

## INTRODUCTION

### Crown-root fracture

- A fracture comprising enamel, dentin, and cementum
- Pulp involvement
  - Uncomplicated
  - Complicated
- Prevalence
  - 0.5 – 5% in permanent teeth
  - among all traumatic dental injuries
- In cases of extensive tooth fracture, restorative margins need to be placed apically to the gingival margin. Violation of the **biological width** due to dental trauma frequently appears in clinical practice.
- Treatment options for preservation of biological width and ferrule effect; **crown lengthening, orthodontic extrusion, and surgical extrusion.**
- This case report describes the surgical intervention and fixed prostheses on crown-root fractured maxillary incisors in a growing patient.

## CASE REPORT

- **The purpose** of this report is the surgical intervention for severely crown-root fractured maxillary incisors in a growing patient.
- **Patient information**
  - A 14-year old
  - Korean boy
  - No underlying disease
  - Got hit with a baseball bat
- **Chief complaint**
  - Crown- root fracture with pulp exposure on upper right central and lateral incisor
  - A vertical fracture line extended below gingival margin
- **Treatments**
  - #12, 11 Conventional endodontic treatment, Post & core
  - Surgical extrusion & Surgical crown lengthening
  - Final restoration with PFM crowns

## PRE-TREATMENT

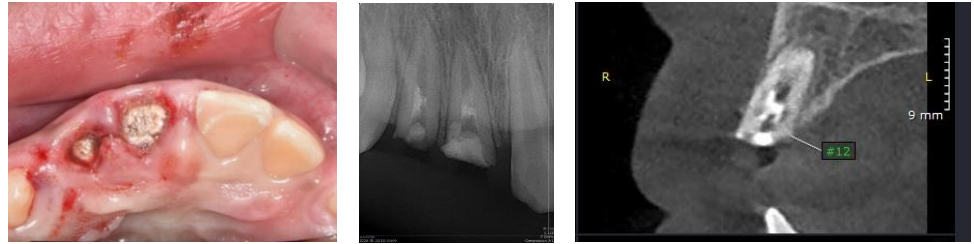


Fig 1. The maxillary right central (#11), lateral incisors (#12), and left central incisor (#21) were fractured. The margins of the fractures were extended apically to the gingival margin and periodontal ligament (PDL) space widening were observed on the both incisors.

## SURGICAL EXTRUSION & CROWN LENGTHENING PROCEDURE



Fig 2. Clinical crown lengthening procedure was performed to level the gingival line and to expose sufficient sound tooth structure for a subsequent prosthesis.

## OUTCOMES

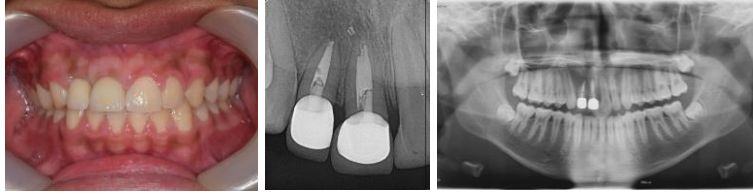


Fig 3. 1-year follow up. The patient was successfully rehabilitated with porcelain-metal fixed prosthesis.

## DISCUSSION

- The dentist may be required to excise both hard and soft tissue to facilitate development of a biological width of 3 mm, as well as a ferrule length of 1.5 mm.
- **Ferrule effect**
  - A 360-degree metal collar of the crown surrounding the parallel walls of the dentin extending coronal to the shoulder of the preparation
  - It provides resistance form of the crown and protective effect.
- **Crown lengthening procedure**
  - The tooth preparation can extend more apically for 1 to 2 mm.
  - The crown does not invade the attachment apparatus; a more predictable prosthetic outcome is facilitated.

## SUMMARY

- In cases of extensive caries, tooth fracture, dentinal hypersensitivity, inadequate crown length, and increased esthetic demands, restorative margins need to be placed at or apical to the gingival margin.
- These subgingivally placed restorations have been associated with gingival inflammation, loss of connective tissue attachment, and bone resorption.
- Surgical extrusion and crown lengthening might be considered as utmost treatments to save the tooth instead of the coronectomy or extraction for a severely fractured tooth.
- The key factors in a successful functional and esthetic rehabilitation of complicated crown fracture and crown-root fracture are multidisciplinary approaches, which involves surgeries, endodontics, periodontics, orthodontics and prosthodontics.