

# Midline space closure in the mixed dentition: A case report

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## ABSTRACT

The present case report describes a mesiodens in a 9-year-old boy. The purpose of this case report is to emphasize the importance of space closure in the mixed dentition facilitating the eruption of a permanent tooth. The clinical, radiographic and therapeutic considerations are presented. The outcome of the present case report is to alert the clinician that an early extraction of the mesiodens can be useful as it allows greater space conservation which can be utilized for the permanent tooth to erupt.

**KEYWORDS:** Mesiodens, Midline diastema, Frenectomy, Extraction

## INTRODUCTION

Teeth which are in excess from the normal number are known as supernumerary teeth.<sup>1</sup> The supernumerary teeth when located in the maxillary central incisor region are called as mesiodens. Their prevalence has been estimated to be 0.15 to 2.2% of the population with a preference of male.<sup>2</sup> It can be single or multiple in an arch. The presence of a mesiodens is usually found to be impacted, with a conical crown and a single root.<sup>3</sup> The diagnosis of the mesiodens is made by clinical and radiographic examinations. During dental development, the presence of a midline diastema and a supernumerary tooth in the maxillary arch could be devastating from the esthetic view.<sup>4</sup> In those situations; the main causes of midline diastema are not only mesiodens but also peg-shaped lateral incisors, labial frenum etc.<sup>5</sup> In many instances, mesiodens is associated with disturbances in tooth eruption. The literature brings different approaches to solve the pathologic conditions like mesiodens and midline diastema. The ultimate option is surgical intervention of mesiodens followed by orthodontic space closure of the diastema.<sup>6</sup>

## CASE REPORT

A 9-year-old boy reported to the Department of pediatric and preventive dentistry, Sri Aurobindo College of dentistry and PG institute, Indore, Madhya Pradesh, India; with the chief complaint of irregularly arranged teeth in the upper front teeth region of the jaw, causing unaesthetic appearance. There was no relevant medical history and the patient was otherwise healthy. On clinical examination, the patient was found to be in a mixed dentition and in addition, there was a mesiodens present in between 11 and 21 resulting in a midline diastema of the maxillary centrals (Figure 1a and b).



Fig 1a, b. Intra oral photographs of the mesiodens in relation with central incisors.

No interference with the occlusion was detected and the soft-tissue appeared normal. Distoproximal caries was noted with upper left first primary molar and so as to investigate further, routine radiographic examinations were carried out. The radiographs revealed impacted lateral incisors both right, left and Distoproximal decay with 64 (Fig 2a, b and c).

A multidisciplinary approach is desirable to manage this clinical condition. The mesiodens was extracted under local anesthesia (Fig 3) along with the extraction of 64 followed by orthodontic space closure by a removable

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appliance (Fig 4).



Fig 2a, b and c. showing blocked lateral incisors and Distoproximal decay with 64.



Fig 3 and 4 showing Extracted specimen, removable appliance with 11 and 21.

The patient was kept under observation and recalled after 3 weeks. Following 3 weeks the labial frenum's inflammatory enlargement was recorded (Fig 5); hence a frenectomy procedure was performed (Fig 6); followed by continuation of the removable orthodontic appliance (Fig 7).



Fig 5. Intraoral photograph showing enlarged labial frenum

The patient was recalled after 3 to 4 weeks and a space closure was achieved (Fig 8). After 4 months follow up, lateral incisors eruption was observed. (Fig 9).



Fig 6. Intraoral photograph after frenectomy



Fig 7. Intraoral photograph after frenectomy and appliance continuation



Fig 8. Intraoral photograph showing space closure



Fig 9. Intraoral photograph showing space closure and lateral incisors eruption.

## DISCUSSION

Mesiodens are usually discovered during the mixed dentition phase. Mesiodens once located may be responsible for a number of pathological conditions causing an eruption delay in the permanent teeth. Although the radiographic examination helps to identify the pathological conditions (anodontia, supernumerary teeth, malpositions of maxillary incisors etc).<sup>7</sup> Mesiodens may be single or multiple and often remain unerupted<sup>8</sup>. Gunduz et al<sup>9</sup> documented the occurrence of one

supernumerary tooth in 76.8% cases and two mesiodens bilaterally on either side of midline in 23.1% cases and they further informed that only 21% of mesiodens erupt into the oral cavity. During dental development malocclusion can occur due to the interplay of different factors. The case report described here involved an interaction of two major factors, a mesiodens and a high frenum attachment (which was later encountered although) leading to a 5-6mm midline diastema. The early diagnosis of large midline diastemas and erupted mesiodens is more common because they are located in the maxillary anterior region which makes them easily noticeable. However, this case report does not favour the idea of early detection of the mesiodens; since it was present from last 2 years according to the theoretical age of maxillary central incisor eruption. Along with this problem maxillary lateral incisors did not erupt in the dental arch at an expected age which is 8 years, it can be characterized as an eruption delay. The reason of this clinical condition was the presence of the mesiodens and diastema, hereby blocking the space for the lateral eruption; so an extraction followed by space closure was planned providing an opportunity for the laterals to erupt spontaneously.

The literature describes various treatment approaches to close the midline diastema such as composite veneers, fixed or removable orthodontic appliances, prosthetic replacements (in cases of congenitally missing permanent tooth). In the present case report a removable orthodontic appliance was used as a treatment option; which is an easy and effective method. Although a patient's co operation is required in this method to gain successful results.

The literature supports the cause/effect relation between the mesiodens and the midline diastema. Often the clinical intervention is required for supernumerary teeth because it may affect the eruption and anatomic positioning of the adjacent teeth.<sup>10</sup> The present case report shows this association, which was aggravated by the high frenum attachment which was later encountered during the treatment procedure. Thus, a space closure was required to correct the midline diastema due to mesiodens and high frenum attachment. For the first problem the clinical option, was the surgical removal of the mesiodens followed by the orthodontic closure of the remaining space. Interestingly, after the mesiodens removal, there was a 1 to 1.5 mm reduction in the diastema<sup>11</sup>. Although a spontaneous closure of the midline diastema is the physiological tendency after the eruption of the maxillary canines<sup>12</sup>, but in the present case report an orthodontic approach was undertaken to allow the eruption of maxillary lateral incisors. Thus, removable orthodontic appliance was used, which is a simple and interceptive approach. However the treatment plan was modified due

to an inflammatory hyperplasia causing a high frenum attachment. So a frenectomy was performed followed by appliance activation. With the early clinical intervention, lateral incisor eruption was attained but further orthodontic intervention is needed for establishing the harmonious occlusion.

## CONCLUSION

The present case report showed the presence of a mesiodens in the maxillary arch, causing midline diastema and aesthetic problem in the patient. Mesiodens is a fairly common but it may hamper the eruption of the permanent teeth. Early diagnosis followed by the management of a mesiodens reduces the future complications and may provide a spontaneous eruption opportunity to the permanent teeth.

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