

## Aesthetic Surgical Crown Lengthening With Hard and Soft Tissue Management

Dr. Anil K Tomer, Dr. Leena Tomer, Dr. Vipul Sapra, Dr. Gaurav Bhardwaj,  
Dr. Nidhi Malik, Dr. Sagarika Muni

(Department of Conservative Dentistry and Endodontics, D.J College Of Dental Sciences and Research, Agra University, Meerut, India)

---

**Abstract:** The maintenance of biological width is of utmost importance in restorative procedures. Crown lengthening requires thorough clinical judgement so that the biological width is not violated. This case report explains the strategies that need to be followed during crown lengthening.

---

### I. Introduction

Surgical crown lengthening involves the reshaping of soft and hard tissues to a more desired contour. Badly mutilated teeth or the grossly decayed teeth often pose problems to the restorative dentists during their treatment due to unavailability of sufficient clinical crowns. Hence a crown lengthening procedure prior to restorative treatment is mandatory during management of such teeth. The first case presented is of a middle aged male patient who was treated with surgical crown lengthening. The challenges of aesthetics and functionality were tried to be addressed. The other two cases are demonstrated to show the crown lengthening using electro cautery.

### Case Report 1

A 32 years old male patient presented to the department with the chief complaint of bad looking lower anterior teeth since more than one year. The patient was unhappy with the tissue height and tooth form. On examination, the patient had a deep bite with generalized attrition. The patient was in excellent general health with no known allergies, did not take medication and denied tobacco use. The lower anterior teeth were around 1mm in height. (Figure 1). The patient did not want a full mouth rehabilitation. This made surgical crown lengthening procedure a more preferred option.



**Figure 1**

A stone cast model was prepared of the patient and a surgical guide was fabricated. The desired soft tissue profile was drawn and was replicated in the stent (Figure 2). The amount of gingival recontouring and osteotomy were to be guided by the stent and adjustments were then made.



**Figure 2**

At the day of surgery, under local anaesthesia, the first incision was placed at the final desired location of the gingiva. A number 15 blade was used for initial incision. Using a #12 blade, the crevicular incision was placed and the collar of gingiva was removed. The gingiva was contoured as finally desired before reflection of the flap. (Figure 3) Using a round carbide bur, osseous resection was performed only on the buccal surface, exposed 3 mm of root surface from the gingival margin to the alveolar crest; this allowed for attachment of the junctional epithelium and connective tissue. The alveolar height on the lingual side needed only slight osteoplasty.



**Figure 3**



**Figure 4**

The bone was contoured such that 3mm of distance was created between the desired crest of the restoration and the alveolar margin. The alveolar margins were smoothed using bone file. Suturing was done using 3-0 nylon sutures. The final location of the margins can be seen in figure 5.



**Figure 5**

Figure 6 shows the final restorations in place. The increase in crown height was attained without increasing the vertical dimension of the patient.



**Figure 6**

**Case Report 2**

22 years old female patient reported to the department with the chief complaint of food impaction in her right upper back tooth since 4 months. On examination, her right first premolar was found to be grossly carious (figure 7). After root canal treatment, post and core was done using fibre post. Crown lengthening was performed to incorporate the proper finish lines as shown in figure 8.



**Figure 7**



**Figure 8**

**Case Report 3**

A middle aged male patient complained of pain in his right lower back tooth region of jaw since 2 months. On examination, the right lower first molar was grossly carious. Upon completion of root canal treatment, the major concern was limited vertical height of the clinical crown. To incorporate proper finish lines, the crown lengthening was done using electro cautery (figure 9).



**Figure 9**

## **II. Discussion**

Gingival biological width (biologic membrane, dentogingival attachment) is the area of gingiva attached to the surface of the tooth coronary from the alveolar bone. This determination is based on the study of Garguilo A.W., Wentz F. and Orban B. in 1961 on dentogingival junction of cadavers (1). It was established the width necessary for gingiva to attach to the tooth. In their study, 287 teeth of 30 cadavers were used, relationship between marginal alveolar bone, connective tissue attachment (CTA), epithelial attachment (EA) and gingival sulcus (GS) were established. Results showed the mean connective tissue attachment is 1.07 mm, epithelial attachment – 0.97 mm, dental sulcus – 0.69 mm. Gingival biological width (GBW) was calculated by adding widths of connective tissue attachment and epithelial attachment:  $GBW = CTA + EA = 2.04$  mm (1). The incisogingival length and mesiodistal width of the periodontal tissues in the anterior maxillary region can be altered and thus, the crown lengthening procedure can build a harmonious appearance and improve the symmetry of the tissues (2). The level of the alveolar crest must be determined prior to any considerations regarding aesthetic crown lengthening.

Lee EA (3) proposed a classification system for Aesthetic Crown Lengthening Procedures according to the soft and hard tissue relation. Our first case can be classified as Type II where sufficient soft tissue allows gingival excision without exposure of the alveolar crest but in violation of the biologic width. The operator should also be instructed to reposition the flaps coronally, rather than apically, in order to maximize tissue preservation and allow the anticipated revisions to the gingival margin that will follow once healing from the osseous surgery has been completed (4,5). Other methods of crown lengthening include the use of Lasers or other devices such as electrocautery. Case 2 and 3 have been treated by electrocautery alone. The level of the alveolar crest allowed the gingivectomy alone as the biological width had not been violated.

Other method is by orthodontic extrusion of the tooth. The orthodontic treatment has a lot of advantages performing clinical tooth crown lengthening but it is relatively long and expensive, uncomfortable for patient, and surgical treatment is still necessary. The post operative care includes the use of Nonsteroidal anti-inflammatory drugs and mouth rinses with 0.1-0.2% Chlorhexidine Digluconate solution for a period of 4 weeks. Gentle brushing may be advocated. Sutures are usually removed after 1 week. After crown-lengthening surgery, the periodontium continues to remodel and mature. Bragger and others (6) reported that gingival recession can occur between 6 weeks and 6 months after the surgery. Hence, if prosthetic reconstructions are planned, recessions must be closely observed during the healing phase. Temporary crowns should be retained until the wounds are completely healed, after which final crown preparation and insertion can be accomplished.

## **References**

- [1]. Gargiulo AW, Wentz F, Orban B. Dimensions and relations of the dentogingival junction in humans. *J Periodontol* 1961; 32: 261-7.
- [2]. Lai YJ, Silvestri L, Girard B. Anterior Esthetic Crown-Lengthening Surgery: A Case Report. *Journal de l'Association dentaire canadienne* 2001; 67(10):600-3.
- [3]. Lee EA. Aesthetic Crown Lengthening: Classification, Biologic Rationale, And Treatment Planning Considerations. *Pract Proced Aesthet Dent* 2004; 16(10):769-778.
- [4]. Lee EA, Jun SK. Achieving aesthetic excellence through an outcome-based restorative treatment rationale. *Pract Periodont Aesthet Dent* 2000; 12(7):641-648.
- [5]. Lee EA, Jun SK. Aesthetic design preservation in multidisciplinary therapy: Philosophy and clinical execution. *Pract Proced Aesthet Dent* 2002; 14(7):561-569.
- [6]. Bragger U, Lauchenauer D, Lang NP. Surgical lengthening of the clinical crown. *J Clin Periodontol* 1992; 19(1):58-63.