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Case Study

Early Identification, Localization and Surgical Management of Impacted Mesiodens: A Report of Two Cases in Children

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ABSTRACT

Mesiodens is a type of supernumerary tooth that occurs in the midline region in the maxilla, between the two central incisors. They may erupt in the oral cavity or may remain impacted. Their presence may cause food lodgement, difficulty in maintaining sufficient oral hygiene, difficulty or delay in the eruption of regular teeth, tendency to develop cysts, compromised aesthetics, etc. The objective of this article is to show the importance of early identification of supernumerary teeth, proper treatment planning and correct surgical approach to help in the preservation of normal teeth and adjacent structures. This paper gives an account of two clinical cases of mesiodens in two male children, who presented with the complaint of malalignment of upper front teeth. Clinical and radiographic examinations revealed the presence of a supernumerary tooth in the premaxillary region. The treatment plan aimed at the correct localization and removal of the supernumerary teeth in both the cases followed by continuous follow up at recall visits.

INTRODUCTION:

The extra teeth present in addition to the normal dentition constitute supernumerary teeth, a condition called hyperdontia. The first case of supernumerary tooth had been found around 23–79 AD. The mesiodens is the commonest form of supernumerary teeth frequently found in the maxillary arch [1]. In 1917, Balk gave the term "mesiodens" which indicated a supernumerary tooth present mesial to both central incisors, which may appear peg shaped with either normal or inverted position. Two types of mesiodens are found depending on their size and shape. The first type is eumorphic tooth which has a regular morphology similar to the central incisor while the second type is dysmorphic tooth which has different shapes and sizes and are further classified into supplemental, odontome, conical, and tuberculate variety [2].

There are several theories which suggest the occurrence of supernumerary teeth like phylogenetic reversion, dichotomy of a tooth germ or hyperactivity of the dental lamina. The genetic factors may also influence the presence of this anomaly [3-7]. Several studies have shown that there is a twice more predilection in the occurrence of mesiodens in males than in females [3, 4, 8, 9, 10, 11]

Many complications can be associated with supernumeraries, like impaction, delayed eruption or ectopic eruption of adjacent teeth, crowding, development of median diastema and eruption into the floor of the nasal cavity. They may also cause formation of follicular cysts with significant bone destruction and root resorption of the permanent incisors. [12, 13] When any of the above complications occurs or is anticipated, surgical removal of the supernumerary tooth is indicated.

This paper presents a report of two cases of twin mesiodens with negative family history for supernumerary teeth and the absence of any syndromes. It is an effort to explain the diagnosis and management of mesiodens along with the complications associated with them.

Case No. 1:

A nine-year-old male patient reported to the Department of Pedodontics, with the chief complaint of malalignment in relation to upper front teeth **[Figure 1].** Upper and lower alginate impressions were taken and diagnostic casts were prepared **[Figure 2]**, which showed that maxillary permanent central incisor was rotated and a mild bulge was visible behind the right central incisor on the palatal side. The remaining dentition was in normal alignment and shape. No abnormality was noted in the gingiva and alveolar bone. The family and medical histories were non-contributory. Also, no caries or intraoral infection was present. An IOPA was taken and accidentally an inverted impacted mesiodens was found behind the right central incisor **[Figure 3].** After that an occlusal radiograph was taken to confirm the position of both the mesiodens **[Figure 4]** along with the use of SLOB technique (Clark's's rule). Both methods suggested that the mesiodens was palataly placed **[Figure 5].**

Considering the age and co-operation of the child, and the position, location and developmental stage of the impacted mesiodens, it was planned to carry out the treatment in two phases: first to remove the erupted conical mesiodens followed by surgical removal of impacted inverted mesiodens. Informed consent was taken from the child's parents and the erupted mesiodens was removed under local anesthesia (Lignocaine with Adrenaline 1:100,000), without any complications **[Figure 6]**. After that, a crevicular incision was given and a palatal flap was raised **[Figure 7].** After locating the impacted mesiodens, **[Figure 8]** minimal bone was cut and the impacted mesiodens was removed **[Figure 9]**. The flap was relocated and interrupted sutures were placed for a week. After 10 days, sutures were removed and patient was recalled after four months for follow up **[Figure 10 and 11]**.

Fig 1: Pre-operative photograph of the patient

Fig 2: Diagnostic cast of the patient

Fig 3: Pre-operative IOPA

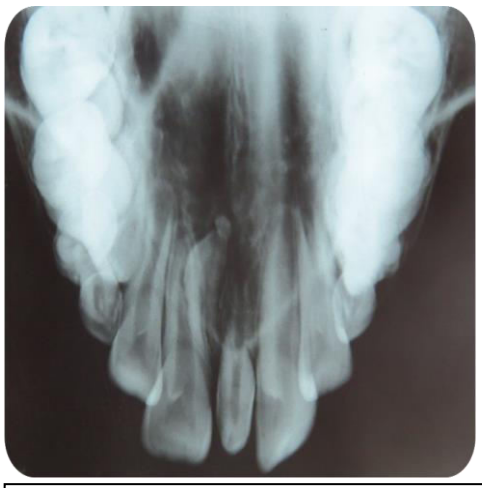


Fig 4: Pre-operative occlusal radiograph

Fig 5: Clarke's Method. Left side: Normal IOPA, Right side: Tooth moving towards the distal side after distalization of cone.

