International Journal of Dentistry Scientific
Volume 2, Issue 1, Page 1-5, December 2024
ISSN: 3031-7142

Crown Lengthening Surgery for Anterior Esthetic Restoration: Case Report

Nuzulul Ismi[1*], Maulidia Indah Sari[2]
[1]Lecturer, Department of Periodontics, Faculty of Dentistry, Syiah Kuala University, Indonesia
[2]Lecturer, Department of Conservative Dentistry, Faculty of Dentistry, Syiah Kuala University, Indonesia
*Correspondence author email: nuzulul_ismi@usk.ac.id

Article info: Received: 1-10-2024; Revised: 5-11-2024; Accepted: 10-12-2024; Publish: 30-12-2024

ABSTRACT
Crown lengthening surgery (CL) is a procedure that aims to reduce periodontal tissue to increase clinical crown height by maintaining the biological width for the placement of the final restoration. CL surgery will also affect the smile line for a better aesthetic appearance. **Objective:** To explain CL surgery for the aesthetic restoration needs of maxillary anterior teeth with the help of Chu-gauge examination. **Case Report and Treatment:** A 20-year-old female patient was referred by a Conservation Specialist to Periodontics with complaints of discolored maxillary anterior teeth since 2016 post-trauma. A consultation was conducted due to the need for final restorations considering the smile line and existing design. Clinical examination revealed inadequate restoration of tooth 21, gingival excess of teeth 12 and 22, edema, and plaque score of 10.3% (O'Leary). The use of Chu-gauge in gingivectomy to maintain an ideal crown ratio. Flap surgery was accompanied by osteotomy to maintain biological width. Then the flap was repositioned with a mattress vertical suture. **Result:** CL surgery to maintain periodontal tissue condition and biological width in final restoration selection. **Conclusion:** CL aesthetic surgery with osteotomy showed good results in terms of clinical crown dimension, gingival contour, and osseous level.

Keywords: *Crown Lengthening Surgery; Biological Width; Aesthetic Restoration; Ostectomy*

INTRODUCTION

In general, an attractive smile improves a person's appearance, one of the influencing factors is the clinical appearance of the gingiva. Gingiva clinical appearance around the teeth has an important role aesthetically, especially in the maxillary anterior region. Dentists must be able to develop a comprehensive treatment plan, the one is the indication of crown lengthening (CL). Crown lengthening is a surgical procedure aimed at improving the crown structure by positioning the gingival margin more apically with or without an ostectomy.[1,2]

It is performed to facilitate the final restoration and aesthetic needs. The procedure aims to preserve the biological width (BW) related to the health of the periodontal tissues as well as to effect sufficient retention and resistance of the final restoration. Indications for CL include tooth conditions with subgingival caries, crown fracture, short clinical crown features, inadequate axial height for restoration retention, and altered passive eruption.[2,3]

Biological width is the physiological dimension of junctional epithelial (0.97) mm and connective tissue attachment (1.07 mm), with an average BW dimension of 2.04 mm and gingival sulcus depth (0.69 mm).[4] This report aims to explain the surgical procedure of CL with ostectomy for final restoration needs after root canal treatment which is a referral from the dental conservation department.

CASE REPORT

A 20-year-old woman was referred by a conservation specialist with complaints of wanting to repair an existing, discolored restoration. The patient found this condition distracting when she smiled (Figure 1). The patient's general health was good, clinical examination shows inadequate restoration of tooth 21, gingival excess of tooth 12,22, edema, bleeding on probing (+), average sulcus depth of anterior teeth 2-3 mm, plaque score of 10.3% (O'Leary) and root canal treatment of tooth 21. A radiographic examination of tooth 21 was well done without periapical lesions (Figure 2).

Figure 1. Clinical appearance when the patient smiles

Figure 5. Bleeding points overview

Figure 2. Radiographic examination of tooth 21 after root canal treatment

Figure 6. Ostectomy using a bur

Figure 3. Bone sounding examination

Figure 7. Suturing with mattress vertical suture technique.

