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Pedodontics

CONE BEAM COMPUTED TOMOGRAPHY-GUIDED SURGICAL MANAGEMENT OF DOUBLE MESIODENS IN MIXED DENTITION: A CASE REPORT.

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ABSTRACT **Background:** Mesiodens is the most common supernumerary tooth occurring in the maxillary anterior region. Although a single mesiodens is relatively common, the occurrence of double mesiodens is uncommon and may lead to eruption disturbances, malocclusion, midline diastema, and aesthetic concerns. Accurate localization using cone beam computed tomography (CBCT) is invaluable for treatment planning and surgical management. **Case Presentation:** A 7-year-old boy presented with the chief complaint of an extra tooth in the upper anterior region that had been noticed by his mother two months earlier. Clinical examination revealed a palatally erupted supernumerary tooth associated with a midline diastema between the maxillary central incisors. Radiographic examination, including intraoral periapical radiography, panoramic radiography, and CBCT, confirmed the presence of two mesiodens: one erupted palatally and another impacted between the permanent maxillary central incisors. Surgical extraction of both supernumerary teeth was performed under local anesthesia through a palatal mucoperiosteal flap. Healing was uneventful, and the patient was scheduled for interceptive orthodontic treatment using a removable Hawley's appliance. **Conclusion:** Early diagnosis combined with three-dimensional imaging allows precise localization of mesiodens and facilitates safe surgical intervention. Timely removal of mesiodens during the mixed dentition period helps prevent eruption disturbances and reduces future orthodontic treatment complexity.

KEYWORDS : Mesiodens; Supernumerary tooth; Cone beam computed tomography; Mixed dentition; Surgical extraction; Pediatric dentistry

INTRODUCTION

Supernumerary teeth are developmental anomalies characterized by the presence of teeth in excess of the normal dental formula. They may occur anywhere within the dental arches and can affect both the primary and permanent dentitions. Their reported prevalence ranges from 0.1% to 3.8%, with a higher incidence in the permanent dentition and a male predominance.[1,3]

Among all supernumerary teeth, mesiodens is the most frequently encountered type and is located in the maxillary midline between the permanent central incisors. Mesiodens may present as a single or multiple tooth, erupted or impacted, and may exhibit conical, tuberculate, supplemental, or molariform morphology. Although the exact etiology remains uncertain, several theories have been proposed, including phylogenetic reversion (atavism), dichotomy of the tooth bud, and hyperactivity of the dental lamina. Among these, the hyperactivity theory is currently the most widely accepted explanation.[2,4]

Mesiodens may remain asymptomatic and be discovered incidentally during routine radiographic examination. However, many cases present with delayed eruption of permanent incisors, impaction, rotation or displacement of adjacent teeth, midline diastema, crowding, root resorption, cyst formation, and compromised facial aesthetics. Delayed diagnosis can increase treatment complexity and may necessitate extensive orthodontic intervention.[2,5,6]

Conventional radiographic techniques such as intraoral periapical, maxillary occlusal, and panoramic radiographs are commonly used for diagnosis. However, these two-dimensional images have limitations in accurately determining the buccolingual position and spatial relationship of impacted supernumerary teeth. Cone beam computed tomography (CBCT) has emerged as the imaging modality of choice because it provides three-dimensional visualization with relatively low radiation exposure compared with conventional computed tomography. CBCT enables accurate localization of mesiodens, assessment of its proximity to adjacent teeth and vital structures, and facilitates minimally invasive surgical planning.[7–9]

The timing of surgical removal of mesiodens remains controversial. Some authors advocate delayed intervention to minimize the risk of damage to developing permanent incisors, whereas most contemporary studies recommend early removal when the supernumerary tooth interferes with eruption, causes displacement of adjacent teeth, or results in functional or aesthetic problems. Early intervention during the mixed dentition stage has been shown to promote spontaneous eruption of impacted permanent incisors, improve alignment, and reduce the duration and complexity of subsequent orthodontic treatment.[6,10–12]

Double mesiodens are relatively uncommon and are reported far less frequently than solitary mesiodens. Their presence increases the likelihood of eruption disturbances and occlusal complications, making comprehensive clinical and radiographic evaluation essential. This case report describes the successful CBCT-guided surgical management of erupted and impacted double mesiodens in a 7-year-old child and highlights the importance of early diagnosis and multidisciplinary treatment planning in achieving favorable clinical outcomes.

CASE REPORT

Patient Information

A 7-year-old boy reported to the Department of Pediatric and Preventive Dentistry accompanied by his mother with the chief complaint of an extra tooth in the upper front tooth region, which had been noticed approximately two months earlier. The child was a resident of Muradnagar, Ghaziabad. This was not his first dental visit, and his behavior was assessed as **positive (Frankl Behavior Rating Scale: Positive)**. The patient's medical history was non-contributory, and there was no history of systemic illness, hospitalization, medication use, trauma, or hereditary disorders associated with supernumerary teeth. The dental history revealed previous restorative treatment, including placement of stainless steel crowns on the mandibular primary first molars (74 and 84) one year earlier.

