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Surgical Management of Palatally Impacted Mesiodens in a Pediatric Patient: A Case Report

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Abstract:- Supernumerary teeth are additional teeth or tooth-like structures that can develop either erupted or unerupted, beyond the normal complement of 20 primary teeth and 32 permanent teeth. A mesiodens is a specific type of supernumerary tooth located in the midline between the two central incisors. The presence of these extra teeth can lead to various clinical complications. This paper presents a case involving a palatally positioned, impacted mesiodens that was associated with an unerupted permanent left maxillary central incisor. Surgical removal of the mesiodens was performed, resulting in the successful eruption of the permanent incisor.

Keywords:- *Mesiodens, Surgical Extraction, Disimpaction.*

I. INTRODUCTION

Supernumerary teeth, defined as additional teeth exceeding the normal dental complement, are most commonly found in the central region of the maxilla or mandible, with mandibular occurrences being relatively rare. Among these, mesiodens are the most common type of supernumerary tooth, as noted by Alberti et al.[1] Mesiodens may appear as single, multiple, unilateral, or bilateral formations. When multiple supernumerary teeth are present in the midline, the condition is referred to as 'mesiodentes'.[2] Mesiodens can occur in isolation or as part of various syndromes, but they may also be observed in individuals without any associated syndromic conditions. A positive family history is considered a predisposing factor for this anomaly.

Understanding the prevalence of dental anomalies, such as mesiodens, is crucial for dentists, anthropologists, geneticists, and other health professionals. Epidemiological studies on this topic reveal considerable variability, with reported prevalence rates ranging from 0.15% to 1.9%. Additionally, mesiodens are more commonly found in males compared to females.

While mesiodens in primary dentition are relatively rare, they are frequently identified as the most common dental anomaly in permanent dentition.[3] Studies indicate that mesiodens are observed in approximately 82% of cases within the maxilla, predominantly in the premaxillary region.[4]

Mesiodens, which are often aesthetically unpleasing, can lead to a range of complications including malposition or delayed eruption of adjacent central incisors, midline diastema, caries, odontogenic cysts, as well as gingival and periodontal issues. They may cause impaction, resorption, and displacement of central incisors and may even extend into the nasal cavity. Therefore, early diagnosis and extraction of mesiodens are crucial to prevent these adverse effects.

II. CASE REPORT

An 8-year-old male presented to the Department of Pediatric and Preventive Dentistry with a primary concern of an unerupted upper left central incisor. A comprehensive examination revealed no significant findings in the medical or family histories, and extraoral examination showed no abnormalities. Intraoral examination indicated mixed dentition with Class I molar relationships bilaterally (figure 1).

Fig 1: Pre Operative Intraoral Images Showing Unerupted 11

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The patient was then referred for Cone Beam Computed Tomography (CBCT) of the maxilla to aid in the localization and orientation of the mesiodens. CBCT imaging was employed to provide a detailed assessment of the morphology and exact position of the mesiodens, along with the root development of the permanent maxillary central incisors. The images were interactively analyzed using specialized dental computed tomography software. (figure 2).

Fig 2: CBCT Showing the Presence of Impacted Mesiodens

The 3D CBCT panoramic view confirmed the impaction of the left permanent maxillary central incisor and detected the presence of a supernumerary tooth. Axial slice images revealed the mesiodens to be positioned palatally, while sagittal slices demonstrated that the supernumerary tooth was located palatally above the impacted permanent central incisor. A comprehensive treatment plan was formulated, involving the surgical extraction of both the mesiodens and the supernumerary tooth. Local anesthesia was administered, followed by the elevation of a mucoperiosteal flap using a full-thickness palatal approach. (figure 3).

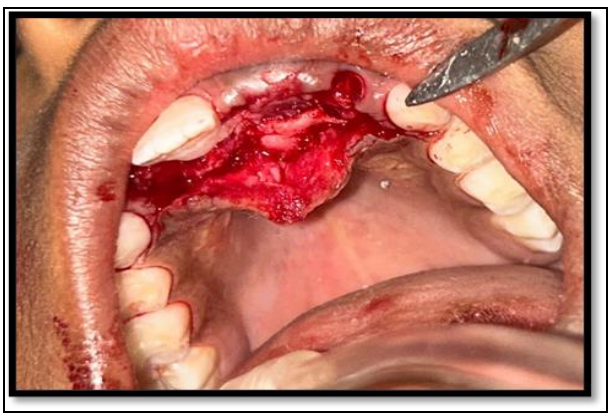

Fig 3: Elevation of Palatal Full-Thickness Flap

The supernumerary tooth was then exposed, luxated, and removed (figure 4).

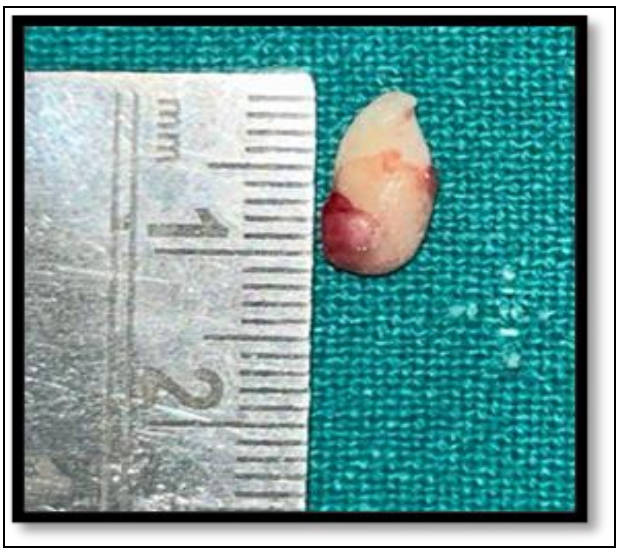

Fig 4: Extracted Mesiodens

Hemostasis was achieved, and the flap was repositioned and sutured (figure 5).

