International Journal of Dental Research
www.dentaljournal.net
Online ISSN: 2664-9055, Print ISSN: 2664-9047
Received: 13-08-2024, Accepted: 12-09-2024, Published: 27-09-2024
Volume 6, Issue 3, 2024, Page No. 58-61

Management of impacted maxillary central incisors with supernumerary teeth -A case report

Dr. Shefali Gupta[1], Dr. Bhavesh Kothari[2], Dr. Sagar Shah[1], Dr. Aishwarya Reddy[1]
[1] Department of Orthodontics, Pacific Dental College and Hospital, Udaipur, Rajasthan, India
[2] Professor, Department of Orthodontics, Pacific Dental College and Hospital, Udaipur, Rajasthan, India, India

Abstract
Impaction of maxillary central incisors is infrequent, its prevalence rate is much lower than impaction of canine and there are several factors associated with impaction of maxillary central incisors such as odontoma, cyst, supernumerary teeth, space loss, displaced follicle etc. This case report describes the clinical management of a young female patient with bilaterally impacted supernumerary teeth (mesiodens) and maxillary central incisors. A multidisciplinary treatment approach was planned, which included surgical removal of the supernumerary teeth and orthodontic management of impacted maxillary central incisors. After 11 months of surgical exposure incisors were aligned in the arch.

Keywords: Supernumerary, orthodontic traction, impacted teeth

Introduction

Unerupted teeth are often encountered in the orthodontic practice. The nonappearance of maxillary central incisors even after eruption of adjacent maxillary lateral incisors is abnormal. Impaction of maxillary permanent incisors is not a frequent case in the dental practice, but its treatment is challenging because of these teeth's importance to facial aesthetics.[1] The prevalence of maxillary central incisor impaction ranges from 0.06% to 0.2%.[2] Central incisor impaction may result from a number of local and systemic factors. Over-retained deciduous teeth, supernumerary teeth, or ectopic eruption and crowding are the most common etiological factors for impacted central incisors. Supernumerary teeth are the most common developmental dental anomaly resulting from hyperactivity of dental lamina, dichotomy, environmental factor, or polygenetic process of atavism. Supernumerary teeth present classical oral complication such as impaction of adjacent teeth, crowding, diastema formation, rotation, displacement of teeth, and occlusal interference. The most common supernumerary tooth is a mesiodens, which occurs between the maxillary central incisors. Mesiodens can occur individually or as multiples, and may appear unilaterally or bilaterally.[3] Careful planning and interdisciplinary approach are required in the management of impacted central incisor. Treatment alternatives for an impacted central incisor include extraction and restoration with a bridge or an implant later when growth has ceased; extraction and closure of the space by substituting the lateral incisor for the central incisor with subsequent prosthetic restoration; and surgical exposure, orthodontic space opening, and traction of the impacted central incisor into its proper position. Orthodontic traction is preferred over restorative or prosthetic rehabilitation in case of favourable conditions as the patients are usually young, the prosthetic treatment can only be done after growth completion therefore space maintainer needs to be given to the patient and regular follow up to be done whereas with the orthodontic treatment, we can save the natural tooth of the patient and align it into the arch.[4]

Diagnosis and etiology

A 11-year-old female patient reported to the department with the chief complain of irregularly placed teeth in upper front region of the jaw. Patient has a history of extraction of deciduous central incisor. No history of trauma associated.
On extraoral examination patient showed bilaterally symmetrical face with straight profile and competent lips.
On intraoral examination patient revealed class I molar and canine relation bilaterally, missing 11, 21, mild crowding in lower anterior region.

Fig 1: Pre-treatment extraoral

Fig 2: Pre-treatment intraoral

OPG examination revealed presence of supernumerary teeth and impacted 11, 21, mesially tilted 15.
CBCT examination revealed presence of over-retained roots of deciduous central incisors with supernumerary teeth along with impacted central incisors which was placed labially to supernumerary teeth.

