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The Correction of Multiple Diastemas in Adult Patients with Bad Tongue Habit (A Case Report)

Koreksi Diastema Multipel dengan Kebiasaan Buruk Lidah pada Pasien Dewasa (Sebuah Laporan Kasus)

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Abstract

There are various options in multiple diastemas correction due to the multifactorial malocclusion aetiology. The treatment of this malocclusion is a challenging task for clinicians not only for aesthetic achievement but also for the stability of orthodontic treatment. The multidisciplinary approaches depend on the aetiology of malocclusion and patient compliance. This reported case aims to describe the correction of multiple diastemas in adult patients with bad tongue habits. A 27-year-old male patient came to dental hospital Universitas Sumatera seeking orthodontics treatment with multiple spacing as the chief complaint. The comprehensive lateral cephalometry analysis showed class III skeletal malocclusion, concave profile skeletal trend, and abnormal dental inclination. There was also tongue thrusting in speech and swallowing based on functional examination. The initial orthodontic treatment was started by controlling the patient's bad tongue habit along with orthodontic treatment. After seven-month of orthodontic treatment, this malocclusion was corrected and good interdigitation was achieved. Albeit there were no skeletal significant changes in this orthodontic treatment, the dental inclination showed a significant change based on cephalometry evaluation analysis. The success of the orthodontic treatment in the adult patient is not only dependent on proper mechanotherapy but also relied on the patient's compliance with tongue habit control. Therefore, early bad oral habit detection as one of the etiologic factors in treating this malocclusion can support the success of orthodontic achievement.

Keywords: Malocclusion, diastemas, anterior, adult, tongue habit

Abstrak

Ada beberapa pilihan koreksi diastema multipel akibat berbagai faktor penyebab terjadinya suatu maloklusi. Koreksi maloklusi menjadi tantangan bagi klinisi untuk memperoleh kestabilan hasil perawatan, selain tercapainya estetika. Pendekatan multidisiplin bergantung kepada etiologi maloklusi dan kooperatif pasien. Laporan kasus ini bertujuan untuk memaparkan koreksi diastema multipel pada pasien dewasa dengan kebiasaan buruk lidah. Seorang pasien laki-laki berusia 27 tahun datang ke rumah sakit gigi dan mulut Universitas Sumatera Utara dengan diastema multipel sebagai keluhan utama. Analisis komprehensif sefalometri lateral menunjukkan maloklusi skeletal Klas III, kecenderungan profil skeletal cekung, dan inklinasi dental yang abnormal. Pemeriksaan fungsi memperlihatkan pasien memiliki kebiasaan menjulurkan lidah saat menelan dan berbicara. Perawatan ortodonti dimulai dengan kontrol kebiasaan buruk lidah pasien bersamaan dengan perawatan ortodonti. Setelah tujuh bulan perawatan ortodonti, diastema telah terkoreksi dan diperoleh interdigitasi yang baik. Walaupun tidak terlihat perubahan skeletal yang siknifikan, terlihat perubahan inklinasi dental yang siknifikan berdasarkan evaluasi sefalometri lateral. Keberhasilan perawatan ortodonti pada pasien dewasa tidak hanya bergantung pada mekanoterapi yang tepat, namun juga pada kooperatif pasien untuk mengontrol kebiasaan buruknya. Diastema multipel pada pasien dewasa tidak hanya bergantung kepada mekanoterapi yang baik, akan tetapi bergantung juga kepada keberhasilan kontrol kebiasaan buruk. Oleh karena itu, deteksi dini kebiasaan buruk sebagai salah satu penyebab maloklusi dapat mendukung keberhasilan perawatan.

Kata Kunci: Maloklusi, diastema, depan, dewasa, kebiasaan lidah

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INTRODUCTION

Anterior diastema or multiple diastemas is one of malocclusion that can affect a patient's appearance and self-esteem in long term. A diastema can be defined as a space more than 0.5 mm between the proximal surfaces of the two adjacent teeth in the maxilla and or mandible.[1,2,3,4] The aetiology of multiple diastemas is related to several factors, such as teeth malformation, agenesis, macroglossia, or bad habits such as finger sucking, lip sucking, improper tongue rest position, tongue thrusting, or genetics.[5,6] The behavioural pattern that the tongue protrudes through the anterior teeth during swallowing, speech, and at rest is termed "tongue thrusting".[7,8,9] This habit related to infantile swallowing is considered to be normal until the age of 4-5 years. The persistence of the tongue thrust habit in an adult patient can lead to deleterious effects on the oral cavity. The specific causes of tongue thrust and infantile swallowing have not been determined, but the general causes that had been proposed are a hereditary factor, thumb or finger sucking, short lingual frenulum, mouth breathing, and tonsilitis.[7,10]

The diastema occurs in approximately 98% of 6-year-olds, 49% of 11-year-olds, and 7% of 12–18-year-olds.[1] The medial erupting path of the maxillary lateral incisors and maxillary canines close spontaneously and Broadbent is mentioned as the ugly duckling stage.[1,11,12,13] The diastema in children will close spontaneously after the eruption of lateral incisors and/or canines, also termed a physiological diastema.

