, the surgical procedure is aimed at re-establishing the biological width, apically while exposing more tooth structure. In the seminal study by Gargulio et al, a proportional relationship was established between the crest of alveolar bone, the connective-tissue attachment, the epithelial attachment, and the gingival sulcus. Their research presented an average sulcus depth of 0.69 mm, an average epithelial attachment of 0.97 mm, and an average connective-tissue attachment of 1.07 mm connectivetissue attachment averaged 2.04 mm, and has come to be known as the biologic width. Biological width is the sum of the

junctional epithelium and supracrestal connective tissue attachment. Violation of biological width has been associated with gingival inflammation, discomfort, gingival recession, alveolar bone loss and pocket(7). In many articles, it has been discussed that a minimum of 2 mm of biological width should be maintained relative to the margin of the restoration(8, 9). This has become the standard for crown-lengthening procedures. In 1961, Gargulio et al. reported variable ranges of epithelial attachment from 0.08 mm to 3.72 mm, pocket depth from 0.0 mm to 5.36 mm, and connective tissue from 0.0 mm to 6.25 mm(7). In 1981, Ramfjord questioned the surgical need for the creation of a 2-mm to 3-mm biologic width apically according to the recommended restoration margin. According to the theory, as long as adequate oral hygiene is provided, it would be better for the body to create its own biological width(10). Data by others show that this may, in fact, be impossible and need of the surgical. The aesthetic crown lengthening requires gingivectomy surgery in order to obtain adequate clinical crown; therefore, a minimum of 2 to 5 mm keratinized tissue is required to preserve gingival health(11, 12). Moreover, the management of the papilla is a very important aspect of the surgery. The interproximal bone should be carefully removed to preserve the anatomical structures. This allows coronal growth of interdental tissues. The distance between the base of contact area of the teeth and the bone crest must be about 5 mm or less, so that the papilla can form again(13, 14). To have a harmonious and long-

term successful restoration and protect the biological width, the distance between the crest bone and the prosthesis should be at least 3 mm(15). Many studies suggest that the biological width reestablishes itself the operation of crown lengthening 6 months after(16, 17). After all surgical operations involving the bone, bone resorption occurs. 1970, Wilderman M. N. et al. detected 0.6-0.8 mm spontaneous bone resorption a year after the surgical procedure(18). In the crown lengthening made by osteoplasty, there are studies that histologically examine the recovery of the biological width. Oakley E. et al. (1999) performed study on monkeys to explain resorption of marginal bone and how gingival-tooth attachment forms during healing after surgical procedures. Conclusion of study, showed recovering of gingival biologic width, formatting of epithelial attachment to marginal bone and formatting of connective tissue attachment during marginal bone resorption(17).

Several techniques such as gingivectomy, apically repositioned flap with or without resective osseous surgery, and orthodontic forced eruption with or without fibrotomy have been proposed for clinical crown lengthening(4). Surgical treatment is faster and more favorable for indirect restoration when higher clinical tooth crown is necessary. The most stable method among surgical procedures is crown lengthening procedure which made by osteoplasty and apically positioned flap technique. The results of the present clinical investigation demonstrated that during 3-month healing period following surgical crown

lengthening with apically positioned flap and osseous resection the marginal periodontal tissues showed no distinct tendency to grow in a coronal direction. However, in the gingivectomy, marginal periodontal tissues showed a tendency to grow in the coronal direction(19). The orthodontic treatment has a lot of advantages performing clinical crown lengthening but it is relatively long and expensive, uncomfortable for patient. In addition, surgical treatment was required at this case.

### Conclusion

In this case report, we reported success of crown lengthening procedure with osteoplasty and apically positioned flap technique at teeth which has inadequate clinical crown length especially in the anterior region, where esthetics is of great concern.

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