



## Endodontic management of a primary mandibular three-rooted molar

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### Abstract

**Objective:** The knowledge of internal tooth anatomy and its variations is essential to perform a successful endodontic treatment. The presence of a supernumerary root in primary teeth is uncommon compared to permanent dentition. This paper aims to report a clinical case of an endodontic management of a primary mandibular three rooted molar.

**Case Report:** A 5-year-old female patient complained about a tumefaction in the mandibular left posterior region. The intraoral examination revealed an active caries lesion in the primary mandibular left second molar and swelling in the buccal mucosa related to this tooth. The radiographic exam revealed bilateral primary mandibular three-rooted second molar, and the affect one exhibited periapical radiolucency and was submitted to an endodontic treatment, since clinical and radiographic examination suggested a diagnosis of apical periodontitis. After one-year follow-up the tooth was asymptomatic and the radiographic examination showed a total healing of the periapical lesion.

**Conclusion:** A proper diagnosis, based on appropriated radiographies, and an adequate endodontic treatment, in an atypical primary tooth is important to preserve it until normal exfoliation period, maintaining the tooth function, and avoiding development defects to the germ of successor permanent.

**Key words:** Endodontics; Deciduous tooth; Molar; Children

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### Tratamento endodôntico de molar decíduo inferior de três raízes

#### Resumo

**Objetivo:** O conhecimento da anatomia interna dos dentes e suas variações, é essencial para a realização de um tratamento endodôntico eficiente. A presença de raiz supranumerária em dentes decíduos é mais rara do que em dentes permanentes. Este trabalho tem como objetivo reportar um caso clínico de tratamento endodôntico em um molar inferior de três raízes.

**Relato de Caso:** Paciente do sexo feminino, 5 anos de idade, relatou tumefação na região mandibular posterior esquerda, o exame intrabucal revelou lesão de cárie ativa no segundo molar inferior decíduo, e inchaço na região vestibular deste dente. O exame radiográfico mostrou segundos molares decíduos inferiores com três raízes, bilateralmente, e o dente afetado revelou área periapical radiolúcida e foi submetido ao tratamento endodôntico, visto que sinais clínicos e radiográficos indicavam periodontite apical. Após preservação de um ano, o dente mantinha-se assintomático e o exame radiográfico revelou completa regressão da lesão periapical.

**Conclusão:** Um diagnóstico correto, feito por meio de radiografias apropriadas realizadas antes do tratamento, e um adequado procedimento endodôntico em molares decíduos atípicos, são importantes para preservação do dente até sua esfoliação no tempo adequado, mantendo o dente em função, e não sendo agressivo com o dente sucessor.

**Palavras-chave:** Endodontia; Dente decíduo; Molar; Crianças

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**Received:** September 24, 2014  
**Accepted:** May 15, 2015

**Conflict of Interests:** The authors state that there are no financial and personal conflicts of interest that could have inappropriately influenced their work.

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## Introduction

One of the most important targets in endodontic therapy is the complete healing of periapical tissues, this treatment aims to heal the damages originated from pulp and periapical pathology, and the healing is only achieved when clinician watches carefully every step of the treatment. The knowledge of internal dental anatomy and its variation have great importance for an accurate endodontic management. Permanent and primary mandibular molars usually have two roots, which are positioned mesially and distally. The existence of a supernumerary root in primary teeth is less common than in permanent teeth [1,2].

The incidence of a supernumerary root in permanent or primary mandibular molar can be a racial characteristic of South American Indians or Mongoloid populations [3,4]. The prevalence of primary mandibular three-rooted molars is close to 5% in mongoloid people, but affects less than 1% in general population [1,3,4].

There are some studies that have focused on supernumerary root in primary molars [1-7] but just one presented endodontic treatment in these unusual primary molar [2]. Since the lack of information in the literature about endodontic treatment in supernumerary root those unusual primary teeth, this paper aims to report a successful endodontic management of a primary mandibular three-rooted molar with pulp necrosis and apical periodontitis, in a Brazilian child.

