

# Management of Horizontal Root Fractures: A Multidisciplinary Approach

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# UConn HEALTH

## INTRODUCTION

- 14-year-old male patient presents to Connecticut Children's Medical Center Emergency Department (CCMC ED) after sustaining trauma to teeth #8 and #9 at school, resulting in horizontal root fractures.

### INITIAL EXAM


- Root fractures of teeth #8 and #9 at apical 1/3 of root. Coronal fragments laterally luxated towards palate.
- Deep gingival laceration on buccal aspect of tooth #9. No buccal bone visualized.
- Deep laceration to labial mucosa of upper lip.
- Teeth #7 and #10 WNL. No mobility, no fractures.
- No injury to lower lip or mandibular incisors.

### INITIAL PHOTOS & RADIOGRAPHS



### EMERGENCY TREATMENT WITH PEDIATRIC DENTISTRY

- Splinting performed following the International Association of Dental Traumatology Guidelines for the Management of Traumatic Dental Injuries:

Root fracture	Treatment
 <p>A fracture of the root involving dentin, pulp and cementum. The fracture may be horizontal, oblique or a combination of both.</p>	<ul style="list-style-type: none"><li>If displaced, the coronal fragment should be repositioned as soon as possible.</li><li>Check repositioning radiographically</li><li>Stabilize the mobile coronal segment with a passive and flexible splint for 4 wk. If the fracture is located cervically, stabilization for a longer period of time (up to 4 mo) may be needed</li><li>Cervical fractures have the potential to heal. Thus, the coronal fragment, especially if not mobile, should not be removed at the emergency visit</li><li>No endodontic treatment should be started at the emergency visit</li></ul>

- Splint completed at CCMC ED approximately 3 hours after initial injury.
- Splint rebounded 5 days later at CCMC ED due to resin composite failure and to aide in tooth stabilization.