On lateral ceph examination there was skeletal class I relation with normal maxilla and mandible, normodivergent jaw bases and normal lips. (table 1)
On model analysis 10mm of space was available in the upper arch in arch perimeter analysis.

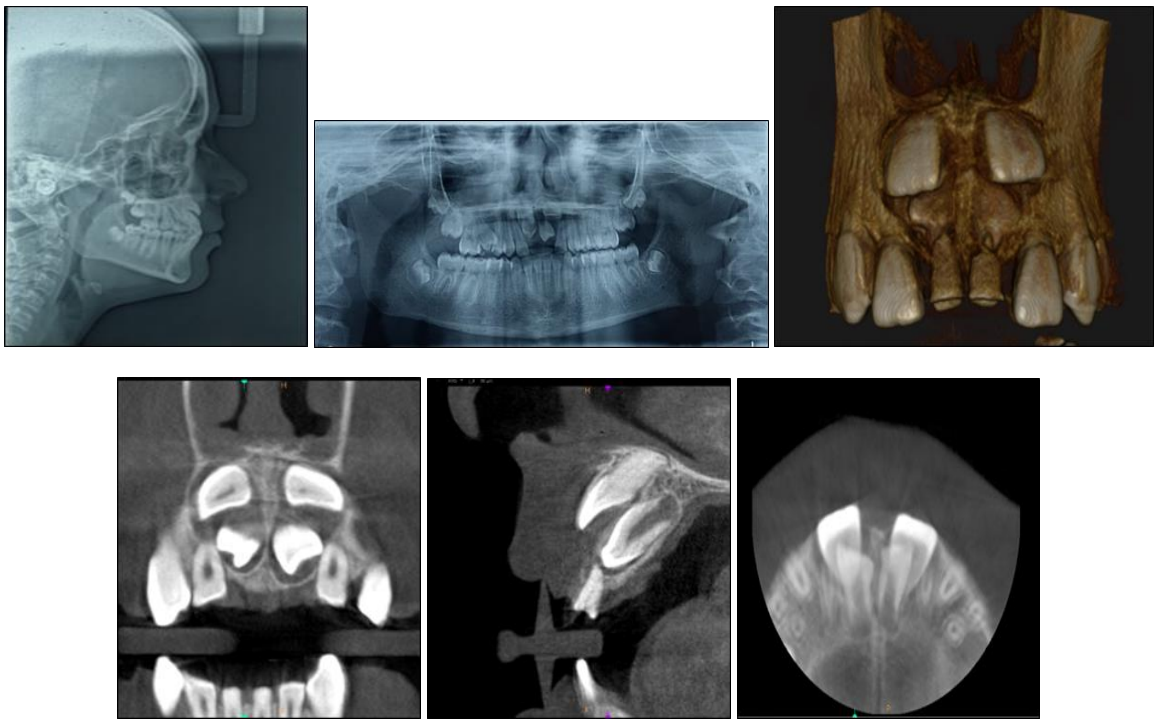

Fig 3: Pre-treatment radiographs

Table 1: Pre-treatment lat ceph values

Parameter	Patient Value	Normal Value
SNA	81 DEG	82±2 DEG
SNB	79 DEG	80±2 DEG
ANB	2 DEG	2 DEG
AO-BO	1 MM	0±2 MM
SADDLE ANGLE	123 DEG	123±5 DEG
SN-GO-GN	30 DEG	32 DEG
FMA	24 DEG	25 DEG
JARABAK RATIO	65.8%	62-65%
U1-SN	110 DEG	102 DEG
U1-NA	24 DEG, 4 MM	22 DEG, 4 MM
L1-NB	27 DEG, 4 MM	25 DEG, 4 MM

Treatment objectives

1. To align 11 and 21 into the arch
2. To relieve crowding in lower arch
3. To maintain class I molar and canine relation bilaterally
4. To achieve ideal overjet and overbite
5. To maintain balanced soft tissue profile

Treatment plan

Treatment plan decided was to extract the over retained deciduous central incisor roots followed by initial alignment of the upper arch then surgical exposure of the anteriors where extraction of supernumerary teeth (mesiodens) and permanent central incisor exposure to be carried out simultaneously and to give traction to 11, 12. This was decided because of the favorable buccal positioning and vertical impaction of the incisors and sufficient space was available in the arch to align the teeth.