## Case Report

A 5-year-old Caucasian female patient complained of swelling in the mandibular left posterior region. The patient's medical and family histories were consistent with normality and there were no systemic manifestations.

Intraoral examination confirmed the presence of swelling in the buccal region of the primary mandibular left second molar which presented active occlusal and buccal caries lesion (Fig. 1). Tooth mobility and probing depths were normal, but there were severe sensitivity to percussion along with unresponsiveness to thermal pulp testing. Additionally the child had several carious lesions in others teeth. Radiographic exam of the affected tooth exhibited a radiolucent periapical area in the bone tissue at the furcation area and the presence of an additional root located distolingually (Fig. 2). Panoramic radiograph revealed a bilateral presence of three-rooted second inferior molar and no other dental anomalies (Fig. 3). Panoramic radiographs were taken from patient's parents, but no teeth anomalies were detected in them.

Clinical and radiographic examination suggested a diagnosis of apical periodontitis. The patient and her parents were informed about the complex anatomy of the tooth and its possible complications. After a written consent from parents, the endodontic treatment and tooth restoration were performed as described below.



Fig. 1. Clinical view of the primary mandibular second molar. Presence of occlusal caries and gingival swelling.



Fig. 2. Radiographic exam of the primary mandibular second molar. Presence of apical periodontitis and an additional root located distolingually.

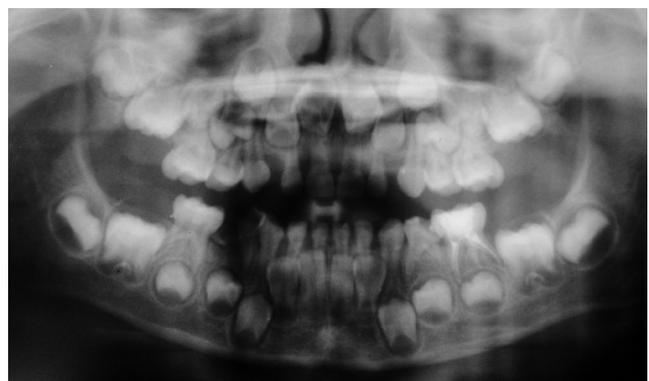


Fig. 3. Panoramic radiographic exam showing bilateral presence of three-rooted second inferior molar and no other dental anomalies.

Asepsis of the oral cavity was performed for one minute. Next, local anesthetic was provided with 2% mepivacaine (DFL Indústria e Comércio Ltda, Rio de Janeiro, RJ, Brazil) followed by rubber dam isolation and disinfection of the operative field using sterile gauze soaked in 2% chlorhexidine digluconate. Access to the root canal was gained using round diamond burs and Endo-Z burs (Les Fils d'August, Maillefer, Switzerland). During the access surgery, the pulp chamber was irrigated with distilled water, followed by suction.

The working length of each canal was determined with an electronic apex locator (Root ZX-II – J. Morita – Japan) and radiographically confirmed (Fig 4). Root canals were cleaned and shaped using the step-back technique to apical size ISO 35 manual files with copious irrigation with 2.5% sodium hypochlorite (Ribeirão Preto School Pharmacy of University of São Paulo, Ribeirão Preto, São Paulo, Brazil). The root canals were then dried and filled with 17% EDTA (Ribeirão Preto School Pharmacy of University of São Paulo, Ribeirão Preto, São Paulo, Brazil) to remove the smear layer. After final irrigation with sodium hypochlorite, the root canals were dried with sterile paper points and filled with a calcium hydroxide-based intracanal dressing (Calen<sup>®</sup> paste; S.S. White Artigos Dentários Ltda, Rio de Janeiro, RJ, Brazil; composition: 2.5 g calcium hydroxide, 0.5 g zinc oxide, 0.05 g colophony and 1.75 mL polyethylene glycol 400 – vehicle), and subsequently the tooth was temporarily sealed with glass ionomer cement.

