

Management of Unerupted Central Incisors : A Case Report

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Abstract

Unerupted or clinically missing maxillary incisors can have a major impact on dental and facial aesthetics of an individual. Delayed eruption of both the primary and permanent teeth can occur owing to mucosal barriers in the path of eruption. Formation of a dense mucoperiosteum or submucosa acts as a physical barrier to eruption during the development of tooth or following surgery. While supernumerary teeth are the most common cause of delayed eruption of maxillary incisors, eruption failure can also be caused by tooth malformation, dilacerations or pathological lesions. The functional problems associated with missing anterior teeth are speech difficulties, particularly with the 's' sound. As missing upper incisors are regarded as unattractive this may have an effect on self-esteem and general social interaction. Hence early intervention is important to detect and manage the problem. Either an open exposure or closed eruption procedure can be employed to promote eruption of the unerupted maxillary incisors. The open exposure of an unerupted maxillary incisor by means of a simple elliptical incision of the overlying soft tissue is rarely indicated but may be useful when there is a soft tissue impaction as in this case with the tooth occupying a very superficial position. In the present case report a 11 year old boy reported with chief complaint of unerupted upper

front teeth which was surgically exposed and orthodontically corrected based on history after thorough clinical and radiographic evaluation.

Keywords: Unerupted central incisor, missing teeth, impacted incisors, 2x4 appliances

Introduction

Many patients with unerupted maxillary central incisors are referred to paediatric dentists or orthodontists by general dental practitioners, because parents are concerned about a missing incisor in the early mixed dentition, even though its occurrence is less frequent (Lin 1999; Becker 2002)¹ The frequency of maxillary central incisor impaction has been found in the range of 0.03–1.96 % (Mead 1930; Grover and Lorton 1985). The anterior maxilla is a highly demanding aesthetic area and consequently treatment of unerupted maxillary incisors requires a well-synchronised and multidisciplinary approach to obtain an acceptable aesthetic and functional result as soon as possible.

A comprehensive evaluation must include assessment of whether space is available or can be made available in the arch for alignment of the unerupted teeth, patient's age and dental developmental stage, timing of surgical intervention, length and cost of treatment, oral hygiene status and others.² There are several treatment options open to a patient with an unerupted permanent incisor.

The most conservative management would be the extraction of any obstruction, the creation of space and the observation for spontaneous eruption (Huber et al. 2008). In many cases surgical exposure of the unerupted teeth and orthodontic traction into the line of occlusion is the most indicated approach (Ferguson 1990). Surgical procedures involve either exposure and packing of the area prior to placing an orthodontic attachment in a later visit or a one-step exposure and orthodontic attachment placement using a fully repositioned mucoperiosteal flap (Bishara 1992).³

Case Report

A 11 year old boy attended to the department of Paedodontics and Preventive Dentistry, Mahe Dental College with the chief complaint of unerupted upper central incisors (Fig 1 & 2). As reported by the parents, the teeth had never erupted, and they could not recall any trauma to the oral cavity or the head and neck region. The boy had no significant medical problems reported. The patient was not taking any medications. There was no history of caries or intraoral infection.

Extraoral examination revealed no abnormal signs, no asymmetry and no lymphadenopathy. The intraoral examination showed mixed dentition stage, where all the primary teeth were present except the maxillary central incisors and the mandibular central and lateral incisors (Fig:2).

Anterior occlusal and orthopantomogram were taken which revealed the presence of the incisors with more than 2/3 of the root formation completed. (Fig:3, Fig:4). No odontomes and no supernumerary teeth were present radiographically and there was no presence of calcification or bone abnormalities.



Fig 1 & 2: Unerupted incisors



Fig 3: Maxillary occlusal radiograph



Fig 4: Panoramic Radiograph

Considering the age of the child, the position of the central incisors, aesthetic requirement of the parents and child, developmental stage of the permanent central incisors, and more importantly the psychological status of the child, it was decided to surgically expose the permanent central incisors with orthodontic traction under local anaesthesia. There was a very little chance for normal spontaneous eruption of the tooth since the child was already aged 11 years and also because it appeared that the maxillary lateral incisors had erupted.

The patient was very cooperative, so the surgical procedure was planned under local anesthesia. A full thickness mucoperiosteal flap on the labial side was reflected. After careful elevation the unerupted central incisor teeth was exposed. The labial mucoperiosteal flap was repositioned and adequate amount of crown was exposed for bonding of the orthodontic bracket.