Figure 4. Clinical crown inspection using Chu's gauge

Figure 8. 2-month follow up with final restoration

TREATMENT

The treatment plan recommended CL surgery to increase the expansion of the supragingival tooth structure and maintain the biological width (BW) to produce a healthy and optimal relationship between the final restoration and the periodontium tissue. Initial treatment scaling was performed and followed by surgical crown lengthening of the maxillary anterior region, performed under local

anesthesia. A bone-sounding (BS) examination was performed to measure the distance between the alveolar bone and the gingival margin.[5]

The result of bone sounding measurement using a UNC 15 probe was 3.5-4 mm (Figure 3). Next, the clinical crown of the tooth was measured using Chu's gauge [6] (Hu-Friedy Inc, Chicago) to maintain the ideal clinical crown ratio (Figure 4) and marked the desired clinical crown height with a bleeding point guide on teeth 12 and 22 (Figure 5). An external bevel incision was performed at the bleeding point area and followed by mucoperiosteal flap surgery of regions 12-22 accompanied by ostectomy of teeth 21, and 22 to maintain BW for final restoration preparation (Figure 6).

After the ostectomy, the mucoperiosteal flap was repositioned and sutured with a vertical mattress suture technique (Figure 7). Post-surgical instructions to a patient include the administration of antibiotics, analgesics, and 0.2% chlorhexidine mouthwash. Follow-up was done to remove the sutures on day 14 and observe the healing process before proceeding with the final restoration placement.

CONCLUSION

CL procedures can be taken appropriately if the dentist can correctly identify and analyze the problem. Examination of gingival position, alveolar bone, and clinical crown length are factors to identify the problem. Studies show that a minimum of 3 mm of space between the margin of the restoration and the alveolar bone will be adequate for the maintenance of periodontal tissue health, consisting of 2 mm BW and 1 mm gingival sulcus depth. [2,7] The CL procedures in this case utilized Chu's gauge which was used in checking the clinical dimensions of the crown and gingival contour to ensure symmetry when smiling.[6]

Long-term restoration success can be achieved by a combination of correct restorative principles and periodontal tissue maintenance. Unhealthy periodontal tissue is one of the factors that cause failure in restoration procedures. CL surgery is one of the measures chosen to facilitate restoration, restore function, and improve aesthetics. [1,2] This report can be concluded to have a high treatment success rate if appropriate case selection can be considered.

REFERENCES

1. Dengre A , Kumar G , Garg S. Anterior Esthetic Crown-Lengthening Surgery: A Case Report. *International Journal of Enhanced Research in Medicines & Dental Care* (IJERMDC).2018 Vol. 5 Issue 5: 28-9.
2. Dholey MK, Sinha S, Kole D. The Crown Lengthening Surgery: Two Case Reports. *Asian Pac J Health Sci*. 2018;5(4): 23-6.
3. Camargo PM, Melnick PR, Camargo LM. Clinical Crown Lengthening in the Esthetic Zone. *CDA Journal*. 2007;35 (7): 488
4. De Oliveira PS, Chiarelli F, Rodrigues JA, Shibli JA, Zizzari VL, Piattelli A, et al. Aesthetic Surgical Crown Lengthening Procedure. *Case Rep Dent*. 2015; vol 2015: 1-3.
5. Apri Buana AAGB, Murdiastuti K. Esthetic crown lengthening with ostectomy and frenotomy for treatment of gummy smile: A case report from Prof. Soedomo Dental Hospital, Yogyakarta-Indonesia. *Indonesia Journal of Biomedical Science*. 2019 Jan 9;12(2): 32-4.
6. Alejandro Quiñones J, Ruth Garza Salinas DDS B, Cruz Fierro DDS N, Isela Sánchez Nájera DDS R, Jaime Flores Treviño DDS J, Rodríguez Delgado DDS I, et al. Crown lengthening procedure using aesthetic measurement gauges: A case report. *International Journal of Applied Dental Sciences.* 2017;3(2):95–6.
7. Anoop S. Crown lengthening surgery: A periodontal makeup for anterior esthetic restoration. *Journal of Interdisciplinary Dentistry*. 2018;8(3):132.