



## Case Report

# Surgical extrusion of multiple teeth with crown-root fracture rehabilitated by richmond crown: A case report

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## ABSTRACT

This case study discusses the use of surgical extrusion as a tangential treatment plan for an upper incisor fracture. A male patient of 20 years old who had fractures to his maxillary anterior teeth came to our department. The teeth were cracked due to a violent injury. The root canal treatment of teeth was done prior to being surgically extruded. In order to minimize injury to the marginal alveolar bone, atraumatic surgical extrusion of the teeth was carried out by softly luxating and extruding to the ideal position. A semi-rigid splinting was done for 2 weeks and complete restoration involving a Richmond crown was set after 6 weeks.

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## 1. Introduction

Foremost teeth fracture are the most well-known sort of dental injury. Crown-root fractures (CRFs) are normal in dental specialists' everyday practices. CRFs are characterized as fracture including the enamel, dentin, and cementum. Surgical extrusion, also referred to as intentional implantation, intra-alveolar transplantation, or intra-alveolar repositioning, is the process of repositioning the remaining tooth structure back into the original socket of the tooth, placing at a more coronal or supra-gingival position.<sup>1</sup> Its establishment is the idea of moving the damaged tooth to a supra-gingival position, exposing healthy tooth structure to enhance tooth restorability and creating room for the biological width to re establish.<sup>2</sup> For a really long time, Richmond Crown has successfully utilized post and center treatment in circumstances where the tooth's remaining design is deficient to support a significant prosthetic crown.<sup>3</sup>

## 2. Case Presentation

A male patient, age 20, arrived at the department with trauma involving his upper anterior teeth. 11, 12, 13, and 21 were fractured when the patient first showed up. Pulp was involved and there were no coronal fragments present, and the fracture line on 11 and 12 could be seen labially and extending subgingivally palatally in oblique direction. A clinical assessment uncovered absence of supra-gingival sound tooth structure, making it difficult to accomplish the ferrule effect and forestalling the performance of a predictable and dependable long-lasting restoration (Figure 1). The long rooted teeth without root fracture and apical radiolucency, were noticeable on the radiograph (Figure 2). The following stages was to analyze the radicular length and the width of surviving radicular and coronal walls and to consider the different treatment decisions to save the tooth. Following a thorough assessment, it was resolved that a surgical tooth extrusion would be necessary to create a healthy supragingival sound structure and provide the patient with a trustworthy long

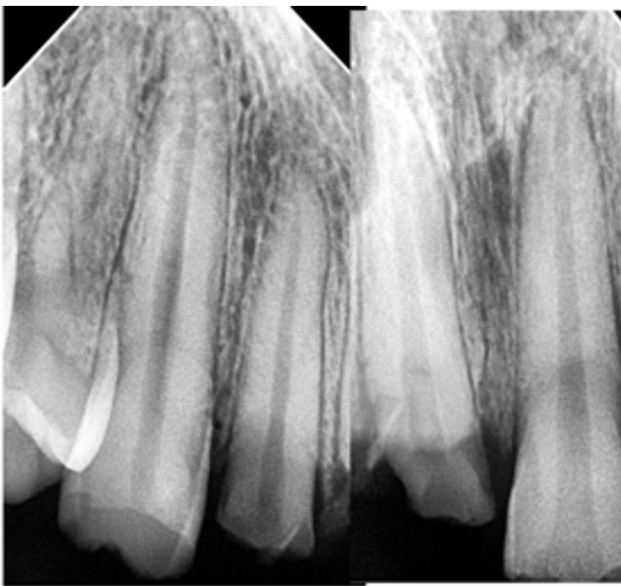
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haul course of care.



