

“Orthodontic treatment of midline diastema related to abnormal frenum attachment - A case series”

Running title: Orthodontic treatment of midline diastema

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ABSTRACT

Maxillary midline diastema is a common aesthetic problem in mixed and early permanent dentition. The space can occur either as a transient malocclusion or created by developmental or pathological factors. Many innovative therapies ranging from composite build up, surgical frenectomies and fixed orthodontics are available. In our cases frenectomy was performed for correction of maxillary midline diastema after the completion of orthodontic treatment. Long term retention was provided by fixed lingual retainers.

Keywords: Midline diastema , Spacing, High frenum attachment.

INTRODUCTION

A space between adjacent teeth is called a “diastema”. Midline diastemata (or diastemas) occur in approximately 98% of 6 year olds, 49% of 11 year olds and 7% of 12–18 year olds¹. The continuing presence of a diastema between the maxillary central incisors in adults often is considered an esthetic or malocclusion problem².

Midline diastema’s can be physiological, dentoalveolar, due to a missing tooth, due to peg shaped lateral, midline supernumerary teeth, proclination of the upper labial segment, prominent frenum and due to a self-inflicted pathology by tongue piercing^{3,4}. Angle and Sicher⁵ stated that an abnormal frenum is a cause of midline diastema. The extent and the etiology of the diastema must be properly evaluated. Proper case selection, appropriate treatment selection, adequate patient cooperation, and good oral hygiene all are important⁶⁻⁸. The mandibular diastema is not a normal growth characteristic. The primary etiologic factor in mandibular diastema is tongue thrust in a low rest position⁹.

Many patients seek closure of a diastema for aesthetic reasons. In the case of normal physiological development, diastemas of less than 2mm in nine-year-old children generally close spontaneously¹⁰. If they do not do so, small diastemas (less than 2mm) can be closed with finger springs on a removable appliance or with a split Essix plate, as described by Sheridan¹¹. In adults with wider diastemas, fixed appliances are required for correction so that crown and root angulations are controlled¹².

The article consists of two cases treated with fixed orthodontic brackets for the closure of midline diastema followed by frenectomy and placement of fixed lingual retainers.

Case 1:

A 21 year old patient reported to the Department of Orthodontics, Post Graduate Institute of Dental Sciences, Rohtak with the chief complaint of spacing in the maxillary anterior region. On clinical examination a thick labial frenum was observed, having a major influence on the midline diastema. A blanching test revealed a papillary frenum attachment. Patient medical history did not reveal any systemic disease. He had a Skeletal Class I relation on account of normally positioned maxilla and mandible, horizontal growth pattern, dento-alveolar Angle's Class I molar relation with generalised spacing in the maxillary arch (Fig.1.1 and 1.2).



Fig no. 1.1: Pre treatment extra oral photographs



Fig no. 1.2: Pre treatment intra oral photographs

On extra-oral examination, patient had apparently symmetrical face with an orthognathic profile. Treatment was then started using fixed orthodontic mechanotherapy using a MBT prescription. Maxillary anterior spacing was closed on a 0.019 x 0.025 Stainless steel wire using elastic chains. After closure of the spacing in the maxillary anterior region a frenectomy procedure was performed for thick maxillary labial frenum. A bonded fixed lingual retainer was given from maxillary lateral to lateral incisor following the completion of healing phase of surgical frenectomy (Fig.1.3, 1.4 and 1.5).



Fig no. 1.3: Post treatment extra oral photographs



Fig no. 1.4: Post treatment intra oral photographs



Fig no. 1.5: Post treatment fixed retention photographs

Case 2:

A 26 year old patient with the chief complaint of spacing in the maxillary midline region reported to the Department of Orthodontics, Post Graduate Institute of Dental Sciences, Rohtak.

Patient medical history did not reveal any systemic disease. Extra-oral examination revealed a Skeletal Class I relation on account of normally positioned maxilla and mandible, horizontal growth pattern with apparently symmetrical face and an orthognathic profile. Intra-oral examination revealed dento-alveolar Angle's Class I molar relation with generalised spacing in the maxillary arch (Fig.2.1 and 2.2).



Fig no. 2.1: Pre treatment extra oral photographs



Fig no. 2.2: Pre treatment intra oral photographs

On clinical examination a thick labial frenum was observed, having a major influence on the midline diastema. A blanching test revealed a papillary frenum attachment. Treatment was then started using fixed orthodontic mechanotherapy using a MBT prescription. Maxillary anterior spacing was closed on a 0.019 x 0.025 Stainless steel wire using elastic chains. After closure of the spacing in the maxillary anterior region a frenectomy procedure was performed for thick maxillary labial frenum. A bonded fixed lingual retainer was given from maxillary central to central incisor following the completion of healing phase of surgical frenectomy (Fig.2.3, 2.4 and 2.5).



Fig no. 2.3: Post treatment extra oral photographs



Fig no. 2.4 Post treatment intra oral photographs



Fig no. 2.5 Post treatment fixed retention photographs

DISCUSSION

Effective treatment of maxillary diastema requires a proper diagnosis and a relevant treatment based on its aetiology. Multi-disciplinary treatment approach involving orthodontists and periodontist can prove to be useful in solving various periodontal problems encountered during orthodontic treatment.

Abnormal frenal attachment may require removal either before orthodontic treatment or at the end of active treatment. Since most maxillary midline diastemas recur after the treatment, permanent retention is needed in most cases. In these patients, frenectomy was performed following orthodontic therapy and to prevent the incidence of relapse; a permanent retention by means of a fixed retainer was given. Inability to provide retainers could lead to a tendency of relapse of teeth leading to failure of treatment.

CONCLUSION

In the presented cases frenectomy along with fixed lingual retainers was instrumental in closure of maxillary midline diastema. These cases highlight the use of fixed lingual retainers in preventing relapse after the completion of orthodontic treatment. Also a multidisciplinary approach and proper treatment planning would lead to long term stable results for both the practitioners and the patient.

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