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Case Report

Esthetic crown lengthening- A case series

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ABSTRACT:

Introduction: Crown lengthening is the process by which the extent of supragingival tooth structure is increased for aesthetic or functional (retention) purposes. **Method:** Various techniques are used for crown lengthening purpose. It is important to choose which technique should be employed for that patient. Techniques such as gingivectomy, flap with osseous reduction, apically positioned flap with or without osseous reduction have been used for crown lengthening procedure. **Case Report:** This article consists, series of 4 case reports highlighting its need according to the requirement and demand of the situation. **Discussion:** Crown Lengthening is a surgical procedure that requires exposure of adequate tooth structure for restorative procedures. The cases discussed here have been treated with various techniques and methods. All cases discussed here were 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.

Keywords: crown lengthening, biological width, gingivectomy, apically positioned flap

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INTRODUCTION

Esthetic Crown Lengthening is a surgical procedure done to increase the height of a clinically short crown to improve esthetics. The various causes of a short clinical crown include subgingival caries, tooth fracture, attrition, tooth malformation etc . Several techniques such as gingivectomy, apically repositioned flap with or without osseous reduction, and surgical extrusion have been proposed for clinical crown lengthening to increase the height of a clinically short crown.

OBJECTIVE

The main objective of an esthetic crown lenghtening procedure is to expose sufficient sound tooth structure in teeth with subgingival caries, tooth fracture etc.,to enhance retention of restoration/crown, adequate placement of margins of restorations without violating the biologic width, improved esthetics in patients with uneven gingival margin and excessive gingival display.To provide adequate tooth structure for placement of a restorative margin or a crown by creating a precise biologic width.

METHODOLOGY

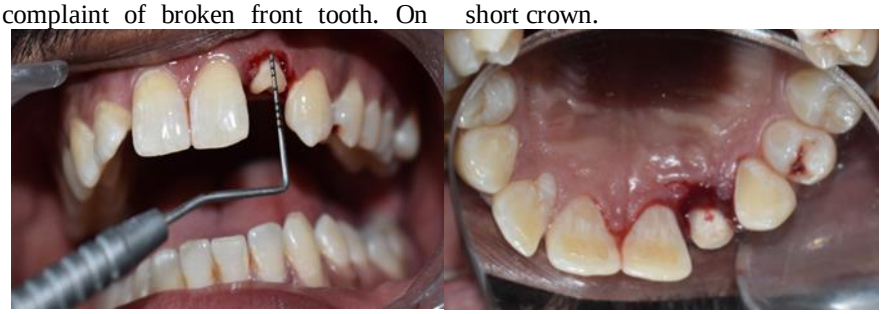
Cases referred to the Department of Periodontology with clinically inadequate short crowns were taken up for crown lengthening. Initial clinical examination included intra-oral periapical ragiograph examination, assessement of width of attached gingiva , assessment of crown-root ratio, pocket depth and mobility. Cases which had no periapical radiolucency , sufficient attached gingiva width (6-7 mm) , adequate crown-root ratio(1 :3) , pocket depth of 3mm or less, absence of mobility, were selected for crown lengthening.

Reduction of soft tissue /gingivectomy and flap surgery with/without osseous reduction was performed depending upon the width of attached gingiva and the amount of soft tissue coronal to the bone crest. For the osteotomy,osseous contouring was done using manual carbide burs with adequate

irrigation, for preventing bone necrosis and the flaps were sutured.

CASE1:GINGIVECTOMY DONE I.R.T. TOOTH NO.22

A 32 year old male patient came to the Department of Periodontology and Implantology, Baba Jaswant Singh Dental College and Hospital, Ludhiana, Punjab, with a chief complaint of broken front tooth. On clinical examination, a Probing Depth (PD) of about 5mm ,an adequate width of keratinized gingiva, a distance of cemento-enamel junction (CEJ) to bone was found to be ≥2mm. the patient was referred to the Department of Conservative Dentistry for Root canal treatment. After the R.C.T. was completed, a gingivectomy procedure was performed on both labial and palatal side to increase the height of the clinically short crown.



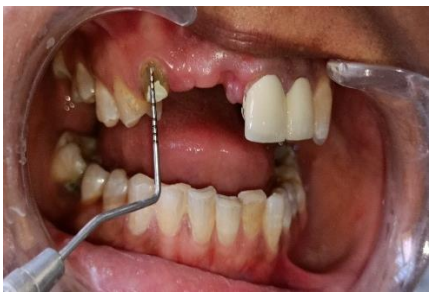
PRE-OP **POST-OP**

TECHNIQUE

On clinical evaluation, the location and thickness of the underlying bone was completed prior to beginning this procedure. The periodontal probe was used to perform bone sounding after administration of local anesthesia to rule out the necessity of osseous surgery. Pockets were marked using a pocket marker. Bard-parker blades no. 11 and 12, was used for the incisions on the facial surfaces. The incision was started apical to the gingival margin and was directed coronally. The incision was as close as possible to the bone without exposing it, to remove the soft tissue coronal to the bone. The incision was beveled at approximately 45 degrees to the tooth surface and should recreate as far as possible the normal pattern of the gingiva. The excess gingiva was removed with a Gracey curette , cleaned, and a post-surgical pack was placed. Patient was recalled after 7 days for removal of post-surgical pack, and then after 1month for follow-up. The increase in the extent of supragingival tooth structure was about 3mm throughout after 1month.

