

Orthodontic Repositioning of an Intruded Permanent Incisor: A Case Report

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Review:

Intrusive luxation injuries are defined by tooth displacement in an apical direction into alveolar bone. Intrusively luxated teeth are unlikely to exhibit normal responses to pulp vitality or sensitivity testing. Percussing an intruded tooth usually results in a metallic sound. Reports of successful treatment methods of intruded teeth include allowing the tooth to spontaneously re-erupt, orthodontically repositioning the tooth and surgically repositioning the tooth. The desired outcomes of these therapies are an intact periodontal ligament and lamina dura, no signs of root resorption and positive pulp vitality testing results. Unfavorable outcomes include ankylosis, root resorption, negative results to pulp vitality testing, and infection.

Hypothesis: Using gentle and continuous orthodontic forces to reposition a moderately intruded tooth (due to trauma) will maintain pulpal vitality and periodontal ligament health throughout the treatment course.

Introduction: An 8-year-old female presented to the Pediatric Dental Clinic at Rutgers School of Dental Medicine with a chief complaint of a displaced tooth subsequent to a fall. Pertinent medical history includes Grand Mal Seizures, which are managed by Vimpat (Lacosamide) and Onfi (Clobazam). The patient's mother reported that her child was in the Rahway Hospital Emergency Department the night prior and was then referred to the clinic. The patient's mother reported that there was no loss of consciousness during or after the fall and that the incident was not seizure-related. Clinical examination revealed tooth #9 was luxated buccally and intruded. No soft tissue pathology or lymphadenopathy was evident.

The International Association of Dental Traumatology has published the following guidelines for teeth with complete root formation that experience intrusive luxation:

- 1) Allow re-eruption if tooth is intruded less than 3mm
- 2) If tooth is intruded 3-7mm, reposition surgically (preferred) or orthodontically
- 3) If tooth is intruded beyond 7mm, reposition surgically

Using cone beam imaging, the apical displacement of tooth #9 was 6mm, thus the ideal plan and accepted option was orthodontic repositioning.

Initial records were taken at the first appointment in January of 2021.

Case: Orthodontic brackets were bonded to teeth #7, #8, #9, #10, and #H in January 2021. A passively-bent 0.016 stainless steel archwire was inserted in all brackets except UL1. An elastomer was threaded from tooth #9 to the archwire to aid in the re-eruption of tooth #9. The orthodontic wire progression continued with a 0.014 Nickel Titanium wire followed by a 0.018 Beta Titanium (TMA) wire added to compensate for incidental buccal movement of teeth #7, #8, #10, and #H. After proper positioning of the non-affected teeth was accomplished, the progression continued with an 0.018 TMA wire and finishing was accomplished with a 0.016x0.022 stainless steel archwire, and treatment was concluded. The patient was debonded in July of 2021.

Throughout the course of treatment, CBCT images were obtained to confirm that the PDL was maintained. The final CBCT image revealed that not only was PDL maintained, but no signs of pulpal pathology were present. Vitality was additionally confirmed through pulp testing teeth #7, #8, #9, and #10.

Medical Considerations: The patient's unique medical history presented minor challenges during treatment. During an appointment on March 23rd, 2021, the patient came into the orthodontic clinic exhibiting aura-like signs and symptoms. The patient had a blank stare on her face and claimed to be very thirsty. During this appointment, the patient sat in the chair for 30 minutes until aura-like signs and symptoms subsided. The patient was dismissed, and treatment continued two weeks later. Dentists must be able to recognize and accommodate medical (and psychological) conditions that can complicate or extend treatment plans.

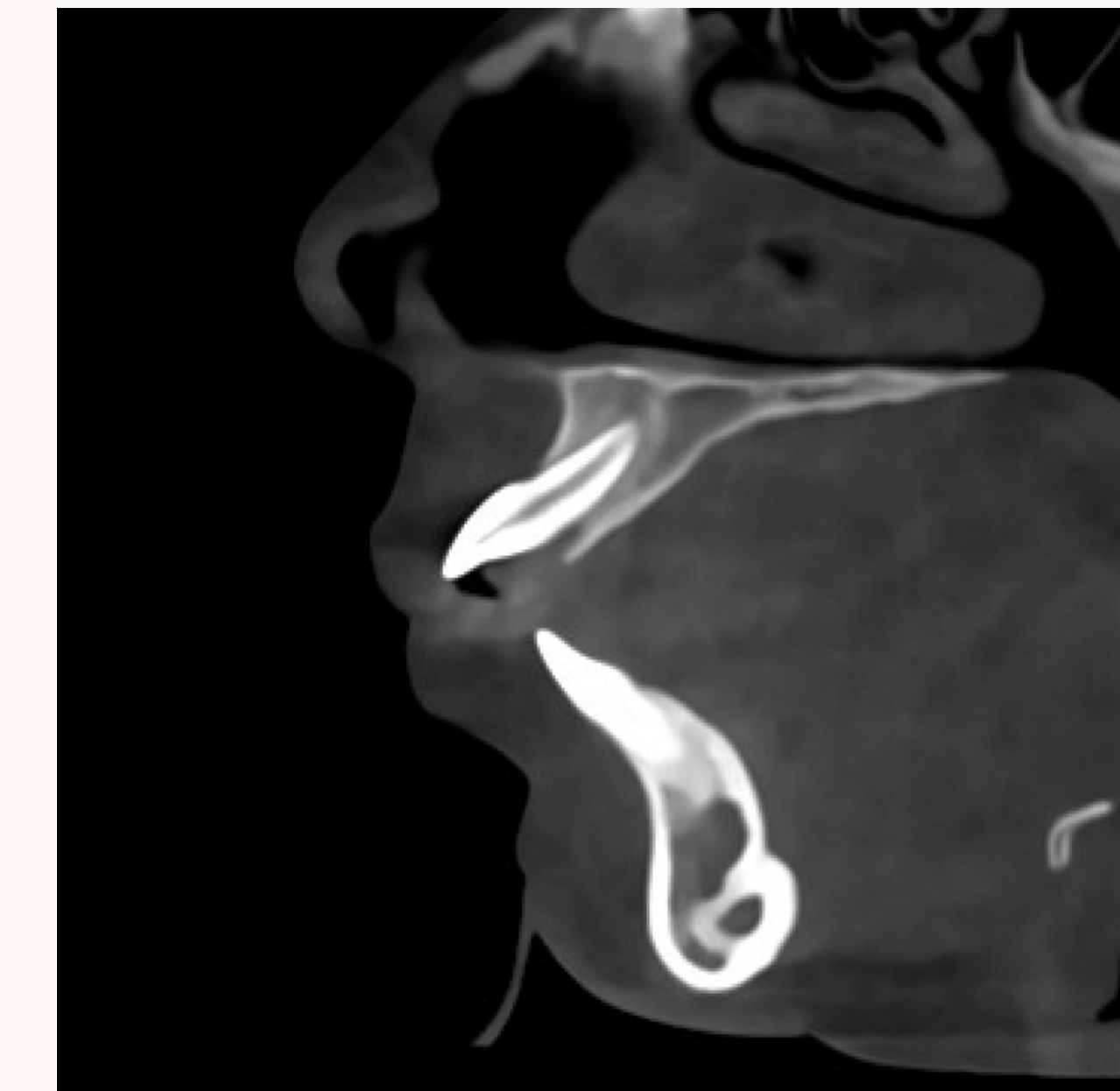


Figure a. Initial CBCT



Figure b. Initial Frontal



Figure c. Final CBCT



Figure d. Progress Frontal



Figure e. Final Periapical



Figure f. Final Frontal

References:

- 1) 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>.