

Case Report

MANAGEMENT OF SUBGINGIVAL ROOT FRACTURES- A NEW APPROACH TO ORTHODONTIC EXTRUSION: A CASE REPORT

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ABSTRACT:

Background: The management of subgingival root fractures requires an integrated interdisciplinary treatment approach that addresses functional, esthetic and biologic factors. Extrusion of root fragment is indicated in order to provide a sound tooth margin for full coverage restoration in conjunction with the adequate, easily maintainable biological width. In the present case, a 31-year-old male patient reported with fractured upper right central incisor following road traffic accident and the horizontal cervical fracture was found to extend below the gingival margin. The treatment plan included endodontic treatment followed by orthodontic extrusion using E chain and lingual buttons placed on facial surface of concerned tooth and adjacent teeth before permanent crown placement. **Aims:** To describe the management of subgingival root fractures by employing lingual buttons and E chain for orthodontic extrusion of root fragment.

Key words: orthodontic extrusion, subgingival root fracture, lingual buttons, E chain.

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INTRODUCTION

The teeth with subgingival root fractures were either extracted or periodontally exposed in order to provide a better prognosis to such teeth. The periodontally exposed teeth however, provided long and unesthetic clinical crown. It was only after the pioneering work by Heithersay¹, who advocated the technique of orthodontic extrusion for management of such traumatic injuries to the teeth in the esthetic region of the face, that an effective stop to extraction or periodontal crown lengthening was established.

Orthodontic extrusion provides a sound tooth margin for full coverage restoration in conjunction with the adequate, easily maintainable biological width. A minimum distance of 3 mm is required from the restorative margin to alveolar crest to provide a

biologically acceptable restoration of teeth and to permit adequate healing^{2, 3}. In the present case, the traumatized maxillary central incisor with subgingival crown fracture was managed by orthodontic extrusion with the help of E-chain and lingual buttons prior to full coverage restoration in order to maintain healthy periodontal tissue and alveolar bone.

CASE REPORT

A 31-year-old male patient reported to the Department of Conservative Dentistry and Endodontics, with fractured upper right central incisor following road traffic accident. Clinical examination revealed horizontal cervical fracture of upper right central incisor (11) extending below the gingival margin (Fig. 1a). So an orthodontic extrusion of the incisor was planned to

restore the physiological periodontal attachment. The procedure was explained to the patient and informed consent obtained.

Root canal treatment was carried out and an apical sectional root filling was done. Next, lingual buttons were placed on the labial aspect of both central incisors and right lateral incisor. E-chain was placed on these lingual buttons (Fig. 1b). E-chain produced the traction forces on the fractured fragment. After 2 weeks, extrusion of approximately 3 mm was clinically (Fig. 1c) and radiographically evident (Fig. 2a, 2b). Clinically it can be appreciated by the level of gingiva and the E-chain (Fig. 1c, 1d, 1e).

In order to prevent relapse of the extruded tooth, it was stabilized for a period of 2 weeks. After the stabilization period, sulcular incision was given and a definite coronal restoration was planned. The fractured tooth was restored with a custom cast post and core (Fig. 2c) and a full ceramic fused to metal crown (Fig. 1f, 2d). The left central incisor with Ellis class II fracture was restored with resin composite (Fig. 1f).

Figure 1: Clinical



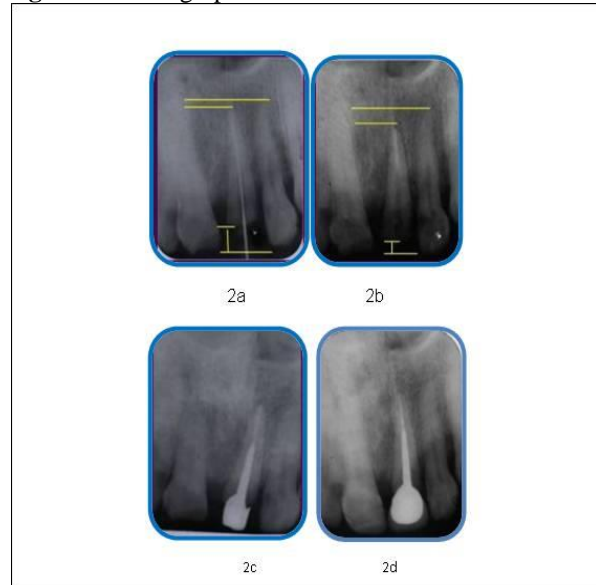
DISCUSSION

Loss of tooth tissue in the anterior region in a young patient may create severe esthetic and emotional problems⁴. It is important to retain the natural tooth as long as possible though implants also provide promising results. There are various treatment guidelines and options available for management of complicated crown fractures.

The treatment modality chosen depends mainly upon the location and extent of the fracture. Subgingival crown fractures are challenging in terms of coronal rehabilitation⁴. In such cases, the treatment should be aimed at exposing the fractured margins in order to achieve strict moisture and haemorrhage control for the

subsequent clinical procedures. Moreover, the prognosis may be improved further through better plaque control by the patient⁵. It has been suggested that orthodontic and surgical extrusion provide promising results,^{4, 6} nevertheless orthodontic extrusion is more conservative approach in comparison to surgical extrusion and crown lengthening.

Figure 2: Radiographic



Orthodontic extrusion has been referred to as vertical extrusion, forced eruption, orthodontic eruption or assisted eruption^{1, 7}. The technique restores the physiological periodontal attachment and preserves alveolar bone^{7, 8}. It facilitates prevention of periodontal breakdown that is liable to occur if margins of restoration impinge on biological width. Extrusion can be achieved either with the help of removable or fixed orthodontic appliances.^{1, 8}

In the present case, orthodontic forces were applied using E-chain. The use of E-chain and lingual buttons on facial surface of adjoining teeth for the purpose of orthodontic extrusion has not been reported earlier.

In order to prevent the relapse of extruded tooth, gingivoplasty or sulcular incision has been reported.^{8, 9} In this clinical report, a treatment modality for forced eruption that minimizes treatment time and increases ease of use was described. The technique employed the use of E-chain and lingual buttons on the facial surface of concerned tooth as well as the immediately adjacent teeth for the purpose of orthodontic extrusion. The use of this technique for forced eruption may help have a better esthetic result and better patient appreciation.

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