CASE 2: FLAP WITH OSSEOUS REDUCTION DONE I.R.T. TOOTH NO. 14

A 32 year old patient was referred for crown lengthening procedure to the Department of Periodontology and Implantology, Baba Jaswant Singh Dental College and Hospital, Ludhiana, Punjab. On examination PD was 4mm, the width of keratinized gingiva was Adequate KG(≥2MM); but the distance from FRM to bone <2mm. Hence flap procedure with osseous reduction was preferred.



PRE-OP

INTERNAL BEVEL INCISION **OSSEOUS CONTOURING USING A CARBIDE BUR**

The patient was carefully evaluated. Local anesthesia was administered and bone sounding was carried out.As the distance from the finished restorative margin to the alveolar bone was less than 2 mm, hence therewas need for osseous reduction.Internal bevel incision was given and a full thickness flap was reflected.For the osteotomy, the underlying bone was reducedusing a carbide bur to achieve a proper dimension of biological width and to expose the required tooth length in a scalloped fashion to follow the desired contour of the overlying gingiva. Ample irrigation with saline was done while doing osseous contouring to prevent bone necrosis.

The gingiva was recontoured using a castroveijoscissor and the flap was suturedback. The patient was recalled after 7 days for suture removal.The increase in the extent of supragingival toothstructure was about 1-2mm throughout after 1month.

CASE 3: APICAL POSITIONED FLAP WITH OSSEOUS REDUCTION DONE I.R.T. TOOTH NO. 12 AND 22

A 25year old male patient reported to the Department of Periodontology and Implantology, Baba Jaswant Singh Dental College and Hospital, Ludhiana, Punjab. with the chief complaint of broken front teeth due to trauma. Clinical examination revealedfractured teeth margins extending subgingivally. On examination the width of keratinized gingiva was inadequate, KG (<2MM), and the distance fromFRM to bone <2mm, hence an apical displaced flap with osseous reduction was preferred.

PRE-OP

INTERNAL BEVEL INCISION GIVEN

SUTURES PLACED

POST-OP

TECHNIQUE

An internal bevel incision was made to preserve as much of the keratinized and attached gingiva aspossible, the incision was no more than about 1mm from the crest of the gingiva and directed towards thecrest of the alveolar bone. Crevicular incisions were made, followed by the initial elevation of the flap and thenthe interdental incision were placed and the wedge of tissue formed was removed with a Gracey curette. An apical positioned flap was raised. The underlying bonewas reduced using a carbide bur with ample of irrigation with saline so as to achieve a proper dimension ofbiological width and to expose the required tooth length in a scalloped fashion to follow the desired contour of the overlying gingiva. The flap was displaced apical to its original position. The gingiva was recontoured using a pair of castroveijoscissors. Periosteal sutures were placed to prevent the further apical displacement of the flap andperiodontal pack was placed. Patient was recalled after 7 days for removal of sutures and periodontal pack andfor follow-up after 1 month. The increase in the extent of supragingival tooth structure was about 3mm.

CASE 4: APICAL POSITIONED FLAP WITHOUT OSSEOUS REDUCTION DONE I.R.T TOOTH NO. 11, 21

A 21 year old female patient reported to the to the Department of Periodontology and Implantology, Baba Jaswant Singh Dental College and Hospital, Ludhiana, Punjab with a chief complaint of unesthetic appearance of upper front teeth. On clinical examinationi.r.t. tooth no.11, 21, it was found that the

width of keratinized gingiva was inadequate, KG (<2MM)and the distance from or FRM to bone ≥2mm, hence an apically displaced flap without osseous reduction waspreferred.

PRE-OP

INTRA-OP

POST-OP

TECHNIQUE

The patient was carefully evaluated. Local anesthesia was administered and bone sounding was carriedout. Crevicular incision was given, followed by the initial elevation of the flap. As the distance from the finishedrestorative margin to the alveolar bone was more than 2 mm there was no need for osseous reduction. A full thickness flap was raised. The flap was displaced apical to its original position. Periostealsutures were placed to prevent the further apical displacement of the flap and periodontal pack wasplaced.Patient was recalled after 7 days for removal of sutures and periodontal pack.The increase in the extentof supragingival tooth structure was about 2mm.

RESULTS

Sufficient clinical crown height while maintaining adequate biologic width was achieved both through gingivectomy and flap surgery with/ without osseous reduction.

DISCUSSION

Crown lengthening is done to provide adequate restorative margins in teeth with subgingival caries or fractures or improving esthetic appearance. The esthetic crown lengthening requires gingivectomy procedures to expose the crown portion of the tooth, therefore, a minimum of 2 to 5 mm of keratinized tissue is necessary to ensure the gingival health. Moreover, the management of the papilla is another important aspect of the surgery. The interproximal bone should be carefully removed in order to maintain the anatomic structures, so that the interproximal tissues are allowed to coronally proliferate; the papilla should replace the distance from the bone crest to the base of the contact area (about 5 mm or less). Any smaller residual interproximal space can be eliminated by apically positioning the contact area of the definitive restoration. To have a harmonious and successfully long-term restoration, the distance between the crestal bone and prosthetic margins, which allows recreating the biological width, should be at least 3 mm. This can be surgically achieved by crown lengthening, as presented in the above case series.

Studies suggest that the biologic width re-establishes itself after crown lengthening procedures, in 6 months. However, to plan the required technique of crown lengthening procedure, a complete periodontal assessment of patients should be done. An accurate diagnosis and interdisciplinary approach is mandatory for obtaining improved, conservative, and predictable results in esthetic areas.

CONCLUSION

Subgingival restorative margins induce periodontal inflammation through impingement of the margins on the attachment apparatus. Estheticcrown lengthening is a very useful procedure to restore both esthetics and function and to prevent biologic width violation.

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