Accredited No. 79/E/KPT/2023
p-ISSN: 1907-5987 e-ISSN: 2615-1790

CASE REPORT

Correction of Central Diastema and Individual Dental Malposition with Removable Orthodontic Appliance

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Online submission : 22 September 2022
Accept Submission : 01 July 2023

ABSTRACT

Background: *Central diastema refers to an anterior spacing between maxillary central incisors and malposition of the individual teeth refers to the teeth being crowded in the upper and lower jaws. There are many causative factors that contribute to the occurrence of these two cases, such as heredity, frenulum deformity, gender, and bad habit. Removable orthodontic appliances are devices that can be used in cases of mild malocclusion**. Objective:*** *The purpose of writing this case report is to show that removable orthodontic appliances are the first choice for dentists.* ***Case:*** *A 23-year-old male patient came to UMY Dental and Oral Hospital (RSGM UMY) complaining that his front teeth had spacing and some irregularly arranged teeth. The patient felt uncomfortable with the condition of the teeth. Patient complaints are felt as early as 3 years ago. One year ago, had already used a removable orthodontic appliance and after the treatment is finished then used a retainer but only for 1 month because the retainer is missing. The case of this patient is class I Angle with central diastema and malposition of individual teeth.* ***Case Management:*** *Treatment is carried out using removable orthodontic appliances. The appliances component uses a simple spring on tooth 31 and 41, retentive component uses Adam's clasp on teeth 16, 26, 36 and 46. Labial arch with a U loop in between canine and first premolar.* ***Conclusion:*** *The removable orthodontic appliance should be used to correct cases of mild malocclusion such as a central diastema with mild malposition of the individual teeth.*

Keywords: *Removable Orthodontic Appliances, Central Diastema, Mild Malposition of The Individual Teeth*

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Denta Jurnal Kedokteran Gigi, Agustus 2023; Vol.17 No.2; Hal 52-56
Available at http://journal-denta.hangtuah.ac.id/index.php/jurnal/issue/view/21
DOI: 10.30649/denta.v17i2.2

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INTRODUCTION

The development of technology and science for orthodontics is very rapidly developing over time. Increasing public awareness to realize the function of teeth not only for chewing food, but also to support appearance or aesthetics.[1] Orthodontics is a science to correct the position of an untidy tooth caused by dental malposition or an error in the position of the dentition. Some dentists have started to switch to fixed appliances even though orthodontic treatment has its own indications of both fixed and removable appliances. Removable orthodontic treatment can be used for cases of mild malocclusion. [2]

Diastema is the distance between two or more teeth. [3] Types of diastema are central diastema and multiple diastema. Central diastema is the space between incisors centralis. This is caused by several causes such as heredity, frenulum deformity, gender, and bad habits. This central diastema very often causes aesthetic disorders for some people, it is an aesthetic disorder of its appearance, so many people realize and ask for help from the dentist to eliminate the condition. After the central diastema is corrected, it is expected to increase a person's self-confidence. [4]

CASE

A 23-year-old male patient came to the Dental and Oral Hospital of the University of Muhammadiyah Yogyakarta (RSGM UMY) with a complaint that the front tooth over the middle part had a gap (± 3 mm) and some mild crowding. The patient was uncomfortable with the condition of the teeth since 3 years ago. Patient has previously been treated with removable orthodontic appliances, but it is not finished when using retainer because it is missed. Patient had the habit of chewing on one side (using the left side) because right molar was cavity and felt sore when eating but the patient has had the tooth filled, the patient returns to chewing with two sides. The most recent dental treatment performed by the patient was scaling around 11 months ago. Patient brush his teeth 2 to 3 times a day when they wake up in the morning, in the afternoon when taking a shower and the night before going to bed.

According to the patient's confession, the father has a medium jaws size and normal tooth size, the patient's father is healthy and is not suspected of having a history of systemic diseases. The patient's mother is suspected of having a history of malposition teeth and is not suspected of having a history of systemic diseases.