The persistence of diastema in adults due to tooth size and arch length discrepancies is considered an aesthetic problem or malocclusion.[1] There are various treatment modalities in diastema correction such as direct or indirect restoration[6,12,14,15,16] and orthodontic spacing closure[11,17–21].

The multidisciplinary approaches depend on the aetiology of malocclusion and patient compliance. A multidisciplinary approach is required in diastema that is related to enlarged labial frenum and deficient intermaxillary sutures. The closure of single diastema or midline diastema is helpful and relatively lesser chair time, however, it will be a challenge for multiple diastemas[17,11,22]

The aetiology of diastema should be properly evaluated to achieve optimal result and stability.[1,18] This report case aims to describe the correction of multiple diastema in adult patients with bad tongue habits.

CASE REPORT

A 27-year-old male patient came to dental hospital Universitas Sumatera seeking orthodontic treatment with multiple spacing between anterior teeth in the upper and lower arch as the chief complaint. The patient's mother and sister also had similar malocclusion history. The patient's general health was overall good and had no history of allergies, trauma, or other diseases.

There were mesoprosopic facial indexes, symmetrical facial, concave profile, and competent lips based on extraoral examination (Figure 1A). The Diastema present anterior crossbite and open bite with overjet 11/41 = 0 mm, 21/41 = -1,5 mm, overbite 11/41 =-0.5 mm. 21/31 = -1.5 mm. The dental assessment showed missing tooth 36 and crown restoration of tooth 46. Even though upper midline dental coincided with facial midline, the lower dental midline shifted 1,5 mm to the left. There was a moderate discrepancy between the Class I Canine relationship for both sides and the Class II subdivision for the Molar relationship (Figure 1B). There was also tongue thrusting in speech and swallowing based on functional examination. The intraoral examination also reported no temporomandibular joint dysfunction and macroglossia.

The comprehensive lateral cephalometry analysis showed class III skeletal malocclusion, concave profile skeletal trend, and normal mandibular growth pattern. The abnormal dental inclination showed the position of the upper and lower incisor is more protruded. Thus, the soft tissue profile of the lower lips was more protruded than the aesthetic line (Figure 2A). Panoramic radiographic analysis showed that 46 has been previously treated endodontically. There was radiolucency in the apical of this tooth without any symptom. All the teeth have erupted, except teeth 38 and 48 in the mesioangular position (Figure 2B). The fixed retainer for the lower arch and wrap-around retainer is recommended for obtaining orthodontic result stability.

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CASE MANAGEMENT

The goals of the orthodontic treatment are: (1) Eliminate the bad tongue habit, (2) Correct the multiple diastema (3) Achieve good interdigitation. The initial treatment is by instructing the patient to eliminate tongue thrusting and achieve normal swallowing and speech patterns.

The patient was instructed to place the tip of the tongue behind the upper incisors on the palate for 10 seconds routinely. The fixed orthodontic treatment with an edgewise system was begun with aligning than levelling upper and lower teeth with multiloop archwire and class III elastics during the initial three months of treatment. Retraction simultaneously with multiloop archwire in closing the diastema.

The facial profile has been improved and good interdigitation has been obtained after seven months of orthodontic treatment. Finally, the patient had a pleasant smile (Figure 3). Even though there were no skeletal significant changes in this orthodontic treatment, the dental inclination showed a significant change based on cephalometry evaluation analysis. (Figure 4, Table 1). The evaluation of panoramic radiography showed acceptable root parallelism without significant signs of bone or root resorption. The periodontal ligament of 46 showed no difference due to there was no force during the orthodontic treatment (Figure 4). Cephalometry radiograph and superimposition after seven months of treatment showed that the inclination of lower anterior teeth was better and led to a good interrelationship of upper and lower anterior teeth. The lower lip soft tissue showed an improvement after treatment as well as the nasolabial angle (Figure 5). Other skeletal cephalometry variables showed no significant differences after orthodontic treatment (Table 1, figure 5).