Treatment progress

Treatment started with bonding of 0.022"x0.028" pre-adjusted edgewise bracket in the maxillary arch. Initial leveling and alignment started with 0.012" NiTi wire followed by 0.014", 0.016", 0.018" NiTi wires after which surgical exposure was carried out at 0.018" SS wire.

Surgical exposure- patient was referred to department of Oral Surgery for surgical exposure where Closed surgical exposure technique was used in which a full mucoperiosteal flap was raised. On raising the flap mesiodens were extracted first then Begg's bracket was bonded to the permanent central incisors and a monkey loop was attached to it then the flap was sutured back.

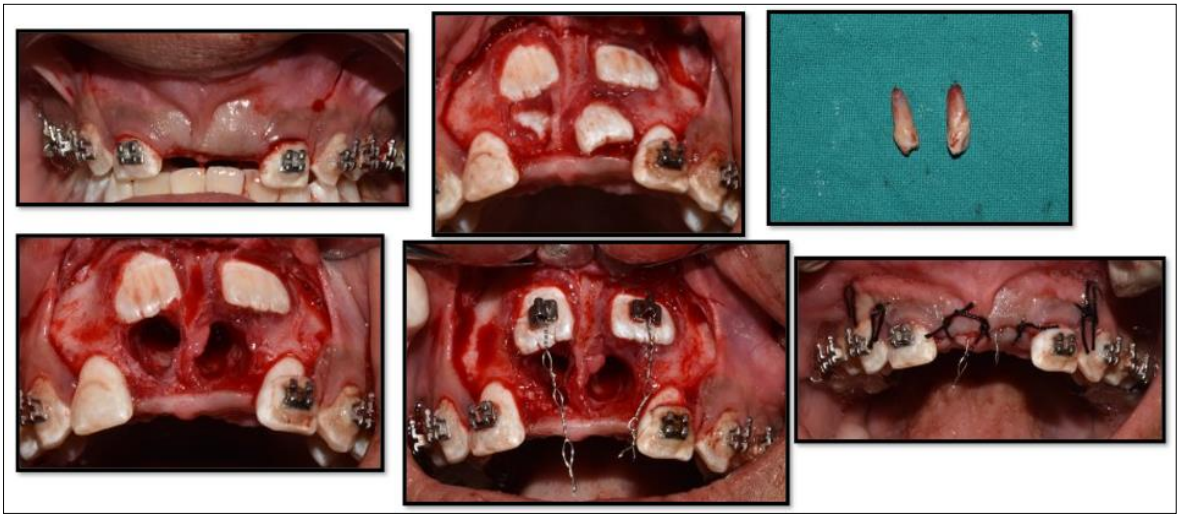

Fig 4: Extraction of mesiodens and surgical exposure of incisors

Orthodontic treatment was continued post exposure and traction was given to central incisor after some time 0.018" Aust SS with step down was formed to continue the traction on central incisors after the incisors were well within the arch the pre-adjusted brackets were bonded on 11, 12 and 0.014" NiTi continuous wire was placed and the treatment is in progress with 0.018" NiTi wire. It took 11 months to bring the impacted incisors into the arch after surgical exposure.

