



Case Series

Orthodontic management of midline diastema caused by mesiodens: A case series

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ABSTRACT

Supernumerary teeth are teeth in excess of the normal number, found in both primary and permanent dentition. Mesiodens are the most common form of supernumerary teeth, usually found in the maxillary anterior region, in between the permanent central incisors. It may lead to complications such as malocclusion, unesthetic appearance, food lodgment, and cyst formation. Early diagnosis and immediate intervention are advised to avoid orthodontic and pathological complications. The case series here discusses three different cases for presence of supernumerary teeth leading to development of midline diastema. Extraction of the supernumerary teeth followed by fixed orthodontic treatment was performed to correct the malocclusion and improve the facial esthetics.

Keywords: Mesiodens, Midline diastema, Interceptive orthodontics, Esthetics

INTRODUCTION

Most of the time supernumerary teeth are usually asymptomatic clinically. However, the presence of mesiodens can lead to malocclusion, unesthetic appearance of the patient, midline diastema, crowding, delayed and/or ectopic eruption of the incisors, shift, and rotation of neighboring teeth, eruption into the nasal floor cavity, loss of tooth vitality due to root resorption, and less commonly development of primordial or follicular cysts with significant loss of bone.^[1]

Supernumerary teeth are teeth in excess than the normal number, found in both deciduous and permanent dentition. It can be single or multiple, malformed or normal appearing, unilateral or bilateral, and impacted or fully erupted.^[2] According to reports, the incidence ranges from 0.3% to 0.8% in the primary dentition and from 1.5% to 3.5% in the permanent dentition.^[2] More than 90% supernumerary teeth are found in the maxilla, with the premaxilla showing a robust preference.^[3] The most commonly occurring supernumerary tooth is Mesiodens, usually located in the midline of the premaxillary region in between central incisors, also known as “middle tooth.” Mesiodens are usually found to be impacted, but they can also be fully or ectopically erupted.^[4]

Early recognition, diagnosis, and intervention are strongly recommended so that the patient may receive proper guidance by means of extraction of the supernumerary tooth and subsequently followed by interceptive orthodontic treatment that will lead the patient to a favorable esthetic and functional occlusion, by the time they reach adulthood. This esthetic correction is essential

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for especially female patients, in order to boost their confidence regarding their appearance and personality.

This case series documents three cases of non-syndromic supernumerary teeth present in the midline of the premaxillary region. This led to the development of midline diastema that was corrected by extraction of the supernumerary teeth followed by fixed orthodontic treatment.

CASE 1

A 14-year-old female patient reported to the Department of Pediatric Dentistry with the main complaint of some extra teeth in the front region of the upper jaw. Medical and dental histories were non-contributory. Clinical examination revealed the presence of three mesiodens in the maxillary anterior region, out of which two were present buccally and one was present palatally, which caused spacing between tooth 11 and 21 [Figure 1a]. Distopalatal rotation of maxillary right central incisor up to 45° is shown in [Figure 1a], along with scissors bite with respect to tooth 14 and 44 [Figure 1b].

Treatment plan involved the removal of the three mesiodens followed by fixed orthodontic treatment. Initially, the orthodontic treatment started with bonding of brackets from 16 to 26, leaving the tooth 11 engaged, and placing an E-chain between 11 and 21 [Figure 1c and 1d]. On consecutive follow-ups every month, tooth 11 was engaged into the wire, brackets were bonded on the mandibular arch, and the wire size was changed up to the size 0.018 for both the arches. Scissor bite was corrected using BluBite light cure resin on tooth 36 and 46. All the treatment procedures were completed in five months with remarkable results [Figure 1e].

CASE 2

An 8-year-old female patient with her parents attended the Department of Pediatric Dentistry with the concern of malaligned teeth in the front region of upper jaw. No relevant medical and dental history was associated. Intraoral examination revealed the presence of mesiodens in the maxillary anterior region that caused mesiopalatal rotation of about >90° of tooth 11, which resulted in midline diastema. Radiographic examination confirmed the presence of mesiodens between tooth 11 and 12 [Figure 2a].

After taking informed consent from the parents, mesiodens was extracted under local anesthesia [Figure 2b]. Initiating the fixed orthodontic treatment, brackets were bonded from tooth 53–63, and the lingual button was bonded on the distal surface of tooth 11 for the derotation [Figure 2c]. To apply dual force, an Elastomeric chain (E-chain) was attached from the lingual button on tooth 11 to bracket on tooth 53, and other E-chain was attached between brackets on the labial surface of tooth 11–21 [Figure 2c]. On subsequent follow-ups, the E-chain was changed for two months, brackets were bonded on the remaining teeth in the maxillary arch with the placement of Nickel Titanium (NiTi) wire, and the wire size was changed every month. Treatment goals were achieved in six months with no complications [Figure 2d].

