Case Report

Dentistry Section

Clinical Crown Lengthening by Surgical Extrusion: A Case Report

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ABSTRACT

Aesthetic considerations have influenced the management of dental maladies in varying degrees for many years. The patient awareness and expectations have increased recently to the point that less than optimal aesthetics are no longer an acceptable outcome. An essential goal of the treatment is the long-term stability of the result; for this to be achieved, the integrity of the dentogingival junction must be respected, and the dental restorations and the periodontium must be in harmony. This case report deals with root canal treatment of the fractured tooth, followed by atraumatic extrusion of the tooth by using a periotome and stabilization of the tooth to a required level by temporary splinting, followed by its final restoration. The outcome of the treatment within a short duration has very good aesthetic results.

Key Words: Dental, Tooth, Aesthetics

INTRODUCTION

Clinical crown lengthening can be performed by a variety of techniques and all of them have some limitation in terms of the function and aesthetics. In this case report, we have dealt with the clinical and radiographic results of a surgical extrusion technique for clinical crown lengthening. Atraumatic surgical extrusion by using a specially designed instrument (periotome) was performed in this case, in which it was expected that extensive resective osseous surgery would have to be used for the crown lengthening. After endodontic therapy, the tooth was carefully luxated and extruded to the desired position without damaging the marginal bone area or the root apex. A non-rigid splint was applied and it was removed in 2 weeks, followed by crown preparation and restoration. Clinical and radiological examinations were performed at 3 months and 6 months post restoration. The tooth functioned normally, with no periodontal pocket or mobility. The radiographic examination revealed a normal periodontal contour which was consistent with new bone formation in the periapical area. The radiographic analysis did not show any evidence of root or crestal bone resorption or endodontic problems. This technique could be performed as an alternative surgical approach for crown lengthening, as it does not induce functional or aesthetic deformities, especially in the anterior region. Clinical crown lengthening has been described as a common periodontal surgical procedure which can be used for the following objectives: exposure of sufficient sound tooth structure in cases of deep, sub-gingival, carious lesions and tooth fractures, enhancement of the retentive quality of the restorations, correct placement of the margin of the restorations without violating the biological width, and improved aesthetics in patients with uneven gingival margins and excessive gingival display [1,2].

Some techniques have been proposed for clinical crown lengthening, such as gingivectomy, an apically positioned flap with or without osseous surgery, and orthodontic forced eruption with or without fibrotomy [2]. The selection of one technique over another depends on several patient-related factors: (a) aesthetics, (b) the clinical crown to-root ratio (c) root proximity, (d) root morphology, (e) furcation location (f) individual tooth position, (g) collective tooth position, and (h) ability to restore the teeth [3,4,5].

CROWN LENGTHENING BY SURGICAL EXTRUSION

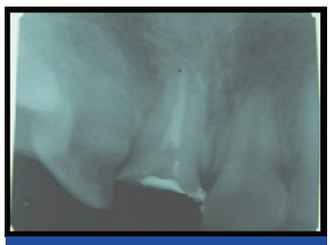
- To treat teeth with deep cervical root fractures and deep cervical root caries that are difficult to treat conservatively, the surgical extrusion technique has been proposed, with predictable short- and long-term results [6].
- Aesthetic requirements for maintaining the gingival margin after the crown lengthening procedure in a single anterior tooth [7].

CASE REPORT

The patient's medical history was reviewed to rule out any local or systemic diseases that could contraindicate the surgical procedures. Careful clinical and radiographic evaluations were performed prior to the surgical procedure for the sake of the case selection. Surgical extrusion was performed only when extensive resective osseous surgery was expected to be required. Following local anaesthesia (lidocaine 2% with 1:80,000 epinephrine), an intra-sulcular incision was made around the teeth. The distance from the tooth fracture margin to the surrounding marginal bone was measured with a periodontal probe to calculate the amount of extrusion which was necessary.

The tooth was carefully luxated to avoid damage to the marginal bone area or the root apex of the tooth which had to be treated. For this purpose, the blade of a Periotome (Aesculp) was placed into the periodontal ligament (PDL) space of the tooth which had to be treated. The Periotome was manipulated in the PDL space of the tooth in a "walking motion" to luxate the tooth without inducing surgical trauma. After careful luxation, the tooth was extruded to the desired position by using a haemostat as atraumatically as possible, to protect the vital PDL. A non-rigid splint was applied.

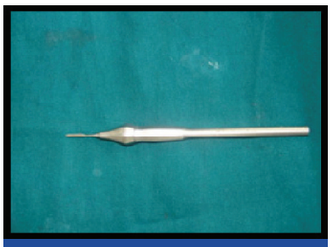
[Table/Fig-1]: Initial Profile



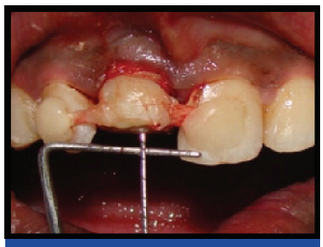
[Table/Fig-2]: Root Canal Treated Tooth

[Table/Fig-3]: Prior to Extrusion Planning Both the Horizontal and Vertical Distance Measurement

[Table/Fig-4]: Sulcular Incision



[Table/Fig-5]: Periotome



[Table/Fig-6]: Extrusion Using Periotome and Bonding with Composite to Adjacent Tooth

Radiographic and clinical examinations were performed to assess the changes in periapical and periodontal healing, probing depth, and tooth mobility.

DISCUSSION

The evaluation of periodontal repair on transplanted or surgically extruded teeth usually shows slight marginal bone and apical root resorption [8]. Since we employed a periotome which was specially designed for a traumatic extraction or luxation, the root never left the socket during the surgical manipulation, thus minimizing the risk of dehydration of the PDL [8]. The tooth mobility was minimal after 4 weeks and no endodontic problems could be found as the root canal treatment was performed before the surgery. The fixation of the extruded teeth was accomplished only by means of a fiber reinforced splint to allow some mobility, throughout the healing period [9]. A clinically stable mobility of the extruded teeth was present within the first month and it was maintained during the observation period. The non-rigid fixation which was used had a positive influence on the healing [10]. However, the clinical findings which are presented here suggest that this protocol offers several advantages over the conventional surgical approaches.

[Table/Fig-7]: Removal of Composite to Evaluate the Extrusion Achieved After 2 Weeks

[Table/Fig-8]: Radiograph Showing Bone Regeneration Periapically

[Table/Fig-9]: Six Months Review

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