(Fig 5)



Fig.5: Exposed central incisors



Fig. 6: Placement of Begg's brackets

Fig 7 & 8: Ligation wire incorporated into brackets attached to 2x4 appliances.

A flat Begg's bracket was bonded on the labial surface of the unerupted incisors for traction. (Fig:6) Orthodontic Ligation wire was twisted and made into a hook form and attached to the brackets and the distal end of the ligation wire hook was suspended in the oral cavity to attach 2X4 appliance, making sure the occlusion was not interfered (Fig 7 and Fig 8). After a week, the healing was normal and the sutures were removed. In the subsequent visit, a 0.022 inch pre-adjusted edgewise bracket was bonded to the patient. For initial alignment and leveling, a 0.016 inch stainless steel wire was placed. The traction was applied with the help of the ligation wire tied to the permanent maxillary central incisors in the subsequent visit until it erupted to the occlusal plane. (Fig 9) Then Begg's bracket of the unerupted central incisors were replaced with the MBT bracket (Fig 10). After initial alignment and leveling, a 0.016 × 0.022 inch NiTi wire and 1 month later a 0.016 × 0.022 inch stainless steel wire was placed for two months for obtaining incisor alignment to the level of the adjacent lateral incisors



Fig 9: Continued orthodontic traction



Fig 10: MBT brackets placed



Fig 11: Stainless steel arch wire placed.



Fig 12: Levelling & alignment of 11 and 21 at the level of adjacent lateral incisors

Discussion

A delay in eruption specific to the permanent incisors may result from retained primary incisors. This may be caused by the primary tooth becoming ankylosed or nonvital, due to trauma or caries. If the primary roots cannot be resorbed for any reason, the permanent tooth may erupt in an alternate path or not erupt at all. Delayed eruption of both the primary and permanent teeth can also be owing to mucosal barriers in the path of eruption. Formation of a dense mucoperiosteum or submucosa that acts as a physical barrier to eruption can occur during development or following surgery.

While supernumerary teeth are the most common cause of delayed eruption of maxillary incisors, eruption failure can also be caused by tooth malformations or dilacerations. Dilacerations occur after trauma to a primary tooth, where the developing permanent tooth bud is damaged due to close proximity to the primary tooth. For this reason, both tooth malformations and dilacerations are more common in the permanent dentition.

Eruption failure may also occur if cysts or other pathological obstructions develop in the eruptive path of the incisors. Pathological lesions can occur on the deciduous predecessor or on the permanent tooth itself.

The most common developmental lesion encountered in the anterior maxilla, affecting the eruption pattern of the incisors, is the dentigerous cyst.

Either an open exposure or closed eruption procedure can be employed to promote eruption of the unerupted maxillary incisors.

The closed eruption technique has been favoured by many clinicians who claimed that the aesthetic and periodontal outcome is far more superior when compared with the apically positioned flap^{4,5}. If the tooth is impacted in the middle of the alveolus or high in the vestibule near the nasal spine, the closed eruption technique may be the treatment of choice. Some teeth are impacted at a higher level in the vestibule that an apically positioned flap is difficult or impossible to employ⁶. The results of treatment included an intact, properly functioning occlusion, pleasing esthetics, as well as healthy periodontal supporting tissues⁷

The open exposure of an unerupted maxillary incisor by means of a simple elliptical incision of the overlying soft tissue is rarely indicated but may be useful when there is a soft tissue impaction with the tooth occupying a very superficial position.

Here in our case, a thick mucoperiosteal flap was raised and Begg's brackets were attached to the crowns of 11 and 21 with a ligature wire tied. Flap was closed with sutures. After a week, sutures were removed. 2x4 appliance⁸ was attached to the maxillary arch and traction was done in 11 and 21 till it erupted into the oral cavity. In subsequent visits, traction was continued till 11, 21 erupted into normal occlusion. Begg's brackets were replaced with straightwire brackets. Within 3 months, 11 and 21 erupted into the normal occlusion.^{9,10}

Conclusion

Unerupted or clinically missing maxillary incisors can have a major impact on dental and facial aesthetics of an

individual. As missing upper incisors are regarded as unattractive, this may have an effect on the self-esteem and social well-being of the individual. Some speech difficulties associated with missing upper incisors have been reported. Thus, it is important to detect and manage the problem as early as possible to achieve a functioning dentition and a pleasing appearance. Early diagnosis is essential for a successful outcome and reduces the necessity for appliance therapy in some cases.

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