



Unerupted second primary mandibular molar positioned inferior to the second premolar: case report

Maria Cristina Borsatto, DDS, PhD Ana Teresa Sant'Anna, DDS Henrique Niero, DDS
Ulysses Nicida Soares, MD Luiz Carlos Pardini, PhD

Dr. Borsatto is Assistant Professor of the Pediatric Dentistry Department, Dr. Sant'Anna and Dr. Niero are both Professionals of the Private Clinic, Dr. Soares is Assistant Professor of Surgery and Maxillo Facial Traumatology Department, and Dr. Pardini is Assistant Professor of the Radiology Department, they are all at the Dental School of Ribeirão Preto, University of São Paulo.

Abstract

This report is a clinical case of a 7-year-old child who presented right impacted second primary mandibular molar. This tooth was positioned inferior to the second premolar successor and a supernumerary tooth superior to the second premolar. Clinical examination did not reveal systemic diseases or trauma in the facial region. Treatment consisted of the extraction of the impacted second primary molar and the supernumerary tooth. Periodic examination was indicated for follow-up. (Pediatr Dent 21:205-208, 1999)

Dental eruption is generally understood as a physiological condition consisting of the occlusal or axial movement of the tooth from its position and development inside the bone tissue until its complete and functional oral positioning when reaching the occlusal plane.¹

The permanent teeth and their preceding primary teeth perform distinct, but synchronized, dental movements before the primary tooth undergoes exfoliation and is replaced by the permanent one. However, any local or systemic alteration occurring during this phase may cause alterations in dental development.¹

Impaction of the tooth can be the result of the absence of space in the dental arch, the presence of supernumerary teeth and the occurrence of infectious processes in the eruption path or of traumatic facial injury which may reach the tooth bud. This occurs because of some alterations in the dental follicle or periodontal ligament causing the termination of tooth eruption which in turn leads to ankylosis in the surrounding bone. Ankylosed primary teeth impair the eruption of the succedaneous permanent teeth.¹

Inversion of the intra-osseous position of the primary tooth and its succedaneous permanent tooth is a very rare condition. A review of the literature of the last 20 years revealed only four cases of unerupted primary molars located inferior to the premolar successor (Table 1).²⁻⁵ In addition, a case of an ankylosed primary tooth whose succedaneous permanent tooth did not erupt has been reported.⁶

The etiology of impaction is probably related to early ankylosis of the second primary molar. Mjör⁷ reported that the tooth buds of the permanent teeth develop in the palatine region of the superior arch and in the lingual region of the inferior arch in relation to the enamel organ of the primary tooth.

After completion of calcification of the crown and the beginning of calcification of the root, the primary molar erupts actively. Under normal conditions, the premolar bud develops near the roots of the primary molars. In the case of early ankylosis, the permanent tooth, which emerges lingually to the

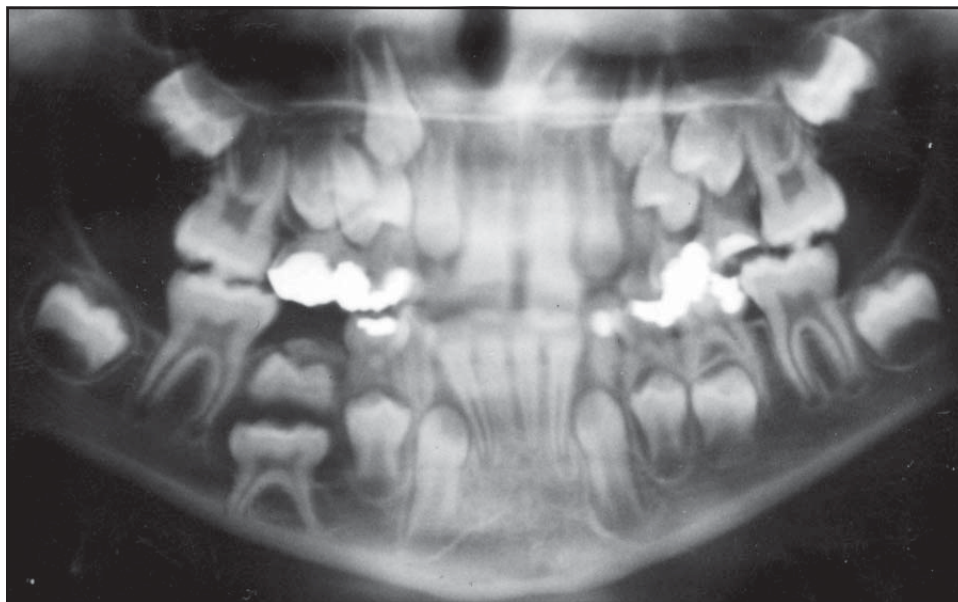


Fig 1. Panoramic extraoral radiograph showing the dental arches of the patient. On the right, mandibular area note the presence of the impacted primary molar and premolar bud in an ectopic position.

