

IMPROVING SMILE WITH CROWN LENGTHENING AND DIASTEMA CLOSURE: A CASE REPORT

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ABSTRACT

Insufficient clinical crown height pose problems to the prosthodontists during crown fabrication. To overcome this challenging situation we go for crown lengthening before tooth preparation for a crown (provisional as well as definitive crown) to enhance the retention form. Crown lengthening is a surgical procedure designed to increase the extent of the supra-gingival tooth structure.

KEY WORDS

Clinical Crown, Crown Lengthening, Dento-gingival Complex, Aesthetics, Retention, Biological width, PFM Crown

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INTRODUCTION

The concept of crown lengthening was introduced by D.W. Cohen in 1962.¹ Clinical crown lengthening refers to procedures designed to increase the extent of supragingival tooth structure for retention of crown, and aesthetic purposes.² This procedure often employs some combination of tissue reduction or removal, osseous surgery, and orthodontic extrusion for tooth exposure. The amount of tooth structure exposed above the osseous crest (about 4mm) must be there to provide for a stable dentogingival complex and biologic width to permit proper tooth preparation and account for an adequate marginal placement, thus ensuring a good marginal seal with retention for both provisional and final restorations.³

In some instances where a crown is short because of caries, fracture, excessive wear, or developmental abnormalities, restorations usually are extended apically to increase the retentive surface of the preparation.⁴ But injudiciously extending the preparation so much subgingival that they approach the crest of alveolar bone may encroach on the "biologic width." This is the area of tooth surface to which epithelial and connective tissue attachment occur⁵; it extends about 2.04mm coronally to marginal bone. If the margin of a preparation encroaches on this minimum width, it may become an iatrogenic factor and may result in periodontal disease with resulting bone resorption. So the option we have here is to go for crown lengthening, which is achieved by crown lengthening surgery.⁶

Success and longevity of crown, and thus the need to have adequate supragingival tooth tissue, is critical. The need for healthy periodontal tissues to support these restorations also cannot be overstated. Crown lengthening surgery is rationalised by proper understanding of the relationship of restorative margins to the biological width.

Application of concept of biologic width is of key importance when planning placement of margins of tooth preparations as the restoration margin should not be placed more than 0.5-1 mm subgingivally (if it done so biologic width will be violated.^{7,8}). So, rather than placing a subgingival margin (>1mm) it is better to go for crown lengthening and place a supra gingival preparation margin (if esthetics allow) with predictable success.



Fig1: Pre op view



Fig2: Crown preparation



Fig3: Crown lengthening



Fig4: Suture placement done



Fig 5: Temporization following crown lengthening



Fig 6: Final Crown placement



Fig7 : Smiling patient

CASE REPORT

A 54 year old female patient came to our Department of Prosthodontics & Crown and Bridge with complain of unaesthetic smile due to gap between the teeth (Fig1).

On thorough intra-oral examination, it was revealed that mandibular anterior teeth (31 32 41 42) was grossly attrited, only 2mm of clinical crown length was available and attached gingiva was about 5mm; the maxillary central incisor was distally inclined and there was a diastema of 3mm between 11 21.

So, the treatment plan decided was to close the diastema using PFM crown and attrited mandibular anterior teeth was planned for endodontic treatment

followed by crown lengthening and PFM crown placement.

A diagnostic impression was made with irreversible hydrocolloid (Algitex,DPI) for both the arches followed by fabrication of the diagnostic cast with dental stone(B N stone)

For diastema closure diagnostic wax upwrt 11 12 21 22 was done with inlay wax (and after approval of the patient followed by crown preparation and temporization according to diagnostic wax up. Impression was made with putty (President putty, Coltene) and light body impression material (of prepared crown area). Then metal ceramic crown was fabricated using diagnostic wax up.

For management of the insufficient clinical crown length of mandibular teeth firstly, the arbitrary

preparation of 31 32 41 42 teeth and the gingival area was done on the diagnostic cast. Then diagnostic wax up was done. Temporary crown was fabricated on the prepared diagnostic cast with tooth coloured acrylic resin (self cure Tooth Molding powder, DPI)

Crown preparation was done first for the above mentioned teeth (Fig2) in order to access the interproximal region then temporary crown was placed and used as a guide for the amount of tissue removal (both soft tissue and hard tissue).

Gingivectomy was done using surgical blade at 45 degree to the tooth in apico-coronal direction. In this case soft tissue was removed followed by bone removal with straight micromotor hand piece with a round bur along with copious irrigation.⁹ This was followed by refinement of crown margin and temporization (Fig5) was done. Then suturing was done using resorbable 000 vicryl suture. (Fig3,4) After 3 month of healing impression was made of the area followed by crown fabrication and placement.¹⁰ (Fig6)

RESULT

Patient was recalled for follow up after 4 weeks. On examination the gingiva was healthy and patient was very satisfied and happy with her smile.

DISCUSSION

Crown Lengthening is a surgical procedure that requires exposure of adequate tooth structure for successful prosthodontic rehabilitation where the clinical crown length is insufficient. The techniques and methods used for performing Crown Lengthening should be treated in such a way so as to avoid any violation to Biologic Width that can have deleterious effect on periodontium leading to gingival inflammation, loss of attachment and alveolar resorption. The goal of surgical crown lengthening is to provide the prosthodontist with sufficient clinical crown to achieve adequate retention for the prosthesis.¹¹

CONCLUSION

When a restoration is placed, the preservation of an intact, healthy periodontium is necessary to maintain the tooth being restored because improper management of the periodontal tissues during restorative procedures is a common cause of unsuccessful restoration. Surgical crown lengthening can be a viable option to facilitate restorative therapy or improving esthetic appearance when crown height is not sufficient. This surgery can be performed easily in routine dental practice.

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