**CASE REPORT**

# *Endodontic Management of an Infected Primary Molar with Full coronal Restoration*

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**Abstract**

*An 8-year-old male patient reported to the Department of Pediatric and Preventive Dentistry with the chief complaint of pain and swelling in the lower left back tooth region. Clinical examination revealed vestibular obliteration and localized gingival swelling in association with a deep carious lesion in the mandibular left second primary molar (tooth 75). A provisional diagnosis of chronic irreversible pulpitis with localized abscess was made. Emergency access opening was performed during the initial visit, followed by working length determination and chemo-mechanical preparation. In a subsequent appointment, after complete resolution of clinical symptoms, obturation was carried out using Metapex. The tooth was then restored with Type IX Glass Ionomer Cement (GIC) and reinforced with a preformed stainless steel crown to ensure long-term success. This case highlights the importance of prompt intervention and comprehensive endodontic management in maintaining the integrity of primary dentition and preventing the progression of infection*

## Introduction

The preservation of primary dentition is a cornerstone of pediatric dental care, ensuring proper mastication, speech development, and space maintenance for the eruption of permanent successors. Among the primary molars, the mandibular second molars are particularly critical due to their role in occlusal development and arch integrity.[1] However, their anatomy — characterized by complex root canal morphology and thinner enamel — makes them especially vulnerable to rapid carious progression and pulpal pathology.[2] Dental caries remains the most prevalent chronic childhood disease, affecting up to 60–90% of school-aged children globally, with higher prevalence reported in developing nations.[3] If left untreated, caries can progress to irreversible pulpitis and periapical infection, often presenting as pain, swelling, or vestibular obliteration.[4] Endodontic management of infected primary molars is essential not only to eliminate pain and infection but also to retain the tooth as a natural space maintainer until exfoliation.[5]

Contemporary pulpectomy procedures involve access opening, accurate working length determination, chemo-mechanical debridement, and obturation using resorbable medicaments. Metapex, a calcium hydroxide and iodoform-based paste, has gained widespread use due to its excellent antimicrobial properties, resorbability, and compatibility with primary root structures.[6]

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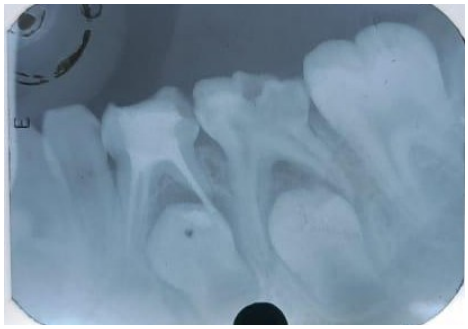
Final restoration with a preformed stainless steel crown is considered the gold standard following pulpectomy to provide a durable seal and restore function.

## Case Report

This case report describes the comprehensive endodontic management of a grossly carious primary mandibular second molar in an 8-year-old patient, emphasizing the clinical decision-making and procedural nuances involved in achieving a successful long-term outcome.

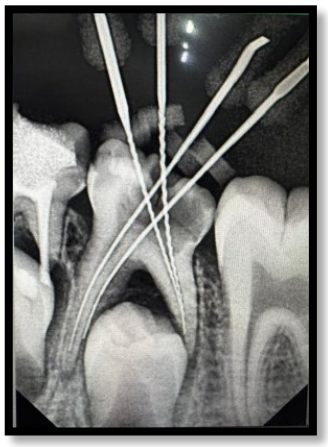
An 8-year-old male patient reported to the Department of Pediatric and Preventive Dentistry, Kothiwal Dental College and Research Centre, Moradabad, with a 4-day history of dull, intermittent pain and swelling in the lower left back tooth region. There was no significant medical history. Extraoral findings were within normal limits. Intraoral examination revealed a deep carious lesion in tooth 75, which was tender on percussion, along with vestibular obliteration and localized gingival swelling suggestive of a pus-filled area. Superficial caries were also noted in teeth 53, 54, 64, and 84, which were restorable. Tooth 74 showed signs of previous endodontic treatment; however, it lacked full coronal coverage, indicating incomplete restorative care.(Fig:1)(Fig:2)

**(Fig.1: Obliteration and localized gingival swelling w.r.t 75)**



**(Fig.2: Pre-Operative Radiograph w.r.t 75)**

Radiographic examination of tooth 75 revealed extensive caries involving the pulp with an almost completely open chamber and periapical radiolucency involving the roots. Based on clinical and radiographic findings, a diagnosis of chronic irreversible pulpitis with periapical abscess was made for tooth 75, while tooth 74 was diagnosed as previously treated without adequate post-endodontic restoration. Emergency access opening was performed on tooth 75 under local anesthesia. Working length was determined using an apex locator and confirmed radiographically, measuring approximately 15 mm and 14 mm in the mesiobuccal and mesiolingual canals, respectively, and 13 mm in the distal canal. Biomechanical preparation was carried out using K-files and irrigation with 1% sodium hypochlorite and saline. A triple antibiotic paste (TAP), composed of ciprofloxacin, metronidazole, and doxycycline, was placed within the canals to ensure disinfection, and systemic antibiotics were prescribed for five days.(Fig:3)(Fig:4)