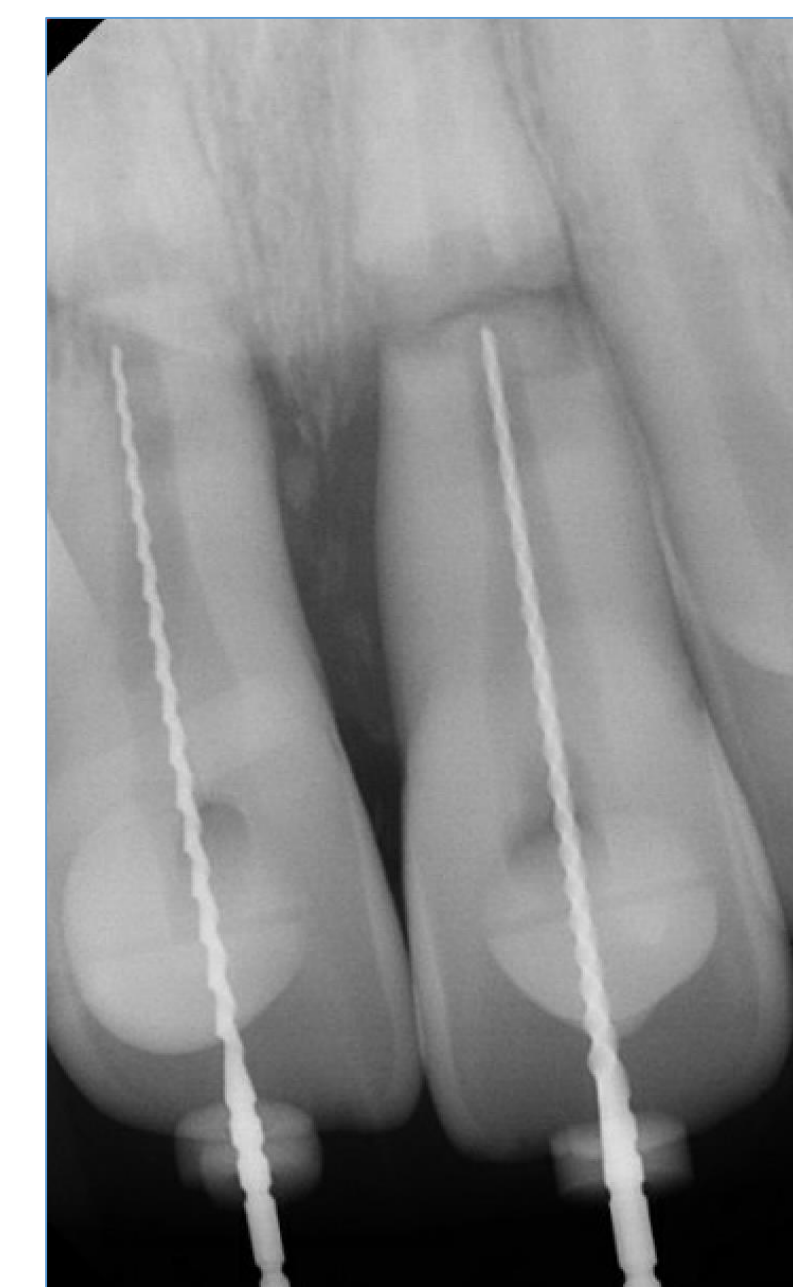
## FOLLOW UP/TREATMENT

### REFERRAL TO ENDODONTICS

- Referral made to UCONN Endodontics following the trauma guidelines:
  - "Pulp necrosis and infection may develop later. It usually occurs in the coronal fragment only. Hence, endodontic treatment of the coronal segment only will be indicated. As root fracture lines are frequently oblique, determination of root canal length may be challenging. An apexification approach may be needed. The apical segment rarely undergoes pathological changes that require treatment."

