Root Resorption and Exfoliation of Pulpotomy Treated Primary Molars versus Non-Pulpotomy Treated Contralateral Primary Molars

Sarah Kim, DDS; Kevin Benjumea, DMD; Sumitra Golikeri, DMD
Pediatric Dental Resident, Woodhull Medical Center

BACKGROUND

- Pulpotomy is currently the most frequently used vital pulp therapy technique for deep dental caries lesions in primary teeth. Indications for pulpotomy include pulp exposure following caries removal in a tooth with normal pulp, reversible pulpitis, or traumatic pulp exposure. Outcome is multifactorial and can depend on factors such as pre-operative pulpal diagnosis, technique, choice of medicament, and final marginal seal.
- Present therapeutic agents include calcium hydroxide, formocresol, ferric sulfate, and mineral trioxide aggregate (MTA). Formocresol and MTA are recommended choice of medicaments for primary teeth expected to be retained for at least 24 months.
- Internal root resorption (IRR) is a pathological phenomenon that may occur after pulpotomy due to chronic inflammation of the remaining radicular pulp. IRR can lead to early root resorption and subsequent loss of the primary tooth. Diagnosis is mainly based on radiographic findings.

OBJECTIVES

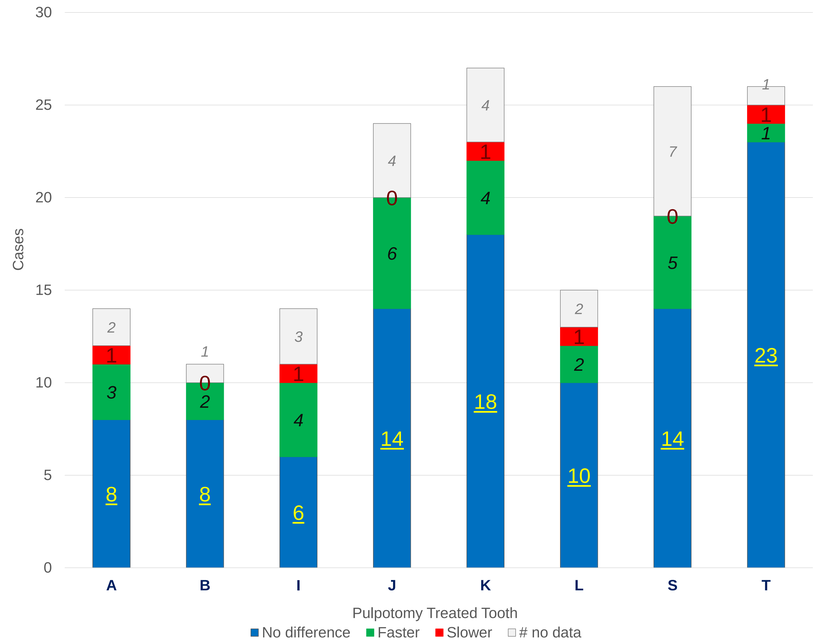
- Assess accelerated primary tooth exfoliation secondary to internal root resorption following pulpotomy treatment
- Compare root resorption of pulpotomy treated primary molars and non-pulpotomy treated contralateral primary molars

METHODS

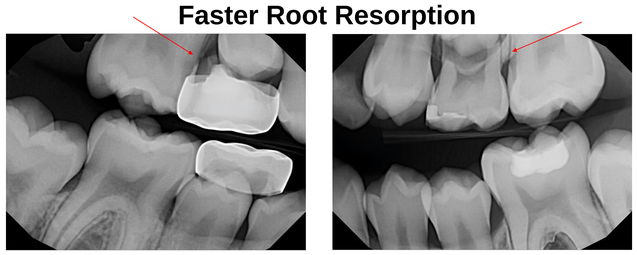
- Retrospective chart review of patients treated in the Department of Pediatric Dentistry at Woodhull Medical Center
- Inclusion criteria:
  - Pulpotomy and final restoration provided by Woodhull pediatric dental resident using MTA, IRM and Stainless Steel Crown
  - Retained contralateral primary molar with no history of pulp therapy
- Data sorted into 3 categories
  (1) No difference in rate of root resorption
  (2) Faster resorption of pulpotomy treated molar
  (3) Slower resorption of pulpotomy treated molar

RESULTS

- 157 cases of pulpotomy treated primary molars and non-pulpotomy treated contralateral primary molars
  - Pulpotomy tx completed 10/2018 – 08/2024 by 20 Woodhull pediatric dental residents
  - 80 F/77 M
  - Average age: 6.28
  - Average follow-up period: 2.23 years
  - 24 cases excluded due to incompletely visible roots on Bite-Wing

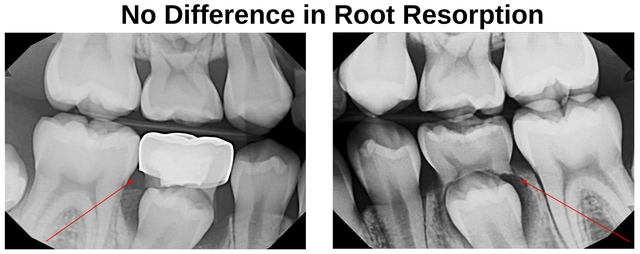


Faster Root Resorption



1/14/2025 – Pulpotomy treated #A vs Contralateral #J

No Difference in Root Resorption



9/18/2024 – Pulpotomy treated #T vs Contralateral #K

DISCUSSION

- The null hypothesis is accepted- There is no statistically significant difference in root resorption in pulpotomy treated primary molars versus non-pulpotomy treated contralateral primary molars
- There is significant difference in pulpotomy treated molars resorbing faster than their contralateral teeth versus pulpotomy treated molars resorbing slower than their contralateral teeth at p = .05
- Use of MTA during pulpotomy for treatment of deep caries lesions may minimize internal root resorption due to high degree of biocompatibility
- Slower exfoliation of pulpotomy treated primary molars may result from zinc oxide eugenol/IRM resorbing slower than the primary tooth root
- Although the study was carried out using a small number of cases, results were relatively consistent across different dental providers using the same restorative materials
- Case limitations resulted from transition to new imaging software and restricted access to radiographs taken prior to October 2022
- Further studies of pathologic root resorption expediting primary tooth exfoliation are recommended, clinically and radiographically, with a larger sample size and longer follow-up periods

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