CASE 3

A 13-year-old female patient showed up to the Department of Pediatric Dentistry with the problem of unesthetic appearance of upper front teeth. Medical and dental histories were non-significant. Clinical examination revealed the presence of

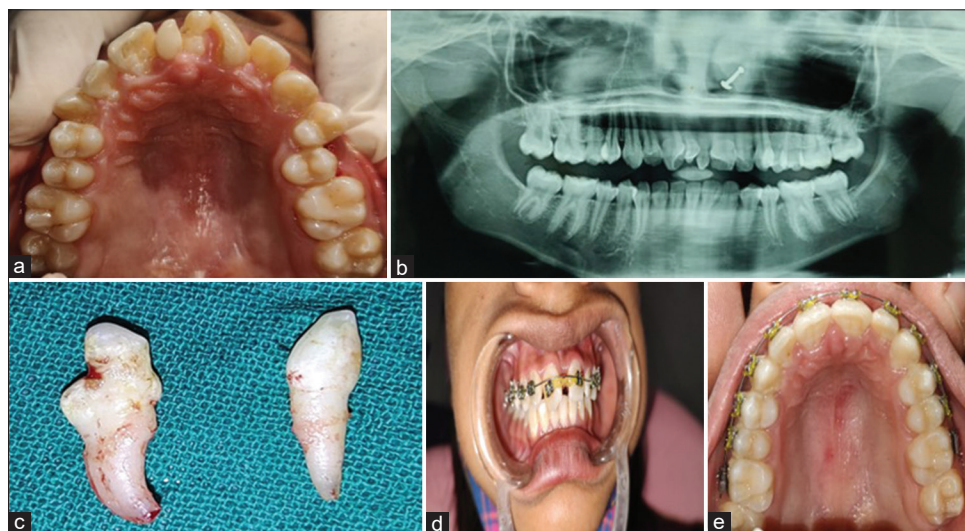


Figure 1: (a) Intraoral examination showing two fully erupted mesiodens. (b) OPG showing the presence of two mesiodens. (c) Extraction of mesiodens. (d) Fixed orthodontic treatment with placement of E-Chain for correction of midline diastema. (e) Follow-up after five months. OPG: Orthopantomogram; E-chain: Elastomeric chain

one fully erupted mesiodens and one supernumerary tooth mimicking the shape of a lateral incisor in the maxillary anterior region. Mesio palatal rotation of tooth 12 and rotation of approximately 90° with respect to tooth 22 was seen. Midline diastema and loss of space of 2.5 mm with respect to tooth 22 were also shown [Figure 3a].

Extraction of the mesiodens was performed under local anesthesia, after obtaining consent from the parents. Fixed orthodontic treatment was started by placing brackets from tooth 16 to 26, and 0.012 NiTi wire was placed in the maxillary arch, leaving tooth 12 unengaged to the wire. An open coil spring was placed from tooth 11 to 13, to regain approximately 2.5 mm space to bring tooth 12 into its normal position and occlusion [Figure 3b and c]. A lingual button was placed on the palatal surface of tooth 12, following



Figure 2: (a) OPG showing presence of mesiodens. (b) Extraction of mesiodens. (c) Fixed orthodontic treatment with placement of lingual button and E-chain. (d) Follow-up showing well-aligned incisors. OPG: Orthopantomogram; E-chain: Elastomeric chain

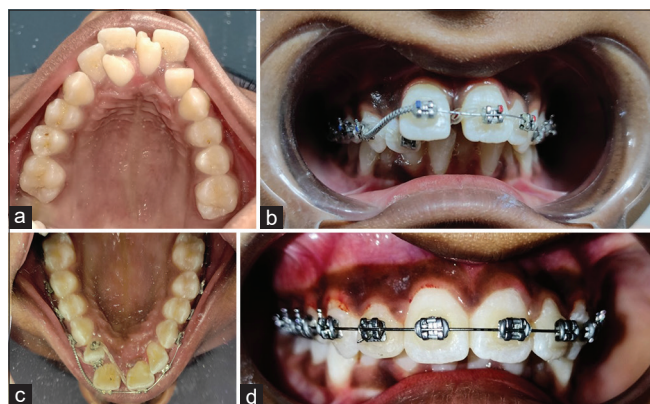


Figure 3: (a) Intraoral examination showing presence of one mesiodens and one supplemental lateral incisor. (b) Fixed orthodontic treatment post-extraction of mesiodens and supplemental lateral incisor. (c) Placement of lingual button on tooth 12. (d) Follow-up after five months showing closure of midline diastema.

