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Treatment of Space Loss Caused by Submerged Mandibular Second Primary Molar

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ABSTRACT

Submersion is a clinical term describing a tooth depressed below the occlusal plane. In this case report, we present treatment of a patient who had totally submerged primary maxillary second molar, which caused impaction of the second premolar and space loss in the maxillary arch due to tipping of adjacent teeth. A 19 yr old female was referred to the Department of orthodontics. Intraoral examination revealed left mandibular second primary molar was localized lingually being almost covered by gingiva and adjacent teeth inclined closing the space of the related tooth completely. Panaromic radiograph demonstrated that mandibular second premolar was impacted. Based on clinical and radiographic findings mandibular primary second molar was extracted. A pre- Adjusted Edgewise appliance (MBT prescription 022" slot) was used for creating space for the impacted second premolar. Eruption began spontaneously 6 months later.

KEY WORDS: *Submersion, primary molar, Impaction*

INTRODUCTION

Submergence is a term defining a tooth that remains below the occlusal plane. Dental ankylosis is thought to be major etiological mechanism of submergence[1-6] . Studies report prevalence rates of submerged primary teeth to be from 1.3 to 8.9 % of the population with a significantly higher incidence between siblings [4-8] . Generally , primary mandibular molars are affected more than 10 times as often as primary maxillary molars.

Submerged primary molars may cause several problems in dental arch such as space loss, tipping of adjacent teeth, supra – eruption of the antagonists dislocation permanent teeth lying under primary tooth.

In this case report, we present the treatment of a patient who had totally submerged mandibular second primary molar, which caused impaction of the second premolar and space loss in the mandibular arch due to tipping of adjacent teeth.

Case report

A 19 yr old female was referred to the Department of orthodontics when she noticed submerged primary left mandibular second molar tooth that erupted at the level of permanent mandibular left first molar. She also complained of pain in the lingual side of the tooth. Medical history was non- contributory. The Dental history did not reveal any dental infection or trauma. Extra oral examination revealed a straight profile with reduced lower facial height.

Intra oral examination showed normal development of dentition except the abnormal eruption of primary mandibular left second molar and absence of mandibular left second premolar. Primary mandibular left second molar could barely be detected at first examination it was localized at the lingual side of posterior mandibular alveolar process near lingual sulcus and almost completely covered by gingival. Although the contralateral side revealed a class I Molar relationship there was malocclusion because the adjacent teeth inclined closing the space of the related teeth completely. There was mild crowding of lower anteriors with

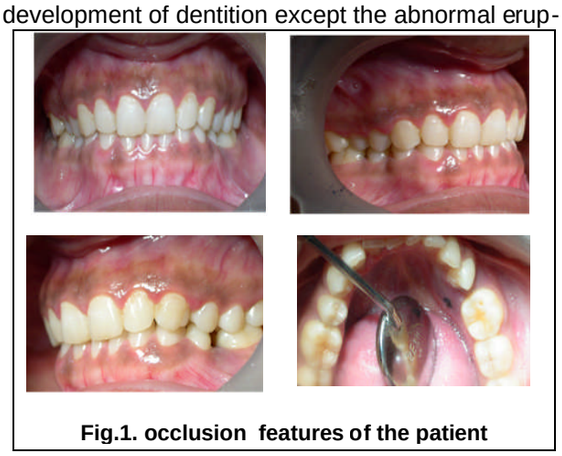

Fig.1. occlusion features of the patient

deep bite and mild attrition of lower anterior teeth. Upper anteriors were retroclined **(Fig.1)**

The panoramic radiograph was taken to determine the presence and position of mandibular left second premolar tooth. Radiograph showed that the primary mandibular left second molar submerged in alveolar bone. There was an unerupted mandibular second premolar, fully developed and distally incliled. Premolar was located below the submerged primary tooth. **(Fig.2)**

Fig.2. OPG radiograph of the patient

Based on clinical and radiographic findings the submerged primary molar was extracted surgically. A pre- adjusted edgewise appliance (MBT prescription 022" slot) was placed in the upper arch initially. Leveling and alignment was accomplished through sequential increase in arch wire from 016" Nitinol arch wire to 019" × 025" Nitinol wire for three months. Then appliance was placed in mandibular arch Leveling and alignment was accomplished through sequential increase in arch wire from 016" Nitinol arch wire to 019" × 025" Nitinol wire for three months. A 019" × 025" SS wire placed in upper and lower arch Nitinol open coil spring was placed between mandibular first premolar and first molar to create space for the second premolar. The cusp tip of the impacted second premolar was seen after five months.**(Fig.3)** Once freed to erupt normally the previously impacted tooth appeared to float upward like a cork. After six months the second premolar erupted into occlusion without applying any force onto it once into occlusion a bracket was bonded to it for detailing and finishing of the case. **(Fig.5,6 and 7).**The patient was co- operative and the appliances were removed 19 months after initiation of treatment.