After one month the child returned with no complaints and the swelling had disappeared. The intracanal medication was removed and the root canals were filled with a resorbable calcium hydroxide-based paste (Calen<sup>®</sup>) thickened with zinc oxide confirmed by a radiograph (Fig. 5A), as described previously [8]. The access cavity was sealed with glass

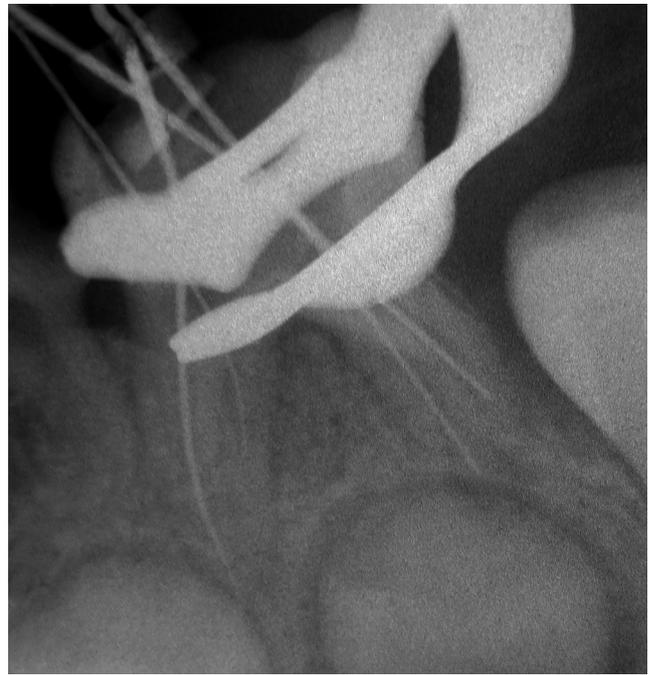


Fig. 4. Radiological confirmation of the working length.

ionomer cement, and the tooth was restored permanently with a universal composite resin restorative material (3M ESPE, St. Paul, MN, USA).

After one year of follow-up, clinical examination revealed that the tooth was asymptomatic and it was not sensitive to palpation and percussion. The tooth was functional and no signs of sinus tract or edema were noted. Radiographic examination revealed complete healing of periapical lesion (Fig. 5B).

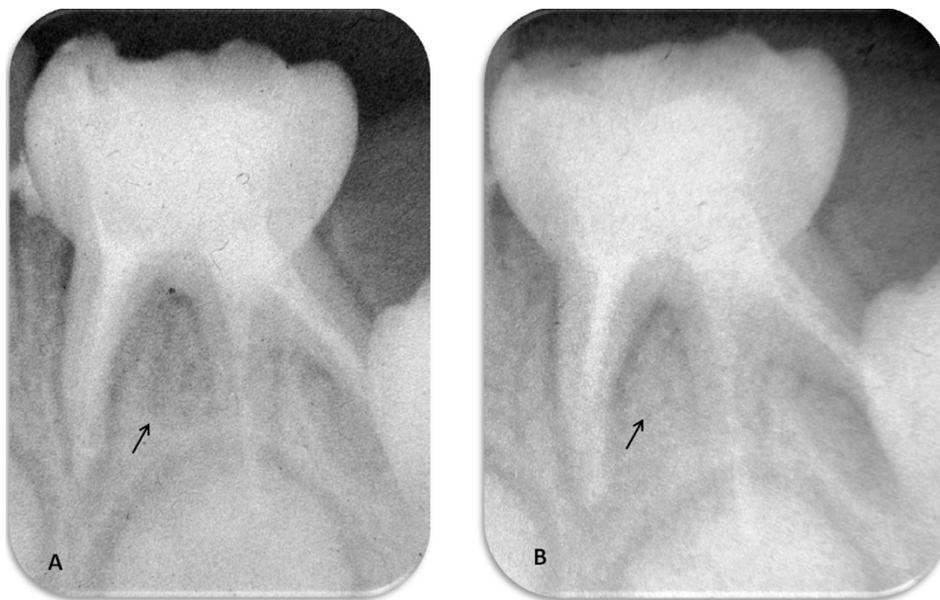


Fig. 5. A - The final radiograph exam after root canal therapy. B - Preservation radiographic exam after one year. Note the complete healing of the periapical radiolucency and bone formation (arrows).