**Figure 1:** Preoperative image



**Figure 2:** Preoperative radiograph

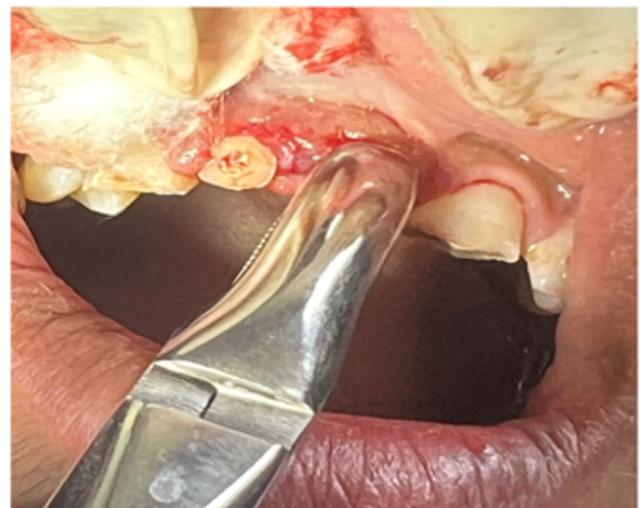
The following clinical procedures were carried out: endodontic treatment was first finished for every one of the four teeth before surgical extrusion. Intracanal irrigation with 5.25% NaOCL and 17% EDTA as a final irrigation, canal preparation was completed. Using the lateral condensation procedure, the canal was dried and filled with gutta-percha and root canal sealant. For 11 and 12, post-obturation and post-space preparation was made. Prior to performing the surgical extrusion operation, the region was cleaned with mouthwash containing 0.12% chlorhexidine. Local anesthesia was then applied using 2% lidocaine. The tooth luxation procedure was performed using a fine elevator.

Without inflicting any surgical stress, it was positioned in the periodontal space and moved in a walking manner around the tooth. The tooth was luxated by applying luxating forces at the initial 3-5 mm of the radicular

structure using a fine elevator to avoid injuring the periodontal ligament, which will stay in an infra-bony position. Following that, the tooth was extracted from the socket and extruded about 4 mm (Figures 3 and 4). A slight pressure was applied in a bucco-palatal direction, using a gauze, to obtain hemostasis and to keep the tooth in the right position.



**Figure 3:** Obturation & post preparation space



**Figure 4:** Surgical extrusion

A two-week semi-rigid splint made of composite and ligature wire was done (Figure 5). For two weeks, the patient was told to rinse their mouth with 0.2% chlorhexidine.



**Figure 5:** Splinting

Two weeks later, the splinting was Removed. Green inlay wax was utilized for the post space impression of teeth 11 and 12 after six weeks, when the extruded tooth mobility was clinically acceptable (Figure 6). Metal try-in was done after cast post and core fabrication. A radiograph was used to verify the post fit [Figure 6]. A special cast porcelain core and post (a Richmond crown) was made for 11 (Figure 7). The final crowns were placed and the occlusion was corrected. The high points were identified and amended. The final cementation was done using GC Japan's Type I glass ionomer cement. (Figure 8)



**Figure 6:** Custom cast post

### 3. Discussion

Periodontal deterioration may result from restorative techniques that compromise biologic width.<sup>4</sup> In order to offer sufficient ferrule and enable restorability, the enduring root in the socket is deliberately moved to a more coronal position during surgical extrusion, often referred to as intra-alveolar transplanting.<sup>5</sup> The alveolar bone and the PDL of the root surface will be to some degree traumatized by extraction techniques utilizing luxators and periostomes, which will raise the possibility of replacement root resorption.<sup>6</sup>

In 1878, the Richmond crown was first made available. Ferrule collars are utilized to increase mechanical resistance and retention in addition to their anti-rotational impact. When the maximum quantity of tooth structure had been removed and more tooth preparation was not required.<sup>7</sup>



**Figure 7:** Richmond crown



**Figure 8:** Post operative image

Richmond crowns were strongly recommended. Clinical crown lengthening using a minimally traumatic controlled surgical extrusion technique produced very positive results in terms of both aesthetic and functional aspects.<sup>8</sup>

### 4. Conclusion

Maintaining the biologic width is an important consideration for the practitioner. If the tooth has a taper and root length that are advantageous, surgical extrusion is one of the greatest options for lengthening the crown in the aesthetic regions of a single tooth. This surgical method yields very predictable outcomes in terms of both function and appearance, particularly in the anterior region, when paired with contemporary adhesive techniques and the newest generation of materials.

### 5. Source of Funding

None.



## 6. Conflict of Interest

None.

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