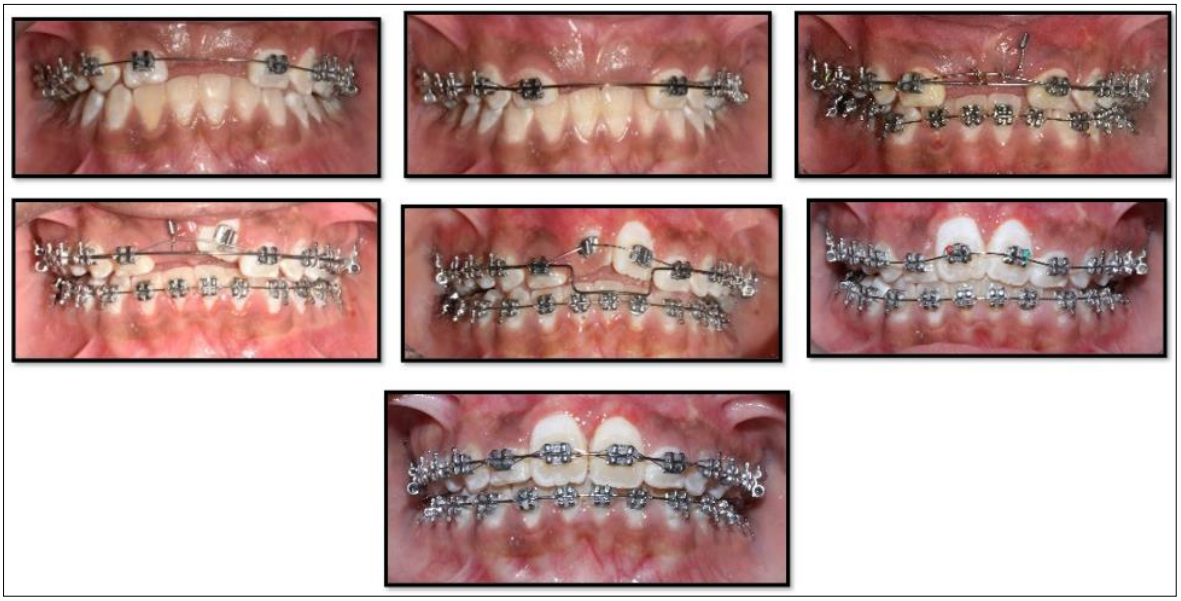

Fig 5: Treatment progress photographs

A, B- Initial leveling and alignment, **C, D-** Orthodontic traction to 11, 21 and 21 was exposed into the oral cavity, **E-** step down bend in 0.018" ss to tract 11, **F, G-** post traction alignment and leveling

Discussion

Impacted teeth can cause serious dental and aesthetic difficulties as well as psychological problems especially in anterior regions. Although the impacted maxillary incisor occurs less frequently than the maxillary canine, it is of concern to parents because of uneruption of the teeth.[5] Maxillary central incisor impactions occur infrequently; their origins include various local causes, such as odontoma, supernumerary teeth, space loss, and disturbances in the eruption path, also trauma and apical follicular cysts.[6] In our case both of the upper permanent incisors were disrupted by two supernumerary teeth (mesiodens).

Supernumerary teeth are the most common disorder of odontogenesis. They may occur alone or in multiple, unilateral or bilateral, erupted or impacted, and appear in the maxilla, mandible, or both. supernumerary teeth are most common in the anterior maxilla (mesiodens) followed by the maxillary molar region. Multiple supernumerary teeth occur most frequently in the mandibular premolar region.[7] Four major types of supernumerary teeth are recognized based on their morphology and location: conical, tuberculate, supplemental, or odontoma. Although the etiology of supernumerary teeth is unknown, the tendencies are familial. Other possible hypotheses are hyperactivity of dental lamina, dichotomy, spontaneous gene mutation, or environmental factors.[8]

Impaction of maxillary anterior teeth can be a challenging orthodontic problem. Several reports have indicated an impacted tooth can be brought into proper alignment in the dental arch. The following factors are used to determine whether successful alignment of an impacted tooth can take place: (1) the position and direction of the impacted tooth, (2) the degree of root completion, (3) the degree of dilacerations, and (4) the presence of space for the impacted tooth.[9] Holland has recommended the movement axis of the impacted tooth must be considered together with these factors. The treatment approach for impacted maxillary teeth requires joint effort from both the Orthodontist as well as oral surgeon.[10]

