Reinclusion of the Primary Molar: Case Report

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ABSTRACT

Dental reinclusion, also referred to as ankylosis, retention, or infra occlusion, is a clinical condition in which a fully erupted tooth gradually moves away from the occlusal plane. The prevalence of primary molar reinclusion ranges from 1.3% to 38.5% in the population, with an unclear etiology. Reinclusion can lead to various complications, including delayed exfoliation of the primary tooth, disruption of occlusion, and improper eruption of the succeeding permanent tooth. Early diagnosis and intervention are essential to prevent these complications. In this report, we present an unusual case of severe infraocclusion of the primary maxillary right first molar in a 10-year-old child.

Keywords: Infraocclusion, Primary molars, Reinclusion, Tooth ankylosis.

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1. INTRODUCTION

Reinclusion is defined as a situation in which a tooth has completely erupted, touching the occlusal plane and then submerged again into the alveolar bone, producing the clinical aspect of infraocclusion [1]. In literature, many terms such as; secondary retention, half retention, reimpaction, reinclusion, submergence, infraocclusion and ankylosis have been used. However, the most commonly used terms are: infraocclusion, submerged tooth and ankylosed tooth [3], [3].

The reported prevalence of reinclusion varies from 1.3% to 38.5%, with a high occurrence among children aged 8–9 years old and mostly observed in the mandible arch than the maxilla [4], [5].

The etiology of this process is not completely understood, but ankylosis between the roots of the infraoccluded tooth and the surrounding bone is considered the major etiological mechanism [3], [4]. Several factors are thought to contribute to the development of infraocclusion, including genetic predisposition, deficient eruptive force, congenitally absence of the successor permanent teeth, deficiency in bone growth, excessive masticatory force, disturbance in local metabolism, local inflammation, infection, and chemical or thermal irritation [3], [4], [6], [7].

In this report, we will present a rare case of severe reinclusion of a maxillary right primary first molar.

2. CASE DESCRIPTION

A 10-year-old boy with no previous medical history was referred to our pediatric dentistry department at the Center of Consultation and Dental Treatment of Rabat-Morocco, for dental care.

The extraoral examination did not reveal any abnormalities. The intraoral clinical examination revealed that the patient was in the mixed dentition stage with multiple carious lesions in his maxillary teeth and a severe infraoccluded primary maxillary right first molar with a carious cavity. The primary maxillary right second molar and canine presented a slight convergence towards each other (Fig. 1).

According to the patient’s mother, the tooth was in good occlusion and gradually submerged into the arch.

A periapical radiograph showed that the primary molar was inferiorly positioned with root apices in close proximity to the permanent premolar successor, which presented a mesially displaced eruption path. The periodontal ligament was observable in some areas of the root surface (distal root) but difficult to discern in others (furcation) (Fig. 2).

Based on clinical and radiographic findings, the diagnosis was a reinclusion of the first maxillary right primary molar. The decision to extract the impacted tooth was taken and follow-up of the premolar eruption has been ensured (Fig. 3).

After 10 months of follow-up, there was evidence of an adequate development of the permanent successor in clinical and radiographic evaluation (Figs. 4 and 5).
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3. Discussion

Reinclusion of teeth is a condition that mainly affects primary molars. Some authors [8], [9] report that the primary mandibular first molar is most often involved, while others [10] state that it is the primary mandibular second molar. Kurol [3] reported a higher incidence of infraocclusion affecting the first primary molar in children below 9 years. After this age, infraocclusion of the second primary molar predominates.

The variety of names given to this condition reflects the confusion of thought surrounding it. According to several studies, this anomaly is consistently associated with ankylosis [9], [11], [12].

Ankylosis is defined as a fusion of cementum with alveolar bone, occurring at any time during tooth eruption [13], [14]. In some cases, the tooth may become ankylosed before emerging into the oral cavity, or during active eruption before contact is made with the opposing dentition [15].

Many classifications of infraocclusion have been described by different authors. However, Brearley and McKibben [9] proposed a simple classification based on the severity (Fig. 6).

Infraocclusion of primary molars can have significant consequences on the developing dentition. It can lead to retained primary teeth with or without a successor, delayed eruption of permanent successors, or redirecting them from their normal path of eruption. Additionally, it can lead to reduced alveolar bone support, and tipping of adjacent teeth which can result in loss of space and over-eruption of the antagonists, lateral open bite, and a higher frequency of crossbites [16]–[18].

Early diagnosis and intervention are important to minimize the impact of infraocclusion on the arch. The diagnosis typically involves a thorough dental examination, including a visual inspection and radiographic analysis.

The clinical examination can reveal a primary tooth that is below the level of the occlusal plane, and percussion test can produce a high-pitched sound, which may indicate ankylosis. However, this test is not always reliable because not all ankylosed teeth will produce a clear sound on percussion [6], [7].

On a periapical radiograph, the lack of a well-defined periodontal ligament and fusion of the root with bone can usually be demonstrated. Nevertheless, it is important to note that fusion can occur in an isolated area, often at the furcation, which means this method of detection can be challenging. A depression in the marginal bone surrounding the infraoccluded tooth can be seen, as well as the presence or absence of the permanent successor and its position inside the bone structure, which will help define the treatment plan [7], [19], [20].

In some cases, dental professionals may also use additional diagnostic tools, such as cone beam computed tomography (CBCT), to obtain a more detailed view of the affected tooth and surrounding structures [4].

Before making treatment decisions, multiple factors must be considered, including the severity of infraocclusion, the age and cooperation of the patient, the developmental stage of the root, the presence and position of the successional germ, the severity of tilting of adjacent teeth and the possibility of a follow-up. The existence of possible ankylosis associated with infraocclusion of
Fig. 4. a–b: Clinical photographs after 10 months of follow-up showing the eruption of the first permanent premolar reaching occlusal level.

the temporary molar does not influence the decision [5], [6], [21].

Fig. 5. Periapical radiograph taken after 10 months of follow-up, showing an adequate development of the succeeding premolar.

There are several treatment options available in the literature for managing infraocclusion of primary teeth. The most common treatments include monitoring, coronal reconstruction, extraction, or luxation.

Monitoring may be a conservative option in cases where infraocclusion is not affecting normal occlusion development and there is no evidence of unusual caries problems [19], [22]. In the presence of a permanent successor, most cases have been shown to exfoliate normally, with the submerged tooth roots being resorbed by the erupting successor. However, extensive bony ankylosis can prevent normal exfoliation, leading to alignment problems in the future. Some studies have found that a six-month delay in exfoliation may be acceptable, but the degree of infraocclusion and the extent of the delay can impact the outcome. It is crucial to keep the tooth under regular radiographic monitoring of normal root resorption [23], [24].

Restoration of occlusal height is another conservative treatment option, particularly indicated in cases of mild to moderate infraocclusion, aiming to restore function, prevent tipping of the adjacent teeth, and over-eruption of the antagonist. It can be performed with a composite resin buildup of the occlusal surface or a stainless-steel crown. Moreover, placing a crown preserves the mesiodistal dimension [4], [20].

Extraction should be considered when severe infraocclusion with adverse occlusal changes, prolonged retention and ectopic eruption of the permanent successor or caries and abscess formation are observed [6], [23], [25]. However, it is important to place a space maintainer to prevent space loss before the procedure, with constant clinical and radiographic control until the successor tooth erupts in the dental arch [4].

Based on the severity of reinclusion, the patient’s age, evidence of tooth decay, the abnormal development of the patient’s permanent successor tooth, and the presence of the first left premolar in the arch, extraction was the preferred treatment approach for this case.

Fig. 6. Brearley and McKibben classification based on the severity of infraocclusion [9].
Alternatively, luxation is another viable treatment option for infraoccluded primary teeth presenting ankylosis. Biederman [26] and Skolnick [27] have reported the efficacy of luxation in breaking the bony union between the alveolus and the ankylosed tooth allowing continued tooth eruption. If the first attempt is not immediately successful, the technique can be repeated six months later [6], [22], [28].

In cases of slight or moderate infraocclusion with premolar agenesis, if the decision is made to keep the tooth on the arch, restoration of its occlusal height should be planned. However, in cases of severe infraocclusion, extraction is indicated, followed by either space closure or space maintenance for future prosthetic rehabilitation. These decisions must be made in coordination with the orthodontist [25], [29].

The optimal treatment strategy will vary depending on the individual characteristics of each case.

4. Conclusion

The prevalence of reinclusion among children is not negligible. Early diagnosis, appropriate intervention and regular monitoring may prevent complications and achieve favorable treatment outcomes.

Conflict of Interest

Authors declare that they do not have any conflict of interest.

References