**(Fig.3:Working length determination)**

**(Fig.4: Obturation with Merapex w.r.t 75)**

The patient was recalled after 15 days, showing marked improvement in symptoms. The TAP was refreshed, and the patient was reviewed again after 10 days. Upon follow-up, the patient was completely asymptomatic, with resolved swelling and no tenderness. Obturation was then performed using Metapex, followed by a restoration with Type IX Glass Ionomer Cement. A preformed stainless steel crown was cemented over tooth 75 to ensure long-term durability and function. To complete the treatment, a stainless steel crown was also delivered on tooth 74 to provide full coverage and restore masticatory efficiency.(Fig:5)

**(Fig.5: Post-operative intra-oral picture showing Sstainless steel crwon w.r.t 74 75 and Restoration w.r.t 84 85)**

**Discussion**

The primary objective of endodontic treatment in primary teeth is the elimination of microbial infection from the root canal system and the maintenance of the tooth in a symptom-free and functional state until natural exfoliation. In cases of advanced pulpal involvement accompanied by periapical pathology, as seen in this case, pulpectomy remains the treatment of choice. The use of calcium hydroxide–iodoform-based materials like Metapex as obturating agents has shown superior antimicrobial properties, biocompatibility, and ease of resorption in sync with the physiological root resorption process of primary teeth, thereby making it a material of preference in pediatric endodontics.[8,9]

Triple antibiotic paste (TAP), originally introduced by Hoshino et al., typically comprises metronidazole, ciprofloxacin, and minocycline, and has proven effective in disinfecting the root canal system.[10] However, due to concerns about minocycline-induced tooth discoloration, particularly in young patients, alternative antibiotics have been explored. Doxycycline, a second-generation tetracycline, has demonstrated comparable antimicrobial efficacy without the severe staining potential of minocycline. Sato et al. reported doxycycline's superior substantivity and ability to inhibit matrix metalloproteinases, making it an excellent substitute in TAP formulations when esthetics is a concern.[11] Furthermore, studies have shown that doxycycline maintains a wide antibacterial spectrum, targeting resistant root canal flora, thus supporting its clinical inclusion in pediatric TAP regimens.[12]

The debate between open versus closed dressing following endodontic intervention, especially in cases with acute infection and purulent discharge, is clinically significant. While open dressing provides immediate relief by allowing drainage and decompression, it also risks recontamination and patient noncompliance.[13] Closed dressing, on the other hand, when used after adequate canal debridement and irrigation, promotes faster healing by maintaining a sterile internal environment. A study by Reddy and Ramakrishna (2013) demonstrated that properly disinfected canals sealed with a medicated dressing and closed access showed better healing outcomes compared to open dressings in pediatric patients.[14] In the present case, a closed dressing protocol was successfully employed after thorough chemomechanical debridement and TAP placement, which contributed to uneventful healing and resolution of infection.

The importance of stainless steel crowns (SSC) as full-coverage restorations post-pulpectomy cannot be overstated. SSCs have been shown to provide superior marginal integrity, durability, and longevity compared to other restorative materials in pediatric patients, especially when dealing with extensive coronal destruction due to caries or endodontic access.[15] In this case, the decision to place SSCs on both 74 and 75 was critical in restoring masticatory function and preventing reinfection, thereby ensuring the longevity of the treated teeth.

The previous incomplete management of tooth 74, with absence of a post-endodontic full-coverage restoration, underscores a frequent cause of endodontic failure in pediatric practice. Inadequate coronal sealing invites bacterial recontamination and can compromise long-term outcomes even when root canal obturation is ideal.[16] Thus, comprehensive treatment must address not only the root canal disinfection and obturation but also definitive coronal restoration as a final seal.

Overall, the case demonstrates a structured, evidence-based approach to managing pediatric molar pulpectomy in the presence of infection, with modifications in TAP composition and adherence to closed dressing protocols contributing significantly to the positive clinical outcome. Strategic restoration using stainless steel crowns further ensured longevity, function, and caries prevention in a high-risk oral environment.

**Conclusion**

This case underscores the importance of a structured and evidence-based approach in managing pulpectomy in primary molars. The use of doxycycline in the triple antibiotic paste effectively addressed infection while minimizing discoloration. A closed dressing protocol promoted healing without risking reinfection. Final obturation with Metapex and full coronal coverage using stainless steel crowns ensured long-term success, function, and protection. Comprehensive diagnosis, disinfection, and timely restoration remain critical for favorable pediatric endodontic outcomes.

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