The patient's social life is a student of Magister of Law at UGM Yogyakarta. The patient has a busy life as a construction contractor as well as having an irregular diet. The general medical history of the patient is not suspected of having systemic diseases. The patient in 2015 was once hospitalized due to a blood clot in his brain.

CASE MANAGEMENT

The patient first came to RSGM on March 03rd 2021, for indications then printed. The results of the extraoral examination obtained the results of the patient's head index, namely 83 (mesosphaly) and a face index of 135.2 (hyperleptoprosop). The patient's facial profile was convex with measurements of normal right maxillary Simon lines (1/3 distal C) and left prognation (1/3 mesial P1) normal right mandible (interdental C-P1) and left prognation (distal P1). Free Way Space (FWS) of 3 mm (normal) was obtained. The results of the intraoral examination of the patient obtained an overjet of 3.3 mm, an overbite of 3.7 mm. The first molar relation is right: class I Angle, left: Class I Angle. Right canine relation: class I, left: class I. Profile photo of the patient's face as shown in figure 1. Photo of the patient's centrist relationship as shown in figure 2. While the photo looks occlusal as shown in figure 3. The curved shape of the teeth of the upper jaw and lower jaw is parabolic,

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symmetrical. Individual dental malpositions of the patient as follows: 24: Dystopalatotorsiversion, 35: Distolabiotorsiversion, 31: Mesiolinguotorsiversion, 41: Mesiolinguotorsiversion, 42: Distolabiotorsiversion, 44: Mesiolinguotorsiversion, 47: Bucoversion. With central diastema between teeth 11 and 21.

Figure 1. Photo of the patient's face.

Figure 2. Photo of the patient's centrist relationship.

Figure 3. Photo of the patient's occlusal.

There were 4 calculations carried out in the case, namely: Pont, Korkhaus, Howes and curvilinear determination. The results of the calculation of Pont are (1) Growth and development in the lateral direction in the inter P1 region experienced a mild contraction of – 0.4 mm; (2) Growth and development in the lateral direction of the inter region M1 experienced a moderate distraction of +5.2 mm. The result of Korkhaus calculations was growth and development of the dental arch in the anterior direction a mild protractation of +0.6 mm. The results of Howes' calculations are: (1) The P index was obtained 44.13% so that the dental arch can accommodate the dentition in an ideal and stable curved state because the P index value > 43%; (2) The Fossa Canina Index (FC) was obtained 47.28% so that the basal arch can accommodate the dentition in an ideal and stable curved state, because the FC index value >44%. Meanwhile, the results of the calculation of curved determination were obtained: (1) discretion in the upper jaw, namely the right +2 mm and the left +1.2 mm; (2) discretion on the lower jaw, namely the right -0.8 mm and the left 0 mm. The conclusion of some of these calculations indicated that the patient's condition can be carried out by the administration of removable appliances.

The diagnosis in this case was malocclusion Angle class I Dewey type 1 dentoskeletal accompanied by individual dental malpositions as follows: 24: Dystopalatotorsiversion, 35: Distolabiotorsiversion, 31: Mesiolinguotorsiversion, 41: Mesiolinguotorsiversion, 42: Distolabiotorsiversion, 44: Mesiolinguotorsiversion, 47: Bukoversion. The treatment performed on the patient is an active plate with a short labial arch to correct the diastema. As for the lower jaw, it uses an active plate with a simple spring component to correct the malposition of individual teeth with the design of the tool as shown in figure 4.