Fig 6: Removal of erupted mesiodens

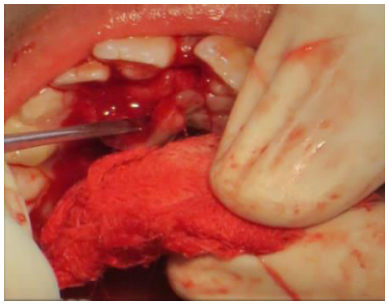


Fig 7: Envelope flap raised during removal of impacted mesiodens

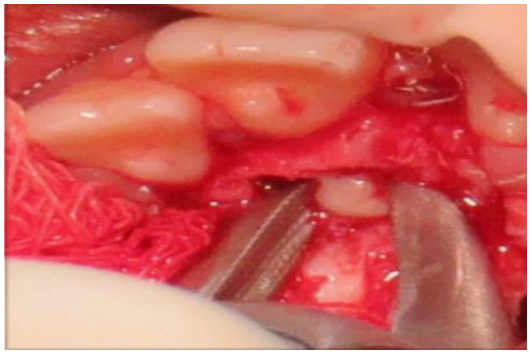


Fig 8: Locating the tooth during removal of impacted mesiodens

Fig 9: Removed impacted mesiodens

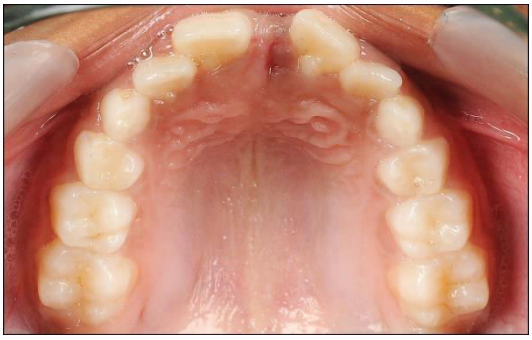


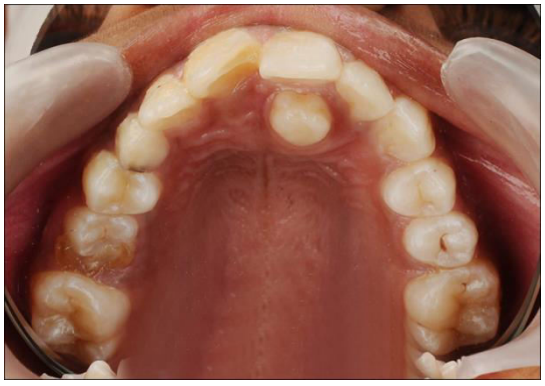
Fig 10: Post-operative photograph after removal of both mesiodens

Fig 11: Post-operative radiograph after removal of both mesiodens

Case No. 2:

An eleven-year-old patient presented to the department with chief complaint of extra tooth in upper front region of mouth causing disfigurement **[Figure 12]**. A thorough examination was conducted where medical history and family history was not significant. Clinical examination revealed the presence of a conical mesiodens palatal to left central incisor, displacing it labially. Periapical radiograph **[Figure 13]** and OPG **[Figure 14]** were taken to rule out the possibility of multiple supernumerary teeth. To our surprise, another unerupted impacted mesiodens was present in the palate, just behind the right central incisor. The axial slice image of CBCT revealed the palatal position of the impacted mesiodens **[Figure 15]** and the sagittal slices showed that the supernumerary tooth was in palatal position over the permanent maxillary central incisor **[Figure 16]**.

The extraction of both mesiodens was planned. The extraction of erupted mesiodens was carried out followed by surgical removal of the impacted one. The palatal flap was raised from distal aspect of first premolar on right side to distal aspect of canine on left side **[Figure 17]**. After locating the crown, with minimal bone cutting, extraction of the mesiodens was done **[Figure 18]** and sutures were placed **[Figure 20]**. Patient was recalled for follow up after 15 days; and excellent healing was observed.



