

## Conservative Treatment Approach for Management of Fractured Maxillary Canine with Surgical Crown Lengthening and Post Core Restoration

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### Case Report

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**Abstract:** Perpetual preservation of what is remaining is more important than meticulous reconstruction of what is lost. Preservation and restoration of badly carious or broken tooth possess problems due insufficient remaining tooth support supragingivally and it demands skills and knowledge on different aspects of dentistry. Clinical crown lengthening procedure aim to increase supragingival tooth structure to help in restoration of such teeth. Present report describes preservation of broken tooth with surgical crown lengthening and post core restoration.

**Keywords:** Management, Maxillary canine, Fracture.

### INTRODUCTION

With the advancements in every direction in dentistry there are many available treatment options for a single dental problem. So it is up to dentist to choose appropriate treatment plan. Though, dental implants open new gates for replacement of teeth, we should not forget golden statement by De Van; "Perpetual preservation of what is remaining is more important than meticulous reconstruction of what is lost." Preservation of badly carious or broken tooth demands skills and knowledge on different aspects of dentistry. Restoration of such tooth often pose problems due to insufficient remaining tooth structure supragingivally. Clinical crown lengthening procedure aim to increase supragingival tooth structure to help in restoration of such teeth[1]. Present report describes preservation of broken tooth with surgical crown lengthening and post core restoration.

### CASE REPORT

A 41-year-old male was referred & reported with fractured maxillary left canine (#23) (Figure 1). Patient was otherwise having good general health without any history of systemic illness. Clinical examination revealed fractured 23 with minimal remaining crown structure. Neither periodontal problems nor tooth mobility was detected. Sulcus depth was less than 3mm circumferentially. No periapical radiolucency at radiographic examination was detected, the periodontal ligament was within normal limit and the crown-to-root ratio was about 1:3. The primary concern of this patient was to save his tooth with satisfactory esthetic outcome. Patient was informed about the treatment and a written consensus was obtained according to local legislation. Root canal treatment was performed under multiple sittings over a week before proceeding for surgical crown lengthening.

After anesthetizing area to be operated interdental incisions were performed, and the wedge of

tissue that contains the pocket wall was removed. Vertical incisions were then made extending beyond the mucogingival junction (Figure 2 and 3). Full thickness flap was elevated by blunt dissection with a periosteal elevator (Figure 4). After removal of granulation tissue and thorough debridement, osseous reduction was performed using handpiece and burs with copious normal saline irrigation (Figure 5 and 6). Positive osseous architecture was established before displacing the flap apically and periosteal suturing was done using 4-0 black braided silk (Figure 7). A dry foil was then placed over the flap before covering it with the dressing to prevent the introduction of pack under the flap (Figure 8). Post operative instructions were given including maintenance of oral hygiene. Sutures were removed after 7 days. Follow-up appointments occurred weekly for a month followed by monthly intervals till final restoration given (Figure 9 and 10). Final full cast restoration was given after six months (Figure 11).



**Fig-1: Preoperative view of fractured maxillary canine**



**Fig-2: Placement of incision (buccal view)**



**Fig-3: Placement of incision (Palatal view)**



**Fig-4: Elevation of flap**



**Fig-5: After osseous reduction (Buccal view)**



**Fig-6: After osseous reduction (Palatal view)**



**Fig-7: Suture in place**



**Fig-8: Periodontal pack in place**



**Fig-9: Postoperative view (After 1 month)**



**Fig-10: Postoperative view after post placement**



**Fig-11: Placement of permanent crown**

## DISCUSSION

The concept of clinical crown lengthening was first introduced by D.W. Cohen [9]. The amount of tooth structure exposed above the osseous crest must be enough to provide sufficient sound tooth structure for placement of restoration as well as for stable dentogingival complex and biologic width around tooth [2].

The indications for surgical crown-lengthening include esthetic enhancement, exposure of subgingival caries, exposure of fracture or some combination. Crown-lengthening surgery has been categorized as esthetic or functional depending upon the purpose for which it has been performed. The term “functional” relates to exposure of subgingival caries, exposure of a fracture or both. While, esthetic crown lengthening was

carried out in case of excessive gingival display in medium or a high lip line or if the patient desires an anterior dentition that is more normal in tooth length [2,3].

Several techniques such as; gingivectomy, apically repositioned flap with or without osseous reduction, orthodontic forced eruption with or without fibrotomy have been proposed for crown lengthening. Selection of a technique depends on various patient related factors such as; esthetic, clinical crown to root ratio, root proximity and morphology, tooth position, amount of attached gingiva and sulcus depth around tooth to be treated.

Here, apical repositioned flap was used rather than gingivectomy as osseous reduction is required to

maintain post operative biologic width. In present case osseous reduction is performed in such a way that 4-5 mm of tooth structure would remain supracrestal circumferentially, which maintains biologic width postoperatively as well as provides ferrule effect.

A review of the literatures revealed differing opinions regarding the occlusoapical length of the biological width. Gargiulo and colleagues reported the average length of the dentogingival junction is 2.04 mm that includes two subcomponents the connective-tissue attachment (mean value: 1.07 mm) and the epithelial attachment (mean value: 0.97 mm)[4]. Vacek and colleagues reported mean values of for the connective tissue and epithelial attachment were 0.77 mm and 1.14 mm respectively by their study in human cadaver specimens [5]. While, Ingber and colleagues suggested that average value of the dentogingival junction is approximately 2 mm. They further suggested that an additional 1 mm be added coronal to the 2 mm dentogingival junction as an optimal distance between the bone crest and a restorative margin [6]. In contemporary dental practice, 3-mm distance is preferred as significantly reduce the risk of periodontal attachment loss induced by encroachment of subgingival restorative margins. Placing the restoration in close proximity to the osseous crest alters periodontal health and predispose to chronic inflammation.

Preserving intact coronal and radicular tooth structure and maintaining cervical tissue to create a ferrule effect are crucial factors to optimize the biomechanical behavior of the restored tooth. A ferrule effect is defined as a “360° metal collar of the crown surrounding the parallel walls of the dentine extending coronal to the shoulder of the preparation. The result is an elevation in resistance form of the crown from the extension of dentinal tooth structure”. The presence of a 1.5- to 2-mm ferrule has a positive effect on fracture resistance of endodontic ally treated teeth. If clinical situation does not permit a circumferential ferrule, an incomplete ferrule is considered a better option than a complete lack of ferrule *at el.*[7].

Higher tendency for reduction in crown length due to postoperative tissue rebound was noted following first three months of crown lengthening surgery [8]. Thus, final restoration was placed 6 months after crown lengthening procedure to minimize effect of postoperative tissue rebound and to allow establishment of biologic width following surgery.

## CONCLUSION

Crown lengthening procedure is effective and viable treatment option for preservation and restoration of broken and badly carious teeth and it will provide good treatment outcome both esthetically as well as functionally when selected under favorable clinical conditions.

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