

Primary failure of eruption in permanent first molar treated surgically - A case report

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Abstract

Primary failure of eruption (PFE) is a cessation of tooth eruption before emergence, despite the presence of clear eruption pathway. It is a rare disease with a prevalence of 0.06%. However, Decker et al showed that the genetic mutation in PTH1R gene is associated with primary failure of eruption. This case report is about a nine years old female patient who reported to the Department of Pediatric Dentistry, Pakistan Institute of Medical Sciences (PIMS), Islamabad, with primary failure of eruption of right mandibular 1st permanent molar which was incidentally found on OPG, with a completely erupted left 1st permanent molar. Treatment commenced after one year of patient's initial presentation with no progress in eruption. The affected tooth was marsupialized completely including the removal of the dental sac and coronal bone. After the follow up period of 4 months tooth eruption was evident. Further follow up of 8 months revealed complete tooth eruption.

Keyword: Deciduous, Primary eruption, Molar, Surgical.

Introduction

Tooth eruption is an intricate process defined as the movement of a tooth from its site of development within the alveolar process towards its functional position in the oral cavity.¹ Failure of tooth eruption in the absence of any obstruction in the eruptive pathway can be recognized by the lack of inherent eruptive potential of the tooth, termed as Primary Failure of Eruption (PFE).² The etiology of primary failure of eruption is unknown, however, genetic disturbances associated with mutations in parathyroid hormone receptor 1 (PTH1R) have been noticed.³⁻⁵ This is a rare condition having main characteristic features of failure of an affected tooth to erupt along its eruption path or partial eruption. They are not ankylosed and teeth that are distally placed to the most mesially affected tooth are also affected. It can affect all the posterior quadrants with a clinically distinct unilateral appearance and posterior open bite. The teeth do not respond to orthodontic treatment and therefore the affected teeth cannot be moved into their correct positions.⁶ Early diagnosis and management can result in prevention of eruptive failure and attainment of normal occlusion. Other treatment options include surgical repositioning of the affected dento-alveolar segment or prosthodontic management for the un-erupted teeth and overlay crowns in mild case.⁷

Case Presentation

A nine years old female patient reported to Department of Pediatric Dentistry, Shaheed Zulfiqar Ali Bhutto Medical University (SZABMU), Pakistan Institute of Pakistan Sciences, (PIMS), Islamabad, for treatment of her carious mandibular left permanent 1st molar. While examining the patient, it was observed that her right 1st permanent mandibular molar was absent (Fig. 1). To evaluate further, an OPG was advised, which showed that her right 1st permanent molar was unerupted along with the presence of a large radiolucent area around the crown (Fig. 2). Intraoral

examination revealed mixed dentition stage with rest of the permanent first molars erupted. Her medical history was unremarkable and she did not have a familial history of non-eruption of teeth. No physical abnormality was present.

Affected tooth was at lower level than adjacent mesial and distal tooth. The patient was put-on follow up for a period of one month with a three months interval, to avoid inadvertent trauma to the adjacent tooth (premolar), but no progress in eruption was seen. After that, a localized osteotomy was planned for the affected site and treatment started with the surgical exposure of involved area followed by the removal of dental sac and curettage of the lesion under local anesthesia (1.8ml of 2% lignocaine with 1:100,000 epinephrine). Localized osteotomy was done along with the marsupialization as suggested by Ahmed et al.⁶ Patient was recalled on 7th day for evaluation and removal of sutures. Healing was adequate and patient was asymptomatic as well. Semi-rigid splinting was done on the maxillary antagonist tooth to prevent supra-eruption and patient was kept on monthly follow-up.

The affected tooth showed slight eruptive movement after 4 months but due to distal shift of the crown of adjacent second premolar, the eruption progress was not remarkable. To create a space for the eruption of affected tooth, the affected site was again surgically explored and separators were passed between the affected tooth and 2nd premolar. The separators were changed after every seven days for four weeks and hence the space was created, and the patient was again kept on follow-up.

Clinically and radiographically eruption of the affected tooth becomes visible at the 8th month from the start of treatment. At this time point the tooth was almost at the normal occlusal level (Fig. 3 & 4).



Fig. 1: pre-operative intraoral picture of a 9 years female showing fully erupted lower left permanent first molar and unerupted lower right first permanent molar



Fig. 2: OPG of a 9 years female patient showing primary failure of eruption on right side with marked radiolucency surrounding the affected tooth



Fig. 3: showing fully erupted lower right permanent first molar



Fig. 4: showing fully erupted lower right permanent first molar radiographically

Discussion

Primary failure of eruption (PFE) is a rare condition characterized by non-syndromic eruption failure of permanent teeth in the absence of mechanical obstruction as originally described by Proffit and Vig.² In the present case there was an early diagnosis of PFE at the age of nine years in mandibular right 1st permanent molar. The tooth was absent clinically and the radiographic examination showed that the crown of the affected tooth (mandibular right 1st permanent molar) was surrounded by a radiolucency and it was situated at a lower level than adjacent teeth. Several other studies also shows the same clinical features of primary failure of eruption^{3,6} Rasmussen and Kotsaki (1997) evaluated 5 cases with inherited retarded failure of eruption in the permanent as well as primary dentition, however in the current study it involved permanent tooth only. They evaluated PFE in many patients and reported that there were no significant differences between gender, jaws, right/left sides. They further stated that the unerupted teeth always seated deeply-beyond their normal position of eruption as it happened in the present study.

The diagnosis and management of PFE is difficult because of its rare prevalence and late diagnosis followed by orthodontic treatment results in ankyloses of the affected tooth which further complicates the procedure thus interrupting normal eruption pattern.² but early diagnosis of PFE i.e during the stage of developing dentition enables a clinician to abandon orthodontic means doomed to failure. Other prosthetic and surgical treatments can be done such as prosthetic replacement of the affected tooth after surgical extraction. For isolated teeth with primary failure of eruption, extraction is also an option followed by replacement with prosthesis or orthodontic space closure.⁸ In the present case, treatment was done as described by S. Ahmed et al which includes marsupialization followed by localized osteotomy.

In other cases, as literature suggests, tooth eruption occurs but not up to the occlusal level.³ However, in the present case, complete tooth eruption occurred till up to the occlusal level after six months of the procedure highlighting the importance of the early diagnosis and surgical management of PFE.

Conclusion

If case of primary failure of eruption is recognized early and managed properly, then the need of prosthetic replacement and extraction is not needed and affected tooth can be brought up to the proper anatomical position.

Conflict of Interest: None.

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