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**Research Paper** 



# Clinical Management of a Second Primary Molar with a Unilateral Missing Successor – A Case Report

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#### Abstract

This case report details the endodontic management of a left mandibular second primary molar in an 8-year-old patient, where the permanent successor was congenitally absent. The treatment involved root canal therapy using gutta-percha as the obturation material. This approach aims to preserve the primary molar as a functional unit, preventing space loss and maintaining occlusal integrity. The report discusses the clinical considerations, treatment methodology, and the rationale behind selecting gutta-percha for obturation in such unique cases.

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## I. Introduction

The congenital absence of a permanent second premolar on one side is a relatively uncommon dental anomaly, with a prevalence of approximately 2–4% in the general population (1). Unilateral agenesis of the second premolar presents a unique clinical challenge, as it can lead to asymmetrical occlusal forces, unilateral space loss, and potential midline deviation if not managed appropriately (2). In such cases, the retention of the primary second molar is often the preferred treatment approach to preserve space, maintain occlusal function, and prevent adverse orthodontic consequences (3).

Typically, primary molars exfoliate naturally to allow for the eruption of their permanent successors. However, when a second premolar is congenitally absent on one side, early loss of the corresponding primary second molar can cause mesial tipping of the adjacent permanent first molar, supra-eruption of opposing teeth, and loss of vertical dimension on the affected side (4). If not addressed in time, these changes may necessitate complex orthodontic interventions or prosthetic rehabilitation (5).

Pulpectomy is a viable treatment option for primary second molars with irreversible pulpitis or necrosis, particularly when long-term retention is required. Traditional obturation materials for primary teeth include resorbable substances such as zinc oxide eugenol (ZOE) or calcium hydroxide-iodoform pastes, which allow for physiological root resorption and exfoliation (6). However, in cases where the primary molar is expected to function indefinitely due to the absence of its permanent successor, non-resorbable materials such as guttapercha may provide greater long-term stability (7).

Gutta-percha is the gold standard obturation material for permanent teeth due to its biocompatibility, dimensional stability, and ability to provide a hermetic seal against bacterial infiltration (8). Although its use in primary teeth is generally avoided due to concerns about non-resorption, studies have demonstrated its effectiveness in preserving primary molars when a permanent successor is absent (9). By preventing premature root resorption, gutta-percha can extend the functional lifespan of the primary molar and maintain occlusal stability, minimizing the need for early prosthetic or orthodontic intervention (10).

This case report presents the endodontic management of a mandibular second primary molar in an 8-year-old patient with a congenitally missing permanent second premolar on one side.

## II. Case Report:

An 8-year-old female patient presented with a chief complaint of pain in the lower left back tooth region for two weeks. Her medical history was unremarkable, and there were no systemic conditions affecting dental treatment. Clinical examination revealed a deep carious lesion on the primary left mandibular second molar (#75) without swelling or sinus tract formation. The tooth exhibited mild tenderness on percussion.

A periapical radiograph (RVG) showed extensive caries reaching the pulp chamber (figure no.1), with no pathological root resorption. Additionally, the radiograph(figure no. 2) confirmed the congenital absence of the mandibular left permanent second premolar (tooth no.35).



Figure no.1 -periapical RVG irt. tooth no. 75



Figure no. 2 – Orthopantomograph depicting unilateral congenital absence of mandibular left  $2^{n}$  premolar.

Based on these findings, a diagnosis of irreversible pulpitiswas made. Since the tooth had no permanent successor, the treatment plan focused on long-term retention, including pulpectomy, obturation with gutta-percha, and coronal restoration with a stainless steel crown (SSC).