Fig 5: Repositioning of Flap and Suture Placement

For the mesiodens, a simple palatal anteroposterior incision was made, followed by extraction. A small horizontal incision was also performed on the incisal edges of the central incisor. Postoperative instructions were provided, along with a prescription for antibiotics and analgesics. Follow-up visits were scheduled for suture removal and to monitor the healing process. The patient was observed until the successful eruption of the permanent central incisors. At the 7-day postoperative recall, successful eruption of the central incisor was observed (figure 6).

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Fig 6: One Week Follow-Up Showing Eruption of 11

Complete eruption of the central incisor was confirmed at the three-months follow-up (figure 7).

Fig 7: Three Month Follow-Up

III. DISCUSSION

Supernumerary teeth, or hyperdontia, are defined as extra teeth that exceed the normal dental complement, regardless of their position or morphology [10]. These anomalies are most commonly found in the central regions of the upper or lower jaw, with mandibular occurrences being relatively uncommon.[5] Among supernumerary teeth, mesiodens is the most frequently encountered type, typically situated in the midline between the two maxillary central incisors. Its prevalence in the general population ranges from 0.15% to 1.9%, with a higher incidence reported in males than in females.[5] [6] Specifically, the prevalence of mesiodens has been documented at 0.45% in Caucasians, 0.4% in Finnish populations, 1.43% in Norwegians, and 2.2% in Hispanic populations. These variations in prevalence may be influenced by demographic and environmental factors. Supernumerary teeth are classified by morphology (e.g., conical, tuberculate, supplemental), location (e.g., mesiodens, paramolar, distomolar, parapremolar), position (e.g., buccal, palatal, transverse), and orientation (e.g., vertical, inverted, transverse, horizontal). In this case, the mesiodens was identified as conical and positioned palatally. Despite extensive knowledge of normal tooth development, the genetic causes and molecular mechanisms behind congenital anomalies in tooth number remain poorly understood.[7] Three major theories have been proposed to explain the development of mesiodens, though the topic remains a matter of ongoing debate.[8] The first theory, known as phylogenetic reversion or atavism, suggests that mesiodens may represent a relic from ancestors with three central incisors. The second theory, referred to as dichotomy, posits that the tooth bud splits to form two teeth, one of which becomes a mesiodens. The third and most widely supported theory involves hyperactivity of the dental lamina.[8] Although hereditary links to mesiodens have not been definitively proven, genetic factors are believed to contribute, as mesiodens have been observed in twins, siblings, and successive generations within families. Management of mesiodens varies depending on several factors, including the child's age, proximity of the mesiodens to adjacent incisors, and the developmental stage of the dental structures. In very young patients, the feasibility of performing a surgical procedure must be considered, with early intervention being advantageous to prevent potential psychological effects and long-term issues.[9] The proximity of the mesiodens to developing incisors is a crucial factor, as it can influence the position of the succedaneous tooth bud, obstruct eruption, or interfere with root development. Surgical extraction of the mesiodens carries the risk of trauma to the developing roots, potentially impacting future dental growth. In cases where surgery might endanger the developing tooth bud, delaying intervention may be advisable. Furthermore, the mesiodens' position within the jaw—whether labial or palatal—must be carefully assessed. In most cases, delayed permanent incisors will erupt spontaneously if sufficient space is created during the removal of the supernumerary tooth, making postoperative space maintenance essential. If space is inadequate, orthodontic intervention may be required. Spontaneous eruption of an impacted permanent maxillary central incisor after supernumerary tooth removal is reported in 54–75% of cases, typically occurring within 16–18 months post-removal. Smailiene et al. suggested that spontaneous eruption of impacted maxillary incisors is preferable to surgical orthodontic treatment. Recent studies show that conical mesiodens are more likely to facilitate the spontaneous eruption of the associated permanent incisor compared to tuberculate forms.[10] In this case, due to the incompletely formed root, a conservative approach was taken to encourage spontaneous eruption. Additionally, given the increased susceptibility of children to vagal stimulation, the risk of bradycardia should be considered during palatal flap procedures for mesiodens removal.

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IV. CONCLUSION

Supernumerary teeth, which exceed the normal dental complement in both primary and permanent dentition, are predominantly observed in males and are more common in permanent dentition. These anomalies can occur unilaterally or bilaterally, as single or multiple entities, and can affect any region of the dental arch. Mesiodens is a frequent type of supernumerary tooth and is associated with various complications, including crowding and cyst formation. CBCT provides precise three-dimensional information regarding the orientation, sagittal position, local disturbances, and neighboring anatomical structures of supernumerary teeth, which is crucial for pre-treatment evaluation. Therefore, routine use of CBCT is recommended for accurate diagnosis and management of supernumerary teeth.

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