DISCUSSIONS

Multiple diastema especially in the anterior teeth can affect a patient's appearance which leads to lower self-esteem due to smile attractiveness and compromises dentofacial harmony.[18,23] The multidisciplinary approaches depend on the aetiology of malocclusion and patient compliance. The evaluation of the aetiology of the diastema itself and Bolton discrepancy analysis is an important issue which influences the treatment modality, timing, and retention protocol.[17,18] Thus, priority and demographic potential were considered.[22]

The malocclusion in this study related to the familial incidence that indicated a hereditary and genetic disposition since the patient's mother and sister also had this malocclusion. In this present study, the patient preferred to correct his malocclusion earlier since there was no symptom of the periapical lesion from tooth 46 and the mesioangular teeth. During orthodontic treatment, the crown tooth was bypassed due to a periapical lesion.

The patient's compliance and good oral hygiene affect the success of space closure in the correction of this malocclusion. Besides, the mandibular and facial growth patterns were in a normal range which affect the prognosis of this case. However, the major concern for orthodontists is the stability of camouflage treatment after mandibular incisor retraction due to the concave skeletal profile trend.[24] The achievement of lower anterior retraction is related to proper mechanotherapy and the patient's compliance in controlling tongue thrusting. The previous study also showed proper orthodontic treatment concurrently with bad habit management will affect the treatment result and stability.[21,22,25,27]

In this non-growing orthodontic correction, the dental inclination showed a significant change based on cephalometry evaluation analysis although there were no skeletal significant changes in this orthodontic treatment. The success of the orthodontic treatment in the adult patient is not only dependent on proper mechanotherapy but also relied on the patient's compliance with tongue habit control.[22] To acquire successful orthodontic achievement and treatment stability, early bad oral habit detection as one of the etiologic factors in multiple diastemas should be done.

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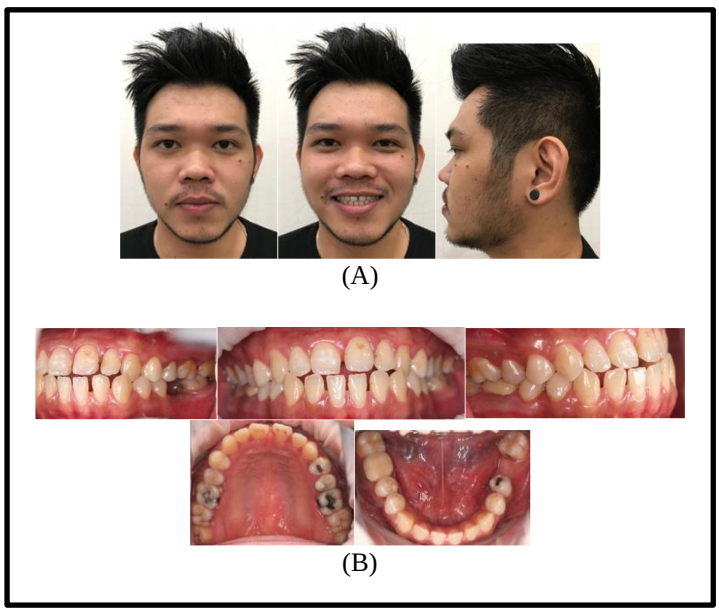
TABLES

Table 1. Cephalometry Analysis before and after orthodontic treatment

Cephalometry Variables	X Mean	SD St. Dev	Before	After
SNA^{o}	82^{o}	± 2	80^{o}	81^{o}
SNB^{o}	80^{o}	± 2	82^{o}	82^{o}
ANB^{o}	2^{o}	± 2	-2^{o}	-1.5^{o}
NAPog^{o}	0^{o}	-8.5^{o}-10^{o}	-5^{o}	-3^{o}
MP : SN^{o}	32^{o}	± 5	35 ^{o}	36^{o}
NSGn^{o} (Y axis)	65^{o}	± 3	67^{o}	68^{o}
Pog : NB mm	2 mm	± 1	+1 mm	0
SGo : NMe %	68 %	± 4	81/133 x 100% = 60.9%	81/134 x 100% = 60.4%
$\underline{1}$: $\bar{1}^{0}$	130^{o}	130^{o} -150.5^{o}	113 ^{o}	125^{o}
$\underline{1}$: SN^{0}	102^{o}	± 2	118 ^{o}	114^{o}
$\bar{1}$: MP^{0}	90^{o}	± 3	94 ^{o}	86^{o}
$\underline{1}$: APog mm	2.7 mm	-1mm–5mm	12.5	10 mm
$\bar{1}$: NB mm	4 mm	3	11.5	8 mm
E : LS mm	+ 1 mm	1.9	0 mm	-0.5
E : LI mm	0	2	+4.5 mm	+2.5

FIGURES



(A)

(B)

Figure 1. (A) Extraoral Photography before Orthodontic treatment.
(B) Intraoral Photography before Orthodontic treatment