## Discussion

This paper reports a case of an endodontic treatment of an uncommon primary mandibular three-rooted second molar, with pulp necrosis and apical periodontitis. The estimated prevalence of primary mandibular three-rooted molars in general population is less than 1%, while in Mongoloid group is nearly 5% [4]. In the case described the patient was a Brazilian Caucasian girl, which may not be taken into consideration since Brazilians derived from a miscellaneous of people. The patient is the only child and her parents did not present dental anomaly as confirmed by panoramic radiographs. The presence of bilateral primary mandibular three-rooted molars is even rarer, observed in less than 20% in children that present this condition [3,4]. In our patient only one of them needed endodontic treatment.

Although some reports present cases or even prevalence studies of primary mandibular three-rooted molars [1-7], only one of them presented an endodontic treatment, and the affected tooth was a primary mandibular first molar [2]. In contrast, in our case that occurred in a primary mandibular second molar.

Clinicians must be familiar with internal root anatomy and its variations and should perform radiographic exams before endodontic procedure [3,4]. Misdiagnosis of root anomalies can lead to untreated root canals, and consequently, unsuccessful endodontic therapy. Furthermore, pulp chamber access must be carefully executed, particularly in primary molars with root anomalies, since primary teeth present fewer amounts of mineral contents [4]. In our case, the final access cavity was distally extended, and presented a trapezoidal shape, which was necessary to improve location and access to root canals.

According to American Academy on Pediatric Dentistry Clinical Affairs Committee-Pulp Therapy Subcommittee [9], pulpectomy is the treatment of choice in teeth exhibiting clinical and radiographical signs of pulp necrosis, if there is minimal or no root resorption. In the present case the tooth presented active carious lesion, swelling in the buccal region and apical periodontitis, visible in the radiographic exam, indicating the pulpectomy procedure.

Working length determination is a critical step during endodontic treatment, especially in a primary tooth, where clinician must minimize damage to permanent successor dental germ. In this present case, the working length was determined by an electronic apex locator and confirmed by one radiograph, in order to limit child radiographic exposure, and facilitate this procedure, as the tooth had a supernumerary root that could be difficult to distinguish in the exam. The use of electronic apex locator in primary teeth has been support by its excellent accuracy results [10,11].

Intracanal dressing and filling with calcium hydroxide-based pastes in primary teeth has been widely recommended and used because of its proven antibacterial properties [12], biocompatibility [8,13,14], periapical tissue healing stimulation [13,14] and capacity to detoxify bacterial

LPS [15]. In the present case, since the teeth exhibits apical periodontitis, a calcium hydroxide-based intracanal dressing paste was applied and left for 30 days with the intention of reducing bacterial contamination in unreachable areas to mechanical instrumentation or irrigating solutions [13, 15]. After this period the teeth was filled with a calcium hydroxide-based paste thickened with zinc oxide. This paste has the previously discussed properties of calcium hydroxide and reabsorbs concomitantly with the physiological root resorption process [8,12-15]. The treatment was successful, since the tooth was symptom-free, clinically and radiographically normal, with apical periodontitis repaired evident in 1-year of preservation exam.

Therefore, this article illustrates the importance of a correct diagnosis and adequate endodontic treatment in an atypical primary tooth, which is important to preserve the teeth until normal exfoliation period, maintaining the tooth function and not being aggressive with the permanent germ.

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