"Case Report"

Relapse Correction with Removable Orthodontic

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Abstract

Relapse is when the teeth return to the position before orthodontic treatment. The small gaps between teeth often occur due to relapse conditions. A removable appliance is an orthodontic appliance that the patient can remove and insert themselves. This aims to report a relapse case treated using removable orthodontics. The case, A 26-year-old female patient complained of upper front teeth being gapped and lower front teeth being crowded. Previous dental history showed that the teeth had been treated with a fixed orthodontic appliance one year ago with premolar extraction. The patient did not use a retainer. The removable orthodontic appliance used was an active plate that retracted the maxillary anterior teeth using a labial bow. Orthodontic relapse can occur due to incomplete remodelling. Retraction using a labial bow can close the anterior teeth palatally. Active plates can be used as an alternative treatment in mild cases of relapse after fixed orthodontic treatment.

Keywords: active plate; orthodontic; relapse

INTRODUCTION

Removable orthodontics is a device that can be removed