

Early ankylosis of a primary molar with self-correction: case report

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Abstract

The delayed eruption and early development of ankylosis in a single mandibular second primary molar is reported. The condition self-corrected with the eruption of the first permanent molar. This possibility should be considered in a similar situation and may be preferable to previous recommendations to remove the ankylosed tooth.

Numerous local and systemic factors have been implicated in preventing single or multiple primary teeth from erupting within a normal range of time. Local factors generally cause only one or a few teeth to be delayed while systemic causes or genetic influences may have an effect on many teeth or the entire dentition. Eruption delays in primary teeth usually can be attributed to fewer different kinds of local causes than those which can affect permanent teeth.

Worth characterized delayed primary tooth eruption as rare and attributed it to either primary molar ankylosis (osseous union of the root to alveolar bone) or to "precocious eruption of the permanent first molar" (i.e., one erupting past the height of contour of the second primary molar so as to force it apically).¹ Brearly and McKibben stated that it is rare for a mandibular second primary molar to be ankylosed before the eruption of the first permanent molar.² One study of 1042 preschool-age children found an overall incidence of 9.2% ankylosis of primary molars.³ However, only 2.1% of all possible mandibular primary second molars were ankylosed; of these, none were in the 3-year-old group, 0.2% were 4 years old, another 0.2% were 5 years old, and 1.7% were 6 years old. The study suggested a tendency for ankylosis to develop later in childhood. Ankylosis apparently is far more common in primary molars after they have

been in functional occlusion and possibly initiated some degree of root resorption.

Rule et al. reported that the incidence of ankylosis is 1-3% of children, but multiple primary teeth may be affected.⁴

Although the etiology of ankylosis in primary teeth is still unclear, several theories have been suggested: (1) a localized disturbance to the periodontal ligament, possibly from a traumatic injury, abnormal masticatory forces, or infection; (2) a congenital defect within the periodontal ligament resulting in an alteration in its metabolism; and (3) familial tendencies. Histologic evidence shows that the normally intermittent process of primary root resorption involves both osteoclastic and osteoblastic activity. In ankylosis bone deposition becomes excessive and osteoid tissue replaces periodontal ligament and joins the dentin to the alveolar bone.⁵

Clinical diagnosis of an ankylosed primary tooth may include any or all of the following: (1) a positioning of the affected tooth apical to the plane of occlusion (infraocclusion) possibly without occlusal contact; (2) decreased mobility compared to unaffected teeth; (3) altered percussion — giving a dull rather than a cushioned sound; and (4) radiographic obliteration of the periodontal ligament space suggesting direct approximation of tooth and bone.

Several treatment options have been discussed and compared for late-occurring primary dental ankylosis.⁶ One option is to extract the ankylosed primary molar with or without subsequent space maintenance depending on the proximity of eruption of the succedaneous premolar. A second choice is luxation of the ankylosed tooth in an attempt to break the bony union and allow the affected tooth to resume eruption. A restorative procedure to maintain the anky-

losed tooth's mesial-distal dimension and occlusal contact also may be a choice. A fourth possibility may be to observe the condition without intervention unless deleterious effects occur. Henderson has reported the possibility that ankylosed molars can break loose and subsequently become aligned normally.⁵

Early developing ankylosis is viewed as a condition which usually will worsen progressively. Most authorities have recommended early surgical removal of ankylosed primary teeth followed by appropriate space maintenance.⁷⁻¹¹ Postponement of removal of an early ankylosed primary molar has not been recommended routinely because later removal likely will be inevitable, and the surgical procedure may be more difficult if teeth mesial or distal to the ankylosed tooth tip into its intended space.

Case Report

A healthy, well-developed three-year-old Caucasian male with unremarkable medical and social family histories presented to a private pediatric dental practice. There was no history of orofacial trauma or unusually delayed primary incisor development. Oral examination showed a complete primary dentition, in occlusion except for the mandibular left second primary molar. Dental caries was another clinical finding but there were no other abnormal oral findings. Radiographs were not taken at the initial visit because of the child's uncooperative behavior and adequate interdental spacing to allow direct interproximal inspection. Restorative treatment consisted of 3 stainless steel crowns and 3 one-surface amalgam restorations. When the patient returned for recall evaluation 9 months later, the ankylosed tooth still had not erupted although cusp tips had erupted minimally through the gingiva (Fig 1). A periapical radio-

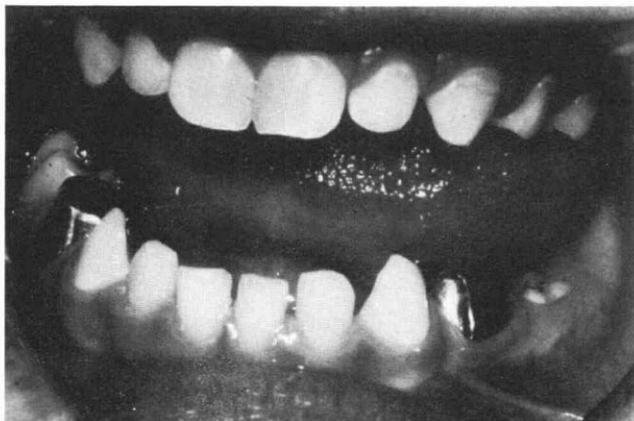


FIG 1. Intraoral view of the child's dentition at 3 years, 9 months. The left second primary molar is erupted minimally and infraverted; all other primary teeth have erupted.

graph of the mandibular left molars made at this visit (Fig 2) revealed completed root development of the ankylosed tooth, absence of a periodontal ligament space in the furcation, lack of tooth contact on the mesial and distal surfaces, and an incipiently developing crypt of the succedaneous second premolar but with no appreciable cusp tip calcification. When percussed, the ankylosed tooth did not have the same cushioned sound as the other primary molars. No treatment of the ankylosed tooth was performed at that time, although an anticipated need for treatment and potential treatment options were discussed with the child's parents.