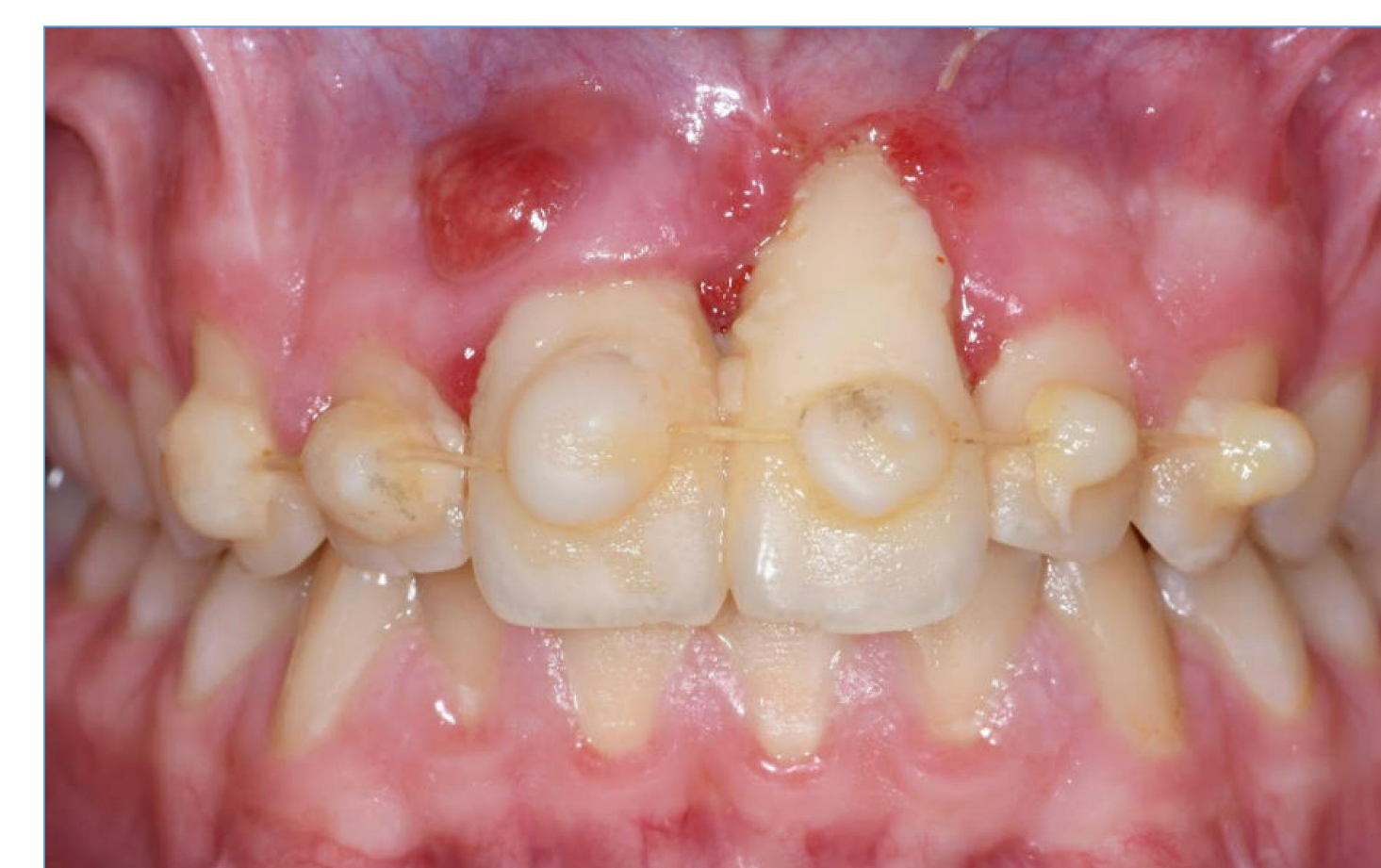
### ENDODONTIC CONSULT/TREATMENT

- Diagnosis: Teeth #8 & #9 pulpal necrosis with normal apical tissue. RCT indicated.
- Poor prognosis due to mobility.
- RCT initiated at following visit. Calcium hydroxide placed in coronal fragment canals.
- Advised to re-evaluate in 1 month if RCT is to be completed or if other treatment is recommended based off prosthodontics consult.
- Referral made to UCONN Prosthodontics.



### PROSTHODONTICS CONSULT

- Exam of teeth #8 & #9: Attachment loss, lacerated gingiva, abscess associated with tooth #8. Grade 3 mobility. No pain, swelling or tenderness. Teeth from #6-11 have been splinted with fish wire and flowable composite.
- Teeth #8 & #9 deemed non-restorable.



**Treatment Plan:** Extraction of #8 and #9 and use natural tooth crown to fabricate a Maryland bridge until patient is ready for implants.

### TREATMENT

- Extractions of #8 and #9 coronal fragments performed. Root tips left to halt bone resorption.



## FINAL OUTCOMES

### MARYLAND BRIDGE DELIVERY

- Maryland bridge fabricated with the natural teeth crowns of teeth #8 and #9.



### FINAL TREATMENT

- Due to patient's active lifestyle, Maryland bridge was debonded over several occasions over 1 year. Maryland bridge no longer good long-term treatment option.