which the E-chain was engaged from the lingual button to the bracket placed on the buccal surface of tooth 21, for the derotation [Figure 3c and d]. On a later visit, the open coil spring was removed, and NiTi wire was engaged to tooth 12. Treatment was completed in five months, and the esthetics of the patient was restored with exceptional results [Figure 3d].

DISCUSSION

The presence of supernumerary permanent teeth with the development of midline diastema is most commonly reported in the premaxillary region and occasionally reported in mandibular central incisors and molar region. Apart from mesiodens, there are various other supernumerary teeth found, namely, parapremolar, paramolar and distomolar.^[5,6] One-third of all patients with a mesiodens also have other supernumerary teeth; however, some patients present with mesiodens in conjunction with congenitally missing teeth.^[7] The causes behind supernumerary teeth consist of theories such as “Phylogenetic process of atavism,” the “dichotomies of the tooth bud,” “hyperactivity of dental lamina,” hereditary, and genetic and/or environmental factors.^[8] Supernumerary teeth are also associated with various developmental disorders such as cleidocranial dysostosis, cleft lip and palate, Gardner’s syndrome, Ehlers-Danlos syndrome, Ellis-van Creveld syndrome, Trichorhinophalangeal syndrome, and incontinentia pigmenti.^[5]

In the present case series, Case 1 shows presence of three mesiodens, of which two were fused together, and another one was present separately. This could be attributed as a case double mesiodens, which are said to be a rare situation and has been recorded in 12.23% of cases according to Orhan *et al.*^[9] and Hernandez *et al.*^[10] 23.1% according to Gunduz *et al.*^[11] 13.2% to Salcido-García *et al.*^[12] and 5.1% to Ferrés-Pradó^[13] Sujlana *et al.*^[14] reported a case series of double mesiodens, in which extraction of the mesiodens was performed, and on periodic follow-ups, spontaneous eruption of permanent teeth was observed. Phase *et al.*^[15] reported a case of double mesiodens that were treated by extraction of mesiodens followed by fixed orthodontic mechanotherapy.

Case 2 shows presence of a mesiodens which led to the mesio palatal rotation of adjacent tooth 11 and midline diastema as well. Kumar *et al.*^[2] reported a case of mixed dentition with rotation and impaction of upper incisors due to the presence of mesiodens. Surgical intervention and fixed orthodontic helped in the correction of the malocclusion. Mandhotra *et al.*^[16] also reported a similar case in which extraction was done followed by orthodontic intervention with a removable Hawley’s appliance first and a fixed 2 × 4 appliance later on.

Case 3 shows the presence of one mesiodens and one supplemental lateral incisor. Such cases of supplemental lateral

incisors are very rare, and only a few cases have been reported in the literature till date. Patil reported a case of supplemental lateral incisor, in which extraction was performed followed by alignment of the incisors by means of orthodontic treatment.^[17]

Early surgical intervention by removal of the extra tooth/teeth should be done immediately after the diagnosis in order to promote self-eruption in the early mixed dentition period, when the normal eruptive forces are in action that eventually reduces the need for alignment and orthodontic correction. Delay in extraction of mesiodens might eventually lead to malalignment of the erupted permanent teeth along with loss of space and midline diastema. Hence, prompt orthodontic treatment is necessary in order to restore proper esthetics and function of the patient.^[18]

CONCLUSION

The occurrence of supernumerary teeth is quite common and might also be associated with certain complications. Regardless of the etiology involved, the clinician should have sufficient knowledge in order to identify the signs that indicate the presence of supernumerary teeth. Hence, early diagnosis and immediate orthodontic intervention is recommended in such cases.

Ethical approval

The Institutional Review Board approval is not required.

Declaration of patient consent

The authors certify that they have obtained all appropriate patient consent.

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Conflicts of interest

Dr Suleman Khan is on the editorial board of the journal.

Use of artificial intelligence (AI)-assisted technology for manuscript preparation

The authors confirm that there was no use of artificial intelligence (AI)-assisted technology for assisting in the

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