Severe Extrusion and the Response of the Neurovascular Bundle

Dr. Tanner Gamble, DMD

University of Nevada Las Vegas School of Dental Medicine

Introduction

Household injuries account for a large percentage of dental trauma. The majority of these trauma cases occur outside normal office hours, limiting a patient's access to care. Treatment options vary based on the severity of the injury. Close follow-up is extremely important as the most common complications following dental trauma are pulpal necrosis and dental abscess. There are two challenges to the pulp following dental trauma: 1) the neurovascular bundle can be severed which results in ischemia and sterile necrosis and 2) bacterial infection of the pulp which results in infection related necrosis. Severe injuries can also lead to torn PDL fibers. This can lead to increased osteoclastic activity and present as root resorption. Dental extrusion occurs when the tooth is removed from the socket, stretching the neurovascular bundle and PDL fibers. The injuries may not lead to a complete tear of the bundle or fibers and should be monitored as vitality may be preserved. Due to this, it is important to monitor teeth and identify two or more signs of loss of vitality before proceeding with a root canal. Some of these signs are: loss of response to vitality testing, tenderness to percussion, color change or radiographic evidence of necrosis.

Case Description

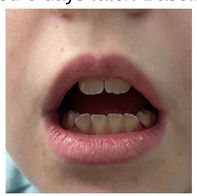
Patient: 11 year old female presented with CC "I was rough housing with my brothers and when I jumped, I landed on a knee and my tooth popped out.""

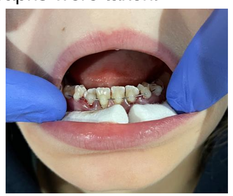
Medical History: No reported medical history.

Medications/ Allergies: No reported medications or allergies

Family/Social History: None reported

Received a phone call from the mother of the patient. The mother stated that the patient had jumped and landed on one of her brother's knees. Tooth #26 was extruded about 8 mm but was not avulsed. Teeth #23, 24 and 25 were subluxated. The mother sent a picture of the tooth and was instructed to push the tooth back in the socket as quickly as possible. The mother sent another photo, one minute later, stating that the patient was able to "push the tooth back in". No alveolar fracture present upon clinical examination. A splint was placed on the teeth from mandibular right primary first molar to mandibular left primary first molar for stability. Follow up completed 3 days later. Baseline radiographs were taken.





Initial/Baseline

Teeth fully seated in socket
PDL and lamina dura visible
Widened PDL space
#24, 25, 26: Grade II mobile
#23: Grade I mobile

2 Week Follow-up

PDL and Lamina dura visible
#23, 24, 25, 26: Grade I mobile
Splint removed
Normal response to endo ice
Percussion negative
No color change, asymptomatic

6 Week Follow-up

PDL and lamina dura visible
#23, 24, 25, 26: no mobility
Normal response to endo ice
Percussion negative
No color changes, asymptomatic

3 Month Follow-up

PDL and lamina dura visible
#26, 25, 24, 23: no mobility
Normal response to endo ice
Percussion negative
No color changes, asymptomatic

Patient will have a 6 month and 12 month follow up

Discussion

In dental trauma intrusion and avulsion have the highest risk of pulpal necrosis. With these injuries root canal therapy is recommended within the first two weeks. Extrusion has a better prognosis but does depend on the severity of the extrusion. The more severely the tooth is extruded, the more damage will occur to the neurovascular bundle and PDL fibers. It is important to take the age of the patient into consideration when making decisions about treatment. Invasive treatment in a younger patient can lead to a higher risk of pulpal death and failure at an early age. It is important to assess each dental trauma case individually as each patient is different. Age of the patient, general dental health, reliability of the parent, periodontal condition, caries risk and patient's motivation and desires all need to be considered. Educating the parent on the risks, benefits and alternatives can lead to success and patient/parent acceptance of the treatment plan.

References

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