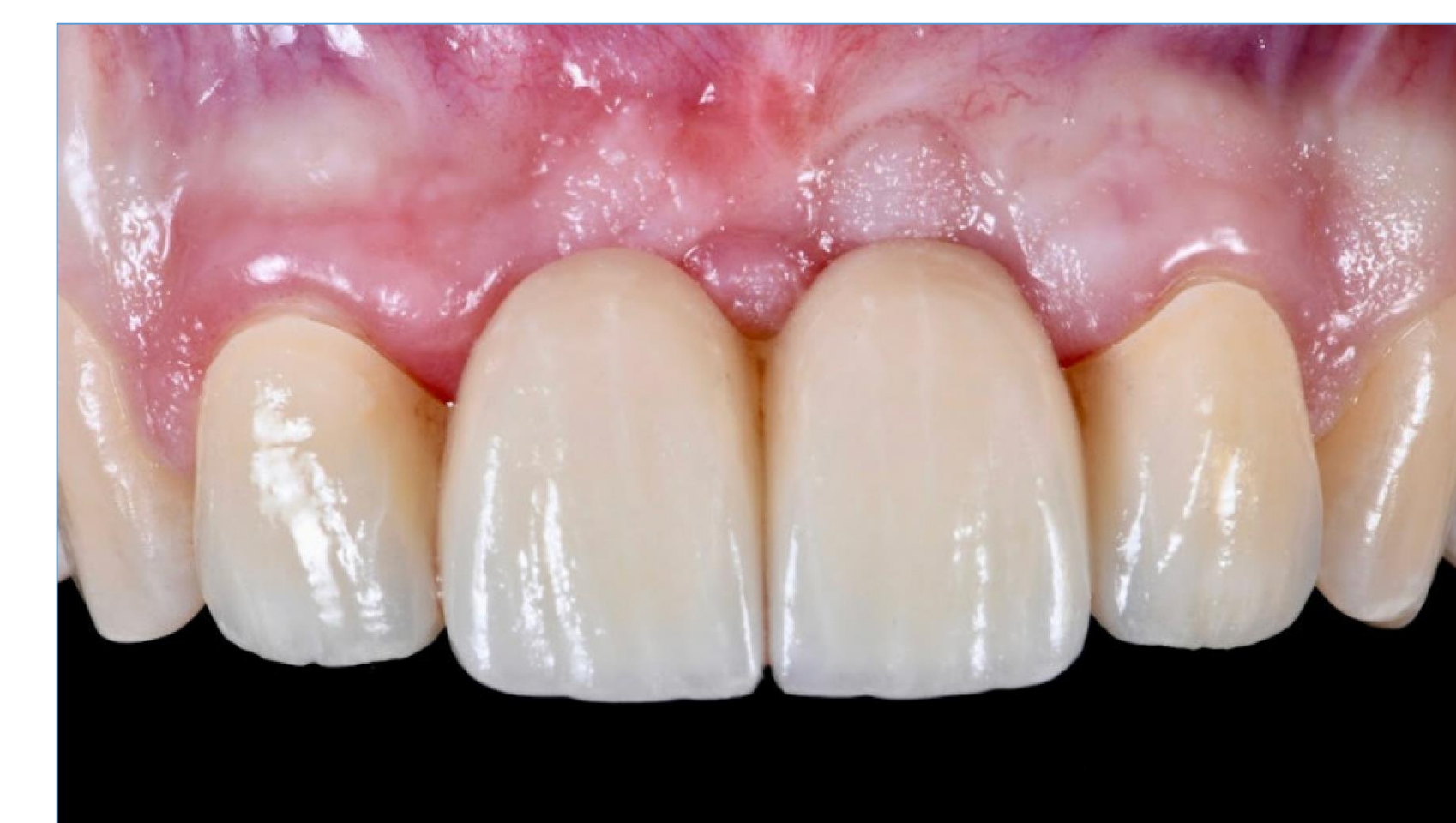
**Final Treatment Plan:** 4-unit Feldspathic Porcelain fused to Zirconia (FPZ) bridge from teeth #7-#10.

### FINAL PHOTOS



- Crown preparations completed on teeth #7 & #10.

Final bridge delivery!



## REFERENCES

- Bourguignon C, Cohenca N, Lauridsen E, et al. International Association of Dental Traumatology guidelines for the management of traumatic dental injuries: 1. Fractures and luxations. Dent Traumatol 2020;36(4):314-330. <https://doi.org/10.1111/edt.12578>.
- American Association of Endodontists (2013), *The Recommended Guidelines of the American Association of Endodontists for the Treatment of Traumatic Dental Injuries*. [https://www.aae.org/specialty/wp-content/uploads/sites/2/2019/02/19\\_TraumaGuidelines.pdf](https://www.aae.org/specialty/wp-content/uploads/sites/2/2019/02/19_TraumaGuidelines.pdf).