

Crown lengthening: an approach towards rehabilitation of fractured tooth

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ABSTRACT

Sound restorative margins are imperative to the success of restoration. Crown lengthening procedures play an important part in the restorative procedures and are utilized to enhance the appearance and retention of restorations. This case report describes the rehabilitation of a fractured tooth with crown lengthening and post-core.

Keywords: crown lengthening, biologic width, periodontium

INTRODUCTION

The location of restorative margins is important for maintaining the health of periodontal tissue(1). Margins of a restoration must not compromise the biologic width. Sometimes, the margin placement at the desired location may not be possible due to loss of coronal tooth structure. Crown lengthening aims to achieve the dimension of tooth restoration adequate for a stable dento-gingival complex, providing adequate placement of a restorative margins. This is done to achieve better aesthetic results and adequate marginal seal. A supragingival crown margin is considered the most beneficial in terms of periodontal health, while subgingival margins lead to initiation and progression of periodontal disease (2). This initiation of periodontal inflammation followed by progressive tissue loss seems to be related to violation of Biologic width(2).

The biologic width is defined as the physiologic dimension of the junctional epithelium and connective tissue attachment (3). The average width of connective tissue attachment is 1.07 mm above the alveolar bone crest, and a junctional epithelium 0.97 mm wide under the base of the gingival sulcus. The combination of these two measurements was defined as the biologic width found to be 2.04 mm in average. Physiologically, biologic width functions as a barrier for the subjacent periodontal ligament and the supporting alveolar bone (4). Crown lengthening is a surgical procedure to increase the dimension of available supragingival tooth structure for restorative or esthetic purposes by apical positioning of the gingival margin, removing supporting bone or both (5).

CASE REPORT

A 42-year-old female patient reported to the department of conservative dentistry and endodontics, Post Graduate Institute of Dental Sciences, Rohtak with a chief complaint of fracture of crown restoration of lower left back region 1 day back. Patient gave history of endodontic treatment and crown restoration 2 years back. Clinical examination revealed remnant intact tooth structure surrounded by healthy gingiva and absence of mobility (Fig.1). Periodontal probing did not reveal loss of attachment. Radiographic examination revealed healthy bone around the remnant tooth structure without any interdental bone loss and presence of root canal filling material in the apical third of root suggestive of post space being prepared (Fig.2). Radiograph revealed normal periapex and good apical seal. Considering the structural integrity of root and healthy periodontium it was decided that surgical crown lengthening would provide for adequate tooth structure to support a post and core over which a permanent restoration would be placed. Risks of the surgical procedure and alternative treatment options were explained to the patient and hence an informed consent was obtained.



Fig.1: Pre-operative photograph



Fig. 2: Pre-operative radiograph

After the administration of Local anesthesia and surface disinfection, transgingival probing was performed around the tooth 34 and 3 mm of soft tissue was present above the alveolar crest. A UNC-15 periodontal probe was used for making indentations as a guide to mark the apical extent of gingival incision. Using a no. 15 Bard-Parker blade, the initial internal bevel incision was performed 3 mm below the gingival margin so as to achieve the ideal contour, following which, a full thickness mucoperiosteal flap was raised. Residual gingival tissue was then excised and sufficient amount of attached gingiva was present to give a remaining 2 mm around the restoration. Flap reflection revealed sound interdental bone with normal osseous topography (Fig. 3). Osseous resection was performed using low speed handpiece and carbide bur under copious saline irrigation to maintain the biologic width and the flap was repositioned and sutured (Fig 4, 5). 0.2% chlorhexidine rinse was prescribed for 2 weeks, and the patient was given appropriate postoperative instructions. Sutures were removed 7th day post-surgery. Post-surgical clinical examination revealed satisfactory soft tissue healing with primary wound closure.



Fig.3 Flap reflection after gingivectomy



Fig. 4: bone reduction



Fig. 5: suture placement

After proper irrigation with sodium hypochlorite, the post space was refined with no. 3 peeso reamer. The canals were irrigated and dried thoroughly. Fibre post was luted and core build-up was done using composite resin. The crown preparation was done and restorative margins were refined for a porcelain-fused to metal crown. Impressions were made using putty wash technique. The crown was cemented in place. Post-operative radiograph was taken (Fig. 6).



Fig. 6: Post-operative radiograph

DISCUSSION

Adequate biologic width must be preserved to maintain a healthy periodontium. A minimum of 3mm space must exist between the restorative margins and the crest of alveolar bone to allow for 2mm of biologic width and 1 mm of sulcus depth (6). For optimal gingival health, an adequate width of attached gingiva should be maintained (7). In this case a supragingival margin was placed. When the restoration margin is placed too far below the gingival tissue crest, it impinges on the gingival attachment apparatus and creates a violation of biologic width. In this case, an internal bevel

incision was given to maintain the periodontal health and postoperative esthetics of the patient. This incision thins down the gingival margin to a knife edge contour and preserves the maximum amount of attached gingiva.

The length and shape of root, furcation position, interdental bone width, soft/hard tissue anatomy, and muscle and the amount of attached gingiva must be taken into consideration. After treatment completion, a favourable crown: root ratio was maintained in this case.

The health of the periodontal tissues is dependent on properly placed restorative margins. Overhanging restorations and open interproximal contacts must be corrected. In ideal clinical conditions, crown lengthening gives satisfactory results both from a functional as well as esthetic point of view.

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