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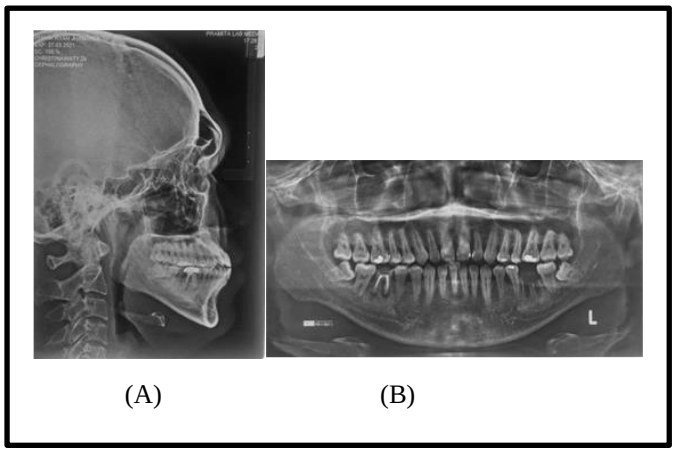
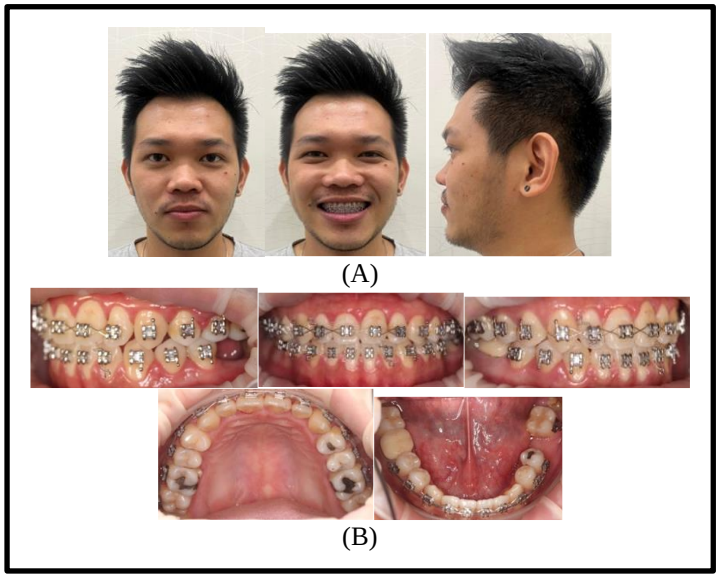


(A) (B)

Figure 2. (A) Cephalometry lateral before Orthodontic treatment.
(B) Panoramic radiography before Orthodontic treatment



(A)

(B)

Figure 3. (A) Extraoral Photography after Orthodontic treatment.
(B) Intraoral Photography after Orthodontic treatment

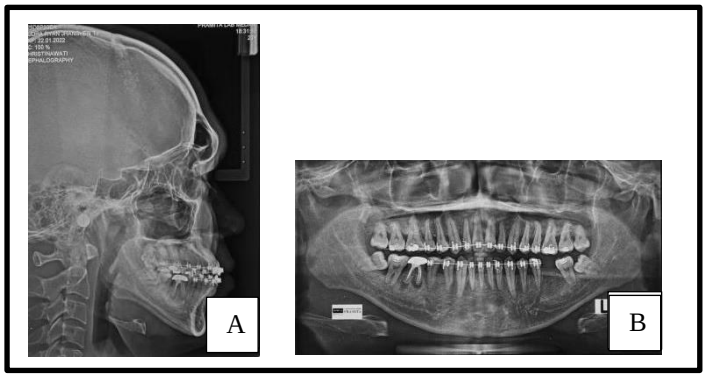


Figure 4. (A) Cephalometry lateral after Orthodontic treatment.
(B) Panoramic radiography after Orthodontic treatment

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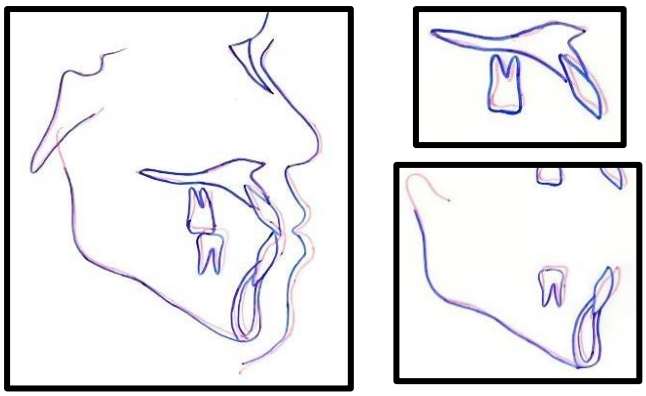

Figure 5. Superimposition of cephalometry tracing before (red line) and after (blue line) treatment

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