Local anaesthesia was administered using 2% lidocaine with 1:100,000 epinephrine, and the tooth was isolated with a rubber dam. A conventional access cavity was prepared, and necrotic pulp tissue was extirpated. Working length was determined & the canals were instrumented using K-flex files (#15-#35) and irrigated with 1.5% sodium hypochlorite (NaOCl), followed by saline and 17% EDTA for smear layer removal. After drying the canals, gutta-percha (GP)cones were placed coated with ZOE sealer, and vertical compaction was performed to achieve a tight apical seal. A post-obturation radiograph confirmed proper canal filling (figure no.3). The access cavity was sealed with glass ionomer cement (ShofuFx Ultra Bulk Fill Glass Ionomer Restorative).

After 1 week a preformed stainless steel crown (3M ESPE) was adjusted and cemented with luting GIC (Shofu Hy-Bond Glassionomer CX-Smart Luting Cement Set)to reinforce the tooth (figure no.4). The treatment successfully relieved symptoms, preserved the tooth as a functional unit, and prevented space loss due to the missing successor



Figure no.3 -Gutta perchaobturation done in tooth no. 75



Figure no. 4 – Stainless steel crown placed irt. tooth no. 75

## III. Discussion

The management of a primary second molar with a missing permanent successor requires a strategic approach to ensure long-term retention and function. Retaining the primary tooth is crucial for maintaining arch integrity, preventing space loss, and avoiding complex orthodontic or prosthetic interventions (1). The congenital absence of the mandibular second premolar occurs in approximately 2–4% of the population, with a higher prevalence in females (2). If the primary molar is lost prematurely, adjacent teeth may drift into the space, leading to occlusal disturbances, midline shifts, and a higher risk of malocclusion (3). In this case, a conservative approach was chosen to preserve the tooth by performing a pulpectomy, obturating with guttapercha, and restoring it with a stainless steel crown (SSC).

Since the tooth was diagnosed with irreversible pulpitis, pulpectomy was performed to remove the infected pulp tissue and eliminate the source of pain. Hand K-flex files were used for root canal preparation instead of rotary instruments. Hand instrumentation remains a reliable method for primary teeth due to better tactile control, reduced risk of over-preparation, and preservation of remaining dentin, which is critical in primary molars with thinner canal walls (11). Studies have shown that K-flex files provide adequate debridement while minimizing procedural errors such as transportation or perforation, which are more common in curved and narrow primary molar canals (12). Although rotary systems offer advantages in speed and efficiency, hand filing allows for careful negotiation of canals with anatomical variations, reducing the chances of ledge formation and ensuring optimal cleaning and shaping (13).

Irrigation is a crucial step in root canal disinfection, particularly when using hand instrumentation. In this case, 1.5% sodium hypochlorite (NaOCl) was used as the primary irrigant due to its antibacterial properties and ability to dissolve necrotic tissue. This was followed by saline irrigation and 17% EDTA to remove the smear layer, enhancing the adhesion of the gutta-percha and ZOE sealer (8). Obturation was performed using gutta-percha, which was chosen over resorbable materials due to the need for long-term retention of the primary molar. Gutta-percha provides superior sealing ability, does not resorb prematurely, and ensures the stability of the root canal filling, which is essential for teeth without permanent successors (9).

After obturation, the tooth was restored with a stainless steel crown to provide structural reinforcement and prevent coronal fractures. SSCs are widely considered the gold standard for restoring endodontically treated primary molars due to their high success rates, durability, and ability to withstand occlusal forces (14). Research indicates that SSCs significantly improve the long-term survival of pulpectomized primary molars compared to direct restorations like composite or amalgam (15). Additionally, in cases where the tooth must be retained into adolescence or adulthood, SSCs offer superior longevity compared to other restorative options (6).

One potential concern with retaining a primary molar long-term is the risk of infraocclusion or ankylosis. Infraocclusion occurs when the primary molar fails to maintain occlusal contact due to continued eruption of adjacent permanent teeth (16). While regular follow-ups are necessary to monitor for signs of infraocclusion or progressive root resorption, studies suggest that many retained primary molars remain functional into adulthood without significant complications (17).

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