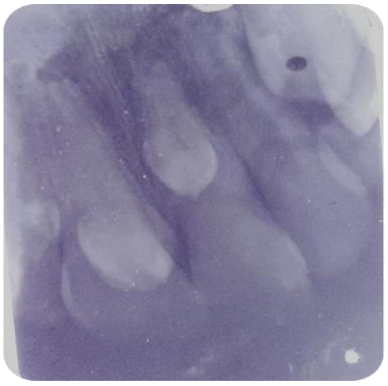


Fig 12: Pre-operative photograph

Fig 13: Pre-operative IOPA

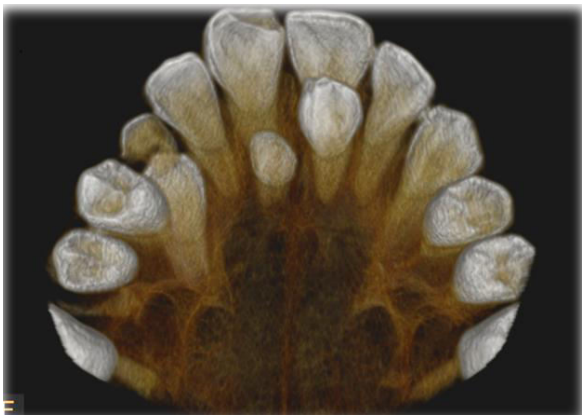


Fig 14: Pre-operative OPG

Fig 15: Pre-operative axial slice image of CBCT

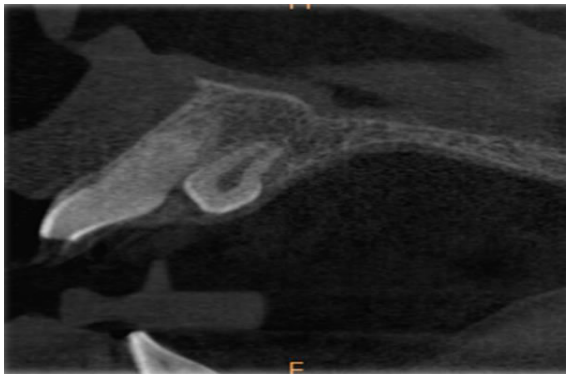


Fig 16: Pre-operative sagittal slice image of CBCT

Fig 17: Surgical procedure showing location of both mesiodens

Fig 18: Photograph showing extracted mesiodens

Fig 19: Post-operative photograph of tooth socket

Fig 20: Photograph showing interrupted sutures with diastema formation

DISCUSSION:

Hyperdontia is a developmental anomaly which results in an increase in the number of teeth in the dental arch [14], with a prevalence of 0.15% to 3.9% [10]. Inverted mesiodens is a supernumerary tooth that occurs along with the maxillary central incisors, with an inverted position. There are three common forms of supernumerary teeth: ordinary, inverted and horizontal. According to the literature, an inverted mesiodens is present most commonly in the maxilla [14], with a prevalence of 1.5% to 1.9% in the anterior region [10]. The most common causes for alteration in the position are cysts and tumors, trauma, cleft lip and palate and genetic factors [5]; none of these anomalies were found in the cases presented in this paper. As per literature, there are many theories responsible for hyperdontia like phylogenetic reversion, hyperactivity of the dental lamina [12], dichotomy of a tooth germ [9], etc.

It is very important to identify and locate the mesiodens, and plan the correct treatment after using various radiographs, so as to carry out the surgical procedure safely and reduce post-operative complications as well as damage to permanent tooth. [7-13,11-17,15,16]. In the first case, IOPA, occlusal radiograph and Clark's's Technique were used to locate the correct position of the inverted mesiodens. In the second case, OPG and CBCT were used which provide conservative and safe planning for the surgical procedure [16].

Their characteristic clinical and radiographic presentation facilitates easy diagnosis. CT-scan is of great help in planning the surgical procedure [18]. In both the present cases, complications associated with the supernumerary teeth were delayed eruption of permanent central incisor and and subsequent crowding in upper arch. There are two methods for extraction of mesiodens: early extraction before root formation of the permanent incisors and late extraction after root formation of the permanent incisors [19]. Some authors recommend extraction of mesiodens in the early mixed dentition period in order to facilitate spontaneous eruption and alignment of the incisors [20-22], which may reduce the need for orthodontic treatment. A controversy exists in the literature regarding the time of removal of an impacted mesiodens. The immediate versus delayed surgical intervention following root development of the central and lateral incisors, around the age of eight to ten years has been mentioned [23]. It might take six months to three years for an unerupted tooth to erupt after removal of the mesiodens [24]. Henry and Post [25] suggested delayed extraction of the mesiodens around the age of ten years, when the apex of the central incisor is formed. More complex surgical and orthodontic procedures may be required if the treatment is postponed after this age. The type and position of the unerupted tooth, the stage of root development and the space available in the dental arch may influence how long it takes for a normal tooth to erupt after surgical removal of the mesiodens. A recent study by Yagüe-García et al. [26] emphasized that the early removal of the supernumerary teeth is the treatment of choice in order to prevent complications.

CONCLUSION:

The potential complications associated with supernumerary tooth can be minimized with early diagnosis and prompt surgical treatment. It is the clinician's duty to recognize the signs which suggest the presence of supernumerary tooth, irrespective of its etiology. Extraction during the mixed dentition period results in spontaneous alignment of the adjacent tooth leading to

improvement in the patient's aesthetics and self-esteem.

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