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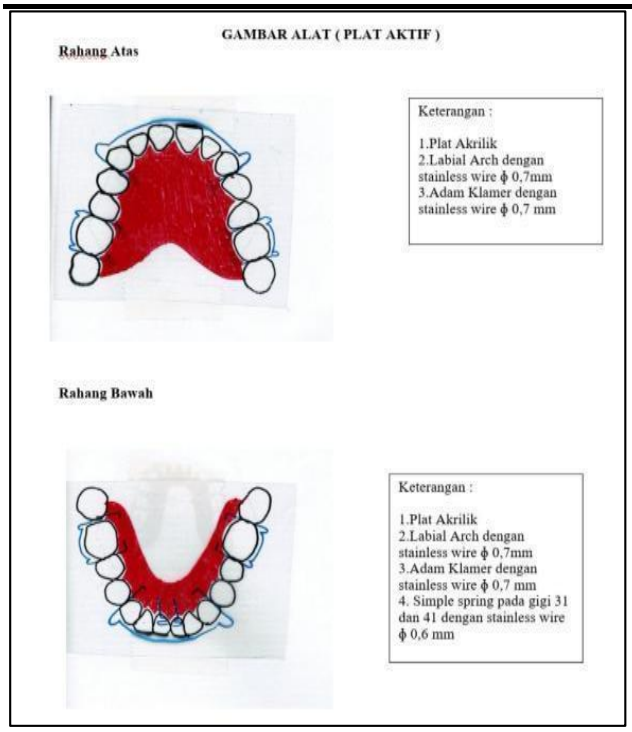

Figure 4. The design of patient's appliances with Adams clasp on teeth 16, 26, 36, 46, labial arch with arm between teeth 13-14, 23-24, 33-34, 43-44.

DISCUSSION

Dental malocclusion can occur when there is a connection between the teeth of the upper jaw and the lower jaw. Dental anomalies, abnormal numbers and dental development can also cause malocclusion, along with genetic, environmental factors and can be due to a person's bad habits.[5] Malocclusion not only causes one problem in development, but there are many things that occur due to dental malposition, including physical pain, limited movement, poor oral hygiene and can also cause periodontal health, the opportunity for caries, traumatic teeth and the worst problems can cause TMJ problems.[6] Diastema is a condition in which there is a gap between two teeth. The distance between the midlines of the upper jaw teeth can occur when the teeth mix and the permanent teeth.[7]

The etiology in this case was heredity factor.[8] In the above description it was stated that the patient's bad habit was not related to the patient's complaint and also the frenulum attachment of the patient was normal. It has been shown that the treatment carried out to the patient is for eight months with the activation of the appliances or control visits as many as ten times. The operator performed oral hygiene index (OHI) measurements on patients at the beginning of each visit. After that, the operator performed checks on the plate: (1) the effectiveness of the tool; (2) there are parts that are traumatic or not. The operator also performed calculations on the premolar index to see the results of the expansion used. The operator performed control on the patient by scheduling once a week. At the time of control, activation of the simple spring in teeth 31 and 41 was carried out and activation of the labial arch of the upper jaw to close the diastema.

There were changes leading to the patient's ideal occlusion. Individual gear malposition in element 24: mesiolabiotorsiversion (uncorrected); 31: mesiolinguotorsiversion (corrected); 35: distolabiotorsiversion (uncorrected); 41: mesiolinguotorsiversion (corrected), 42: distolabiotorsiversion (uncorrected); 44: distolabiotorsiversion (uncorrected) and 47: bukoversion. The central diastema in 11 and 21 was corrected, the overbite remained 3.7 mm and the overjet corrected from 3.3 mm to 2.7 mm in 8 months (in Figure 5).

Figure 5. changes in the condition of the patient's dental arch to be more ideal.

There are obstacles faced by operators because patients are sometimes not diligent in using appliances, patient has a busy schedule so it is difficult to get to RSGM UMY, the patient

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rarely cleans his tools during the beginning of treatment, so the patient should always be educated not to forget to clean the appliances.

CONCLUSION

The treatment carried out on the patient was to use removable orthodontic appliances, in the lower jaws with the addition of simple springs and in the upper jaw, a reduction of verkeilung was carried out so that the diastema closed. The treatment was declared effective for correcting the patient's dental malposition characterized by closing the diastema as well as correcting the malposition of the patient's teeth leading to the ideal arch.

ACKNOWLEDGMENTS

We thanked Muhammadiyah University Yogyakarta for providing the financial and facilities support for this case and research.

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