The child was seen on a regular basis for the next 3 years with treatment consisting of coronal polishing and topical fluoride application and additional restorative care. No change in the condition of the ankylosed second primary molar was noted during this time and it remained maloccluded and only minimally erupted.

At about age 6 years, with the eruption of the lower left first permanent molar, the ankylosed primary molar erupted into functional occlusion. By age 6 years, 9 months, the clinical and radiographic presentation was almost normal (Figs 3, 4), although the primary molar appeared to be in infraocclusion. This was attributed to some degree of overeruption of the opposing tooth which had occurred during the years it had lacked an occlusal opponent. At this time no treatment was recommended except regular monitoring.

Discussion

Without histologic examination, it is not certain that the primary molar was ankylosed, but all radiographic, clinical, and historical evidence supported that diagnosis. All other possibilities in the differen-



FIG 2. Periapical radiograph of lower left quadrant at 3 years, 9 months. Absence of periodontal ligament space in furcation area is suggestive of ankylosis.

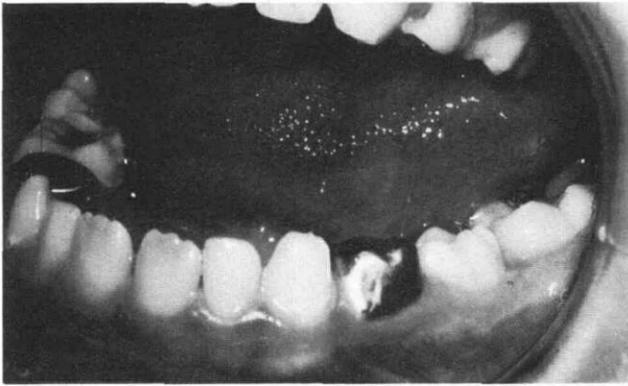


FIG 3. Intraoral view of the dentition at 6 years, 9 months. All primary and permanent teeth are in occlusion.



FIG 4. Left bite-wing radiograph at 6 years, 9 months. Periodontal ligament space and calcification of the second premolar cusp tip are visible.

tial diagnosis could be ruled out for one reason or another. For example, generalized familial delayed eruption was eliminated by history. Systemic disturbances were ruled out by the medical-dental history and general assessment. One factor which could not be judged, however, was the possibility of a differential development of secondary premolars. Serial bilateral radiographs were not available for comparison, but the second premolar on the affected side may have been delayed significantly compared to the tooth on the opposite side; this may have been a contributing factor to the ankylosis.

Dentists frequently diagnose ankylosis in the primary dentition but more typically during the mixed dentition. Several treatment options have been suggested for ankylosed molars, but many affected primary teeth eventually are exfoliated normally without any untoward consequences.¹² Early ankylosis, how-

ever, has been considered to be a more serious problem and extraction is the typical treatment recommendation. This case report is unusual for 2 reasons: (1) diagnosis was made of an ankylosed mandibular second primary molar in a 3 year old, much earlier than usual; and (2) self-correction of the condition occurred concurrently with the normal eruption of the first permanent molar.

This report further demonstrates an alternative approach to early ankylosis in that the potential for self-correction has been documented and may represent a preferable approach to the condition. Extraction requires a potentially difficult surgical experience for the young child and also brings with it a subsequent need for space maintenance. The distal guiding shoe is a commonly used appliance given the loss of a primary second molar before eruption of a first permanent molar. Unfortunately, this appliance is not without its own potential problems including: (1) the possibilities of the first permanent molar tipping over the distal extension; (2) the crypt of an underlying second permanent premolar being penetrated by the intra-alveolar extension; and (3) accelerated root resorption developing on the appliance's attachment tooth (first primary molar).¹⁴

Many dentists do not use the distal shoe appliance because of these concerns, and in the analogous situation in which a mandibular second primary molar has a necrotic pulp, a pulpectomy procedure has been recommended as a treatment preferable to the distal shoe appliance. The need to obviate the use of this particular appliance has been suggested and the avoidance of its use in this particular clinical case was intended.

It cannot be stated that every or even most instances of early ankylosis will be self-correcting. However, given a similar situation, prior to extraction of an affected tooth, the dentist should consider the possibility of eventual self-correction. Should this approach be tried, careful observation and monitoring is necessary. The primary molar should be present in the dental arch. There should be no local factors which might interfere with the primary tooth's eruption. There should be no evidence of tipping (of either a tooth to the mesial or to the distal aspect) over the marginal ridges of the affected tooth, thus "locking" it in its vertical position.

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FUTURE ANNUAL MEETINGS

1986	Colorado Springs, CO	May 24-27
1987	New Orleans, LA	May 2-5
1988	San Diego, CA	May 14-17
1989	Orlando, FL	April 27 - May 2