Several techniques are commonly used to uncover maxillary labial impactions. One technique, the apically positioned flap, consists of apically repositioning a raised flap that incorporates attached gingiva overlying the impacted tooth. Another technique, the closed-eruption technique, involves raising a flap that incorporates attached gingiva over the impacted tooth, attaching an orthodontic bracket to the tooth, and then fully replacing the tissue over the tooth and bracket. Each technique offers certain advantages during forced eruption of impacted teeth. The apically positioned flap technique permits ready reattachment of a bracket if unintended debonding occurs. However, the closed-eruption technique is believed to provide the most aesthetically pleasing result. In the present case, the closed eruption surgical technique was used. This technique is more reliable when aesthetic and periodontal health is considered.[11] Vermette et al. recommended the usage of the closed eruption technique when the tooth is in the middle of the alveolus or high near the nasal spine.[12] In a case report by Bayram et al they also used closed surgical technique, as this was more reliable when esthetics and periodontal health was considered.[13] But in a case report by Pinho, Neves and Alves they used open surgical technique because of the horizontal impaction of the maxillary central incisor, direct removal of the oral mucosa was the only way to expose the tooth and attach the wire.[14] Use of surgical techniques is case dependent but closed is more preferred over open because more of its esthetic concerns post exposure.

Conclusion

Impacted permanent incisors due to supernumerary tooth and associated pathology are a rare entity and often encountered with psychological problems in children. In the present case reports, cumulative surgical and orthodontic treatment resulted in esthetically pleasant and balanced occlusion. Thus, timely recognition of these entities and early multidisciplinary treatment are required for greater hard and soft tissue preservation.

References

1. Becker A. Early treatment for impacted maxillary incisors. Am J Orthod Dentofacial Orthop,2002:121:586-7.
2. Grover PS, Lorton L. The incidence of unerupted permanent teeth and related clinical cases. Oral Surg Oral Med Oral Pathol,1985:59:420-5.
3. Hyun HK, Lee SJ, Lee SH, Hahn SH, Kim JW. Clinical characteristics and complications associated with mesiodentes. J Oral Maxillofac Surg,2009:67:2639-43.
4. Khera AK, Rohilla A, Tandon P, Singh GP. Orthodontic management of impacted central incisor: A clinical challenge. J Indian Orthod Soc,2017:51:46-50.
5. Bishara SE. Impacted maxillary canines: a review. Am J Orthod Dentofacial Orthop,1992:101:159.
6. Brin I, Zilberman Y, Azaz B. The unerupted maxillary central incisor: review of its etiology and treatment. ASDC J Dent Child,1982:49:352.
7. Giancotti A, Grazzini F, De Dominicis F, Romanini G, Arcuri C. Multidisciplinary evaluation and clinical management of mesiodens. J Clin Pediatr Dent,2002:26:233-7.
8. Marya CM, Kumar BR. Familial occurrence of mesiodentes with unusual findings: Case reports. Quintessence Int,1998:29:49-51.
9. Uematsu S, Uematsu T, Furusawa K, Deguchi T, Kurihara S. Orthodontic treatment of an impacted dilacerated maxillary central incisor combined with surgical exposure and apicoectomy. Angle Orthod,2004:74:132.
10. Holland DJ. The surgical positioning of unerupted, impacted teeth. Oral Surg Oral Med Oral Pathol,1956:9:130.
11. Becker A, Brin I, Ben-Bassat Y, Zilberman Y, Chaushu S. Closed-eruption surgical technique for impacted maxillary incisors: a postorthodontic periodontal evaluation. Am J Orthod Dentofacial Orthop,2002:122:9.
12. Vermette M, Kokich V, Kennedy D. Uncovering maxillary labial impactions: Apically positioned flap versus closed eruption. Angle Orthod,1995:65:23.
13. Bayram M, Özer M, Şener I. Bilaterally impacted maxillary central incisors: surgical exposure and orthodontic treatment: a case report. J Contemp Dent Pract,2006 :7(4):98-105.
14. Pinho T, Neves M, Alves C. Impacted maxillary central incisor: surgical exposure and orthodontic treatment. Am J Orthod Dentofacial Orthop,2011:140:256-65