



MIDLINE DIASTEMA CORRECTION -AN ESTHETIC NEED – A CASE REPORT

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ABSTRACT

The presence of midline diastema between maxillary central incisors in adults is considered unacceptable and needs to be treated differently in terms of modality or timing. Correct diagnosis and relevant intervention is a must for its treatment. Timing also plays a vital role in getting a satisfactory result. Presented herewith is a case report of a 21 year old girl with midline diastema which was closed with fixed orthodontic treatment. This treatment approach improved the esthetics of the patient.

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INTRODUCTION

The continuing presence of a diastema between the maxillary central incisors in adults is an esthetic or malocclusion problem. Angle described Midline diastema as a common form of malocclusion distinguished by a space between the upper central incisors and occasionally between lower central incisors¹. Keene described maxillary midline diastema as anterior midline spacing greater than 0.5 mm between adjacent teeth². The space can be a normal growth characteristic during the primary and mixed dentition and is generally closed by the time the maxillary central incisors erupt. But for some individuals the diastema does not close spontaneously³.

Keene found the incidence of maxillary midline diastema to be 14.8% and mandibular midline diastema to be 1.6%¹. The epidemiological investigation by Taylor, Gardiner and Weyman shows the prevalence of midline diastemas to be high in children, decreasing dramatically between 9 and 11 years of age and continues a gradual decrease upto 15 years of age^{4,5,6}. No definite aetiology for midline diastema has been identified. Multiple factors may contribute to it. In 1907 Angle suggested frenum as a cause¹ but was contraindicated by Coremello and Tart^{7,8}. Other causes suggested include missing or undersized lateral incisors; parafunctional habits; mesiodens, ankylosed central incisor, anodontia, macroglossia, dentoalveolar disproportion, disproportionate spacing, ethnic and familial characteristic, midline pathology etc.^{9,10,11,12,13,14}

The maxillary midline diastema has been of great interest to the clinician. After complete eruption of permanent dentition,

the continued presence of midline diastema is unaesthetic and the patient desires to close the diastema¹⁵. The case presented here describes a young female with the chief complaint of unsightly space present between her upper front teeth. This case demonstrates how the diastema was corrected orthodontically bringing a pleasant smile on her face.

Case report

The patient was 21 year old girl who had come to get the space between her upper front teeth closed, as the space made her feel embarrass. The face was symmetric with competent lips and a harmonious profile (Fig 1).

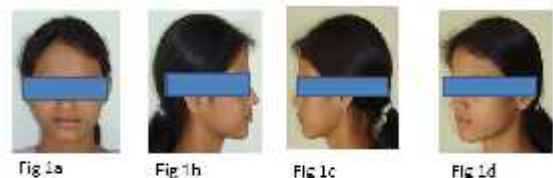


Fig 1a-d: Pre-treatment extracranial photographs

The medical history was not significant. Intraoral examination showed the molar relation as Angle's class I on both sides with a 4mm maxillary midline diastema (Fig 2).



Fig 2a-c: Pre-treatment Intraoral photographs

Treatment Objectives and treatment alternatives- Proper treatment of midline diastema depends on its etiology and accordingly different approaches can be made. Accurate diagnosis of the etiology should be the primary step followed by consideration of different objectives to achieve, treatment of the specific etiology followed by retention plan. No treatment is initiated if diastema is physiological or transient as it spontaneously closes after the eruption of permanent maxillary canines.

In general fixed type orthodontic appliance can close diastema due to improper tooth inclination, deleterious occlusal patterns ; posterior bite collapse. In our case the use of a full arch fixed appliance technique was planned to intrude the incisors while closing the diastema instead of removable appliance as that may cause a significant increase in anterior overbite.

Treatment design and progress - Preadjusted brackets with 0.022 slot inch slot were placed on the teeth. The order of arch wires was 0.014 , 0.016, 0.018, 0.017 x 0.025 NiTi wires followed by 0.017 x 0.025 and 0.019 x 0.025 SS wires. Chain elastics were used to bring central incisors in contact. The treatment period was for 2.2 years followed by retention phase. After the midline diastema closure the patient had a very pleasing look (Fig 3).



Fig 3a-d: Extraoral photographs at the end of the treatment

The teeth were in occlusion with class I molar relation and normal overjet and overbite (Fig 4). The teeth were debonded and continued with retainers.



Fig 4a-e: Intraoral photographs at the end of the treatment

DISCUSSION

Effective diastema treatment requires correct diagnosis of etiology and intervention relevant to the specific etiology. Farrer described the treatment for midline diastema and said that midline diastema is more than just a stage of development that is automatically eliminated with time, since a significant number of diastemas remain open¹⁶. There was a general trend for the mean size of maxillary midline diastema to reduce with age but it is not always eradicated with age. There are multiple factors which can cause midline diastema such as oral habits, soft tissue imbalance, physical impediments, dental anomalies, and dental / skeletal disharmonies^{17,18,19}.

A thorough medical, dental history, clinical examination and radiological examination should be done for the diagnosis of a diastema. The etiology will decide the proper treatment plan of a midline diastema. For different cases there are different protocols to be followed.

Our case was an adult female with a large midline diastema. She had full number of teeth present. As the midline diastema shows racial and familial tendencies, it was not found in this case. The midline diastema was more than 2mm and the normal growth and development causing self correction of midline diastema was over. The etiology of this case was dentoalveolar disproportion. The treatment option could have been with removable orthodontic appliance which would have closed the diastema by tipping the crowns of incisors or fixed orthodontic mechanotherapy which would have offered better control over teeth alignment. The patient had good posterior occlusion. For closure of midline diastema, bodily approximation of incisors was planned by using fixed mechanotherapy. Fixed type of appliance can provide better control in crown root angulation, overbite and overjet. Fixed mechanotherapy can close diastemas due to improper tooth inclination, deleterious occlusal patterns, posterior bite collapse, deep bite with insufficient torque or skeletal and or dental class II div 1 malocclusion²⁰.

There was decrease in excessive overjet also by moving the maxillary incisors palatally. The intrusion of incisors was also done while closing the midline diastema. Treatment was done in both the arches. The case was finished in class I molar relationship and was followed by upper lower Hawleys retainer. Since most maxillary midline diastema recur even after the best management, permanent retention was advised.

CONCLUSION

The etiology of midline diastema is multifactorial. A midline diastema is part of normal dental development during mixed dentition but still several factors can cause diastema which may require intervention. Thus in our case an attempt was made to close the midline diastema with fixed mechanotherapy followed by retention. The result of our treatment made the patient happy and satisfied with esthetics and hence giving her more confidence and boosting her self esteem.

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