Clinical Examination

Extraoral examination revealed no facial asymmetry, swelling, or features suggestive of any craniofacial syndrome. The patient exhibited a symmetrical facial profile with no palpable lymphadenopathy.

Intraoral examination showed the patient to be in the mixed dentition stage. A conical supernumerary tooth was present on the palatal aspect of the maxillary right permanent central incisor (11). A midline diastema was evident between the maxillary permanent central incisors.

Based on the clinical findings, a provisional diagnosis of a palatally placed supernumerary tooth associated with a midline diastema was established.

Figure 1. Preoperative intraoral photograph showing an erupted palatally positioned mesiodens associated with a midline diastema.

Radiographic Examination

Radiographic investigations included an intraoral periapical radiograph and cone beam computed tomography (CBCT). The intraoral periapical radiograph confirmed the presence of a supernumerary tooth in the anterior maxillary region.

CBCT examination provided three-dimensional localization of the supernumerary teeth. It demonstrated the presence of two mesiodens: one erupted conical supernumerary tooth positioned palatally to tooth 11 (S1) and a second impacted supernumerary tooth (S2) located between the permanent maxillary central incisors. The relationship of the impacted tooth to the adjacent permanent incisors was clearly visualized, facilitating precise surgical planning while minimizing the risk of injury to the developing permanent teeth.

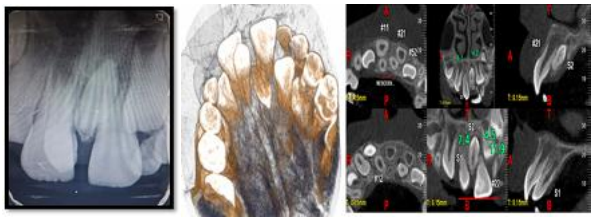

Figure 2. Intraoral periapical radiograph and Cone beam computed tomography showing the erupted mesiodens and an impacted mesiodens located between the permanent maxillary central incisors.

Final Diagnosis

Based on the clinical and radiographic findings, the final diagnosis was:

- Erupted palatally positioned mesiodens (S1) in relation to tooth 11
- Impacted mesiodens (S2) between teeth 11 and 21
- Midline diastema between the permanent maxillary central incisors
- Stainless steel crowns on teeth 74 and 84

Treatment Planning

Considering the patient's age, mixed dentition stage, presence of an erupted and an impacted mesiodens, and the associated midline diastema, surgical removal of both supernumerary teeth was planned. The objective was to eliminate the obstruction to normal eruption and alignment of the permanent incisors and reduce the likelihood of future orthodontic complications. Written informed consent was obtained from the patient's parent before the procedure.

Surgical Procedure

The surgical procedure was performed under local anesthesia using 2% lignocaine with 1:80,000 epinephrine. Following adequate anesthesia, strict aseptic protocol was maintained throughout the procedure.

A palatal crevicular incision extending across the anterior maxillary region was made, and a full-thickness mucoperiosteal flap was carefully reflected to expose the underlying palatal bone. The erupted mesiodens (S1) was first luxated and extracted atraumatically using appropriate extraction instruments.

Following removal of the erupted mesiodens, minimal bone removal was performed to expose the impacted mesiodens (S2). The impacted tooth was carefully elevated and removed while preserving the adjacent permanent central incisors and surrounding supporting bone. The surgical site was irrigated thoroughly with sterile saline to remove osseous debris.

The palatal flap was repositioned and secured using interrupted 3-0 black silk sutures. Hemostasis was achieved successfully, and postoperative instructions regarding oral hygiene, diet, and medication were provided to the patient's parent. Analgesics were prescribed as required, and the patient was advised to avoid trauma to the surgical site during healing.

Follow-up

The patient was reviewed five days after surgery. Clinical examination revealed satisfactory wound healing with minimal postoperative discomfort and no evidence of infection or bleeding. Sutures were removed uneventfully.

At the ten-day follow-up visit, the surgical site demonstrated complete soft tissue healing without complications. The patient remained asymptomatic, and satisfactory healing of the palatal tissues was observed. Future treatment planning included periodic clinical and radiographic follow-up to monitor eruption of the permanent incisors. Interceptive orthodontic treatment with a removable Hawley's appliance was planned to facilitate correction of the midline diastema after eruption of the permanent dentition. Preventive treatment in the form of pit and fissure sealants on the permanent first molars (16, 26, 36, and 46) was also advised.

Figure 3. Five days and Ten-days postoperative review after suture removal demonstrating uneventful soft tissue healing.

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