Accepted January 24, 1998

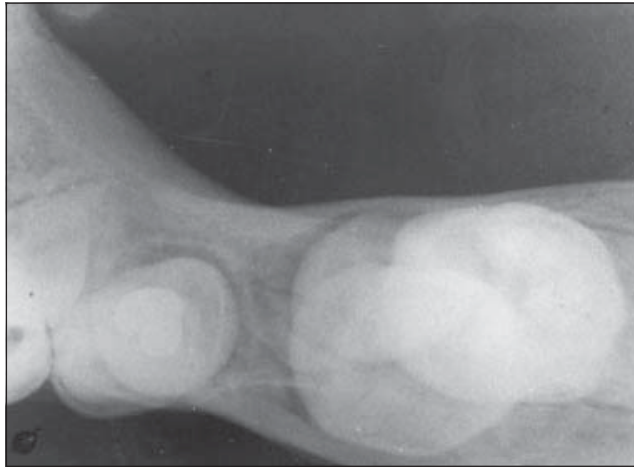


Fig 2. Occlusal radiograph of the right mandibular hemi-arch region. The second premolar is located lingually to the second primary molar causing a small bulging of the cortical bone in the lingual region.

crown of the primary tooth, may eventually continue its normal formation following the superior position of the crown of the ankylosed primary mandibular molar.^{1,5-7}

Therefore, the absence of the primary tooth observed upon clinical examination of the oral cavity during a stage when it should be present in the dental arch is a matter of concern, and the dental surgeon should make an effort to make the diagnosis.

This report illustrates a case of an impacted second primary molar positioned inferior to its succedaneous permanent tooth.

Clinical case report

Clinical examination

A seven-year-old female patient was referred to the Pediatric Dental Clinic, Dental School of Ribeirão Preto, University of São Paulo, Brazil, for routine treatment. No medical history of systemic diseases was reported by the mother. The dental

history obtained by anamnesis did not reveal dental infection or trauma. Extra- and intraoral clinical examination showed normal development of dentition characterized by the absence of the primary right second mandibular molar.

A panoramic extraoral radiograph (Fig 1) was taken to determine the chronological age of the patient and to identify dental anomalies. The patient presented normal development compatible with the chronological age of Brazilian children. Intraoral occlusal radiography of the mandible (Fig 2) was performed to support the planning of the treatment. The second premolar was located lingually, causing a small bulging of the cortical bone in the lingual region which was not clinically noticeable during palpation, as was also the case for the presence of a supernumerary tooth located above the second premolar. A periapical radiograph (Fig 3) shows the anatomical positioning of the involved teeth in detail.

On this basis, the literature was consulted to look for similar cases and to obtain orientation in terms of therapeutic conduct since this was a rare case.

Treatment

After clinical evaluation and radiography, treatment was planned. The treatment consisted of the extraction of the impacted second primary molar and the supernumerary tooth. Care was taken to maintain the integrity of the second premolar to permit its normal root formation.

The surgical procedure consisted of local anesthesia, incision, undermining of the flap, osteotomy, and removal of the supernumerary tooth. After localization of the second primary molar, horizontal tooth sectioning was performed to separate the crown portion of the root and vertical tooth sectioning to separate mesial and distal roots. Tooth remnants were removed, followed by curettage of the bone ledge to remove a fibrous capsule attached to the crown of the second primary molar, irrigation and suture.

After surgery, the patient was advised to return periodically at six-month intervals for radiographic follow-up of the rhizo-

Table 1. Cases of impacted primary molars positioned inferior to premolars

Authors	Patient Sex	Age (Years)	Reason for consultation	Local condition	Medical history	Treatment
Bateman and Emmering ²	F	14	Not reported	Continuous follicle	Absent	Not reported
Park ⁴	F	20	Pain in the left mandibular region	Not reported	Absent	Not reported
Jameson and Burke ³	F	6	Not reported dental follicle	Ankylosed Absent	Radiographic observation	
Tsukamoto and Braham ⁵	M	10	Pain in the left mandibular region dental follicle	Ankylosed Hydrocephalus	Extraction	
Present case	F	10	Routine radiographic examination dental follicle	Ankylosed Absent	Extraction of the second primary molar and the supernumerary tooth	

Table 1. Cases of impacted primary molars positioned inferior to premolars.

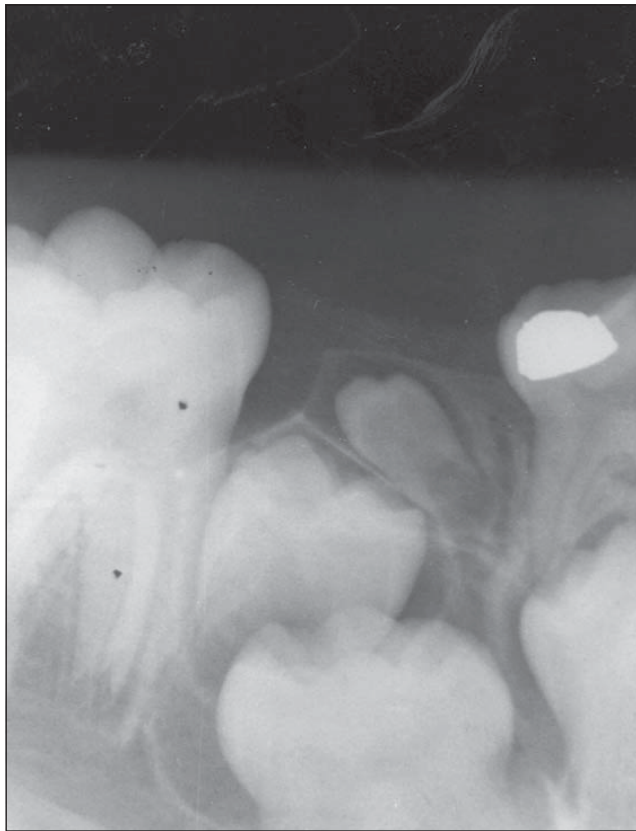


Fig 3. Periapical radiograph showing the second premolar positioned superior to the second primary molar and the supernumerary tooth above the bud of the second premolar.

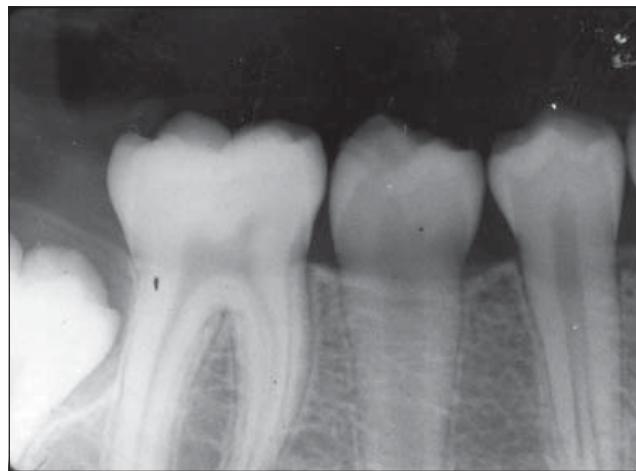


Fig 4. Periodic control radiograph taken after 2 years and 10 months showing the tooth in the oral cavity.

genesis of the second premolar. After one-year follow-up, the second premolar presented normal root development upon periapical radiographic examination. Radiographic follow-up was again performed after two years and ten months (Fig 4).

Discussion

The developmental anomaly consisting of the impaction of the second primary molar inside the bone in a position inferior to the second premolar has been reported in the literature. The

main etiologic factor is associated with early ankylosis of the second primary molar.^{1, 4, 9}

It is known that the tooth bud of the succedaneous permanent maxillary molars develops in the palatine region and that of the mandibular molars in the lingual region. After completion of calcification of the dental crown and the beginning of root calcification, the primary molars erupt actively. At the beginning of development, the premolar is found in close proximity to the roots and later, during its normal development, it is located between the roots.⁹ However, due to the onset of ankylosis in the primary tooth, the synchronized development may be disturbed and the premolar may develop lingually to the crown or eventually higher up, close to the crown of the ankylosed primary molar. Therefore, the premolar begins its development lingual to and at the level of the occlusal plane and at the end of the preeruptive phase it is found in the apical region of the roots of the primary molars.¹

One possible hypothesis explaining the variation in eruption is that the development of the primary molar bud, when associated with trauma or infection, may result in ankylosis of this tooth.^{10, 11} However, the formation and eruption of the succedaneous permanent tooth is not necessarily affected so that it can continue its normal course of eruption and can be positioned above the primary tooth. However, Black and Zallen¹² reported a case of an asymptomatic impacted second primary molar. In the present case, no trauma was observed in this region upon anamnesis or infection in the oral cavity.

Therefore, the etiology of the impaction of the second primary molar is intimately related to abnormal development of the primary molar bud before one year, or to malformation of the second premolar before one year.^{1, 6} Regarding surgical treatment, it should be considered that older patients are likely to have some debilitating health conditions that will increase the risk of surgical procedures, especially if the ankylosed tooth is located near anatomical structures such as the chin foramen or the lower border of the mandible, turning the chin nerve more susceptible to injury or causing a mandibular fracture, respectively. In younger individuals, however, if there is no prospect of satisfactory dental eruption, the tooth should be removed for prophylactic reasons, even if it is asymptomatic.¹³

In the present case, we chose a surgical treatment in which the second premolar was maintained in the intra-osseous position and only the second primary molar and the supernumerary tooth were removed. Control radiography revealed normal rhizogenesis of the premolar.

The impacted tooth is a tooth that is present inside the bone tissue but that shows alterations during eruption or is prevented from performing its activity in the oral cavity.

Lytle¹⁴ defined an unerupted tooth as a tooth that is not present and does not establish communication with the oral cavity.

Most cases of impacted teeth reported in the literature are of permanent teeth.^{9, 14-16} The absence of primary teeth occurs rarely whereas impaction of second primary molars is more numerous than all other impactions.^{8, 9, 13}

Variations in the course of premolar eruption should be mentioned but inversion of premolars and primary molars is not commonly observed. This is another example of the value of radiographic examination for the observation of occlusal development.

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ABSTRACT OF THE SCIENTIFIC LITERATURE



DENTAL AND CARDIAC RISK FACTORS FOR INFECTIVE ENDOCARDITIS

Administration of antibiotics to selected patients in an effort to prevent infective endocarditis (IE), an unusual but potentially fatal disease, is standard practice in US dental offices. Data supporting the effectiveness of this measure have been derived from anecdotal reports, studies of bacteremia following dental and other surgical procedures, and animal studies. Randomized human trials of antibiotic effectiveness in preventing IE are impractical due to the low incidence of the disease. Consequently the true risk factors of IE remain unclear.

In this population-based, case-control study involving 54 hospitals in the Philadelphia area, 273 adult patients with community-acquired IE not associated with intravenous drug use were compared with a randomized population matched by age, gender, and neighborhood of residence. Data regarding dental treatment, host risk factors, and demographic characteristics were obtained from dental records, medical records, and structured telephone interviews.

Based on the data reported, while cardiac valvular abnormalities are strong risk factors for IE, dental treatment did not appear to be a risk factor for IE even in patients with valvular abnormality. Even assuming 100% effectiveness of antibiotic prophylaxis, the authors assert that few cases of IE would be preventable by following current AHA recommendations.

Comments: This is the first controlled human study to quantify the risk for IE associated with cardiac abnormalities, with the exception of mitral valve prolapse. The finding that dental procedures were not a risk factor for IE, even in patients with cardiac valvular abnormalities, is significant and merits further investigation including child populations. In light of these findings, it would not be surprising if the American Heart Association were to further modify the Guidelines for Prevention of Bacterial Endocarditis used as the basis for clinical practice by most dentists in the United States. Until such time as these recommendations do change, dentists would be well-advised to continue to follow the Guidelines currently in force. DK

Dental and Cardiac Risk Factors for Infective Endocarditis. Strom BL, Abrutyn E, Berlin JA, Kinman JL, Feldman RS, Stoley, PD, Levison ME, Korzeniewski OM, Kaye D. *Annals of Internal Medicine* 129:761-769, 1998.