Discussion

Up to now various reasons were reported for submerged teeth[1,2,9] . The most frequently stated cause of this phenomenon is ankylosis , that is, the fusion of the tooth with the surrounding bone[1,9] a genetic input has also been suggested based on observation in several members of the same family [4,5] . The Dental, Medical and familial history of our patient did not contribute to explain the reason of submergence.

It is established in dental literature that the treatment plan of a submerged primary tooth depends on degree of abnormality, the presence of its successor permanent teeth and time of onset[1,2,9,] .

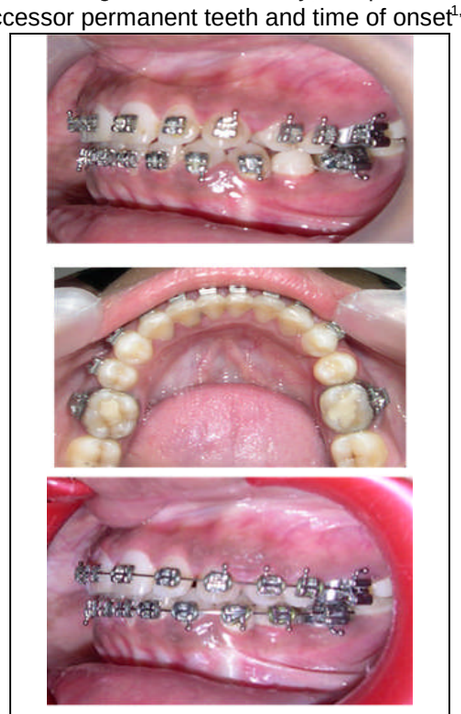

Fig.3. Orthodontic appliance in place

. The simplest classification [9] of this abnormality be described as slight, moderate and severe, seems to be the most useful to the clinician which is ' Slight' defined as between occlusal surface and the proximal contact, 'moderate' being within the occlusal –gingival dimensions of the inter-proximal contact point and severe being anywhere below the inter –proximal contact point. The related tooth of our patient remained under the cervical regions of adjacent teeth. It was a severe submersion case according to author's classification and the treatment was planned based on this finding.

Most submerged primary molars with a permanent successor have been shown exfoliate normally by the erupting successor resorbing the area of fusion however extensive bony ankylosis may prevent normal exfoliation, causing future alignment problems[2,10]. Studies note a six months delay as an acceptable exfoliation schedule for

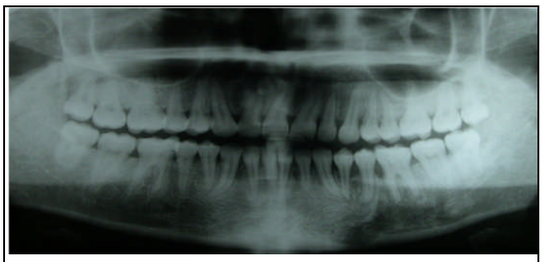

Fig.4. OPG radiograph of the patient after treatment

ankylosed primary molars and that degree of infra – occlusion is not related to time of delay.[2,5,10] In case of severe submersion, clinical disturbances may include incomplete alveolar process development, lack of no mesial drift, non – response to orthodontic forces, retained primary teeth with or without a successor and impaction of the successor, a depressed tooth with tipped adjacent teeth, supra – eruption of opposing teeth, lateral open bite and higher frequency of crossbites. [1,2]. According to kurol and Thilander[10], these disturbances have no long –term effects on occlusion. On the contrary, Backer and shochat [11] and karnei- Reem[12] notify

Fig.3Finishing and detailing of the case

that they have detected a significant deviation of the dental inter – incisor midline towards the affected side. In this case submerged mundibular second primary molar impacted its permanent successor because of space loss, the adjacent teeth inclined closing the space of related to completely malocclusion occurred at the affected side.

The main purpose of submerged primary molars with successors is to allow the normal eruption of the successor.[13] The first decision is to determine the times of onset. Late onset cases usually are in slight infra –occlusion, hence, treatment objectives are focused on exfoliation of the ankylosed tooth. Early onset cases divided into those diagnosed early and those diagnosed late. Late diagnoses of onset conditions are likely to present with tipped adjacent teeth, supra –eruption the antagonist and therefore indicate orthodontic intervention.

The present case was a rare early onset late diagnosed case. Treatment was planned based on findings, after extraction of submerged tooth orthodontic procedures applied to regain space for the successor premolar tooth. After regainment of lost space, the mandibular second premolar erupted spontaneously.

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