

Chu'S Crown Lengthening Gauges the Start to a Perfect Smile – Case Report

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Abstract: The present study is a case report of gingivectomy in the upper anterior teeth region using the Chu aesthetic gauges to guide crown lengths with satisfactory aesthetic result. To perform the gingivectomy and regulate crown length, the probing depth (PD) was assessed using a periodontal probe and the length of the crown was measured using Chu aesthetic gauges. The amount of gum to be removed was determined by making bleeding points with a periodontal probe. Then, one inner bevel and one intrasulcular incision were performed to enable the removal of gum cervical collar with periodontal cures. The study concluded that the periodontal aesthetic crown regularization using Chu aesthetic gauge can be a viable option for a predictable and aesthetic outcome.

Key Words: Chu's Aesthetic gauges, the crown lengthening procedure (CLP), clinical crowns

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I. Introduction

An attractive smile enhances the appearance and acceptance of an individual in society¹. In the planning of dental treatments, aesthetic considerations are highly relevant due to the relationship between smile and facial beauty². The crown lengthening procedure (CLP) is commonly used to achieve an esthetic smile and to maintain in optimal conditions of the dentogingival complex.

Abnormalities in symmetry and contour can significantly affect the harmonious appearance of the natural or prosthetic dentition. Nowadays, patients have a greater desire for more esthetic results which may influence treatment choice. An ideal anterior appearance necessitates healthy and inflammation-free periodontal tissues. Garguilo described various components of the periodontium giving mean dimensions of 1.07 mm for the connective tissue, 0.97 mm for the epithelial attachment and 0.69 mm for the sulcus depth³. These measurements are known today as the biologic width.

Hence, they recommended that the restorative margin should be a minimum of 3 mm coronal to the alveolar crest, suggesting that this margin could be achieved through a surgical intervention known as crown lengthening surgery. Some authors have questioned the necessity of this procedure, suggesting that if the biologic width is invaded, the body can re-establish the necessary dimensions on its own over time⁴. However, it is generally accepted that crown-lengthening surgery helps to relocate the alveolar crest at a sufficient apical distance to allow room for adequate crown preparation and reattachment of the epithelium and connective tissue. Furthermore, by altering the incisogingival length and mesiodistal width of the periodontal tissues in the anterior maxillary region, the crown-lengthening procedure can build a harmonious appearance and improve the symmetry of the tissues.

There are different techniques used to perform a CLP in the anterior teeth, one of them is the technique with "Aesthetic Measurement Gauges" (Chu's Aesthetic gauges, Hu-Friedy Inc, Chicago, IL), these gauges allow a mathematical evaluation of the size of a clinical crown directly on the patient, also determine the height of the biological crown and interdental papilla during the procedure⁵. The purpose of this article was to describe a CLP in anterior teeth that had an asymmetric gingival contour using aesthetic measurement gauges.

II. Case Report

A 27-year-old male patient with no medical history of interest was referred to the Department of periodontics, Farooqia dental college and hospital, Mysuru. The patient mentioned that he had complaints of difficulty while brushing because of shortened teeth.

His medical history was non-contributory, and he denied a history of smoking or alcohol consumption. Extraoral examination revealed no significant findings. Periodontal examination revealed good oral hygiene with minimal plaque and calculus deposits. The gingiva was pink and firm, and the papillae were intact. Clinical examination revealed shallow probing depths, no mobility and adequate amounts of keratinized attached gingiva. Review of the full mouth series revealed no significant findings. The crestal bone level was within normal limits, and the crown to root ratio was favourable. Occlusal analysis revealed, among other findings, an Angle's class I relationship, with 70% overbite and 2 mm of overjet. No signs of fremitus were observed. The patient had adequate anterior guidance upon protrusion and adequate group function upon lateral excursions.

The "T-bar tip" (Chu's Aesthetic gauges, Hu-Friedy Inc, Chicago, IL) was used as a guide to establish a correct dimension of clinical crowns. The gauge was placed in the center of the tooth and it was observed that the red marks of the horizontal arm determined the width of the tooth; therefore, the red mark of the vertical arm indicated the height of the clinical crown (figure 3A). Local anaesthesia was administered with 2% Lignocaine and adrenaline injection IP and bleeding points were performed to mark the desired height of the clinical crowns. (Figure 3B).

Mucoperiosteal flap was elevated and sufficient osseous resection was done in order to obtain an adequate biological crown (Figure 4). Bone was also recontoured to harmonize with tooth surface topography. Flap was repositioned and interrupted sutures were placed (Figure 5)

Patient was recalled after one week, the sutures were removed and the surgical area was flushed with antimicrobial solution. In the third month of follow-up, the gingival contours of the teeth were symmetrical and matched by the proportion indicated by aesthetic measurement gauges (Figure 7).

III. Discussion

In the present article, a CLP was described using the aesthetic measurement gauges, in addition to achieving an appropriate dimension of clinical crown and osseous level, an adequate level of interdental papilla was obtained. A minimum of 2 to 5 mm of keratinized tissue is required for gingival health⁶. It is important to mention that the papilla display should be evaluated during the smile design of a patient⁷. There are different treatment options for the management of short clinical crowns⁸. Therefore an adequate treatment plan should be performed to establish an optimal procedure for each patient. In our case it was different because the purpose was the correction of gingival asymmetry.

IV. Conclusion

A successful CLP was performed using aesthetic measurement gauges; the optimal dimension of clinical crowns, symmetrical gingival contour and adequate osseous level was obtained with this technique.

The clinical relevance of this study lies in a step by step approach to periodontal aesthetic crown lengthening, which was undertaken using an innovative aesthetic measuring gauge, the Chu aesthetic gauge, which not only determined the ideal crown length of a tooth but also enabled as with a visual precision which was distinct from the conventional guessing or emotional estimations in crown lengthening which is vital for successful, predictable, and aesthetic restorative outcome.

However, to plan a crown lengthening procedure, the whole periodontal condition of the patients and their hygiene habits should be evaluated. Furthermore, an accurate diagnostic and interdisciplinary approach is mandatory for obtaining improved, conservative, and predictable results in esthetic areas.

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Figure 1: Armamentarium

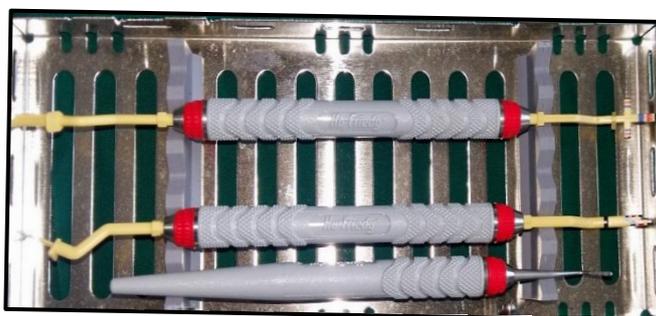


Figure 2: Aesthetic Measurement Gauges (Chu's Aesthetic gauges, Hu-Friedy Inc, Chicago, IL)



Figure 3: T-bar tip. A) The red marks of the horizontal arm indicated the width of the clinical crown, therefore the red mark of the vertical arm indicated the height. B) Bleeding points were performed to indicate the height of the clinical crowns.



Figure 4: Mucoperiosteal flap was elevated and sufficient osseous resection was done.



Figure 5: Flap was repositioned and interrupted sutures were placed.



Figure 6 : Pre Operative Views



Figure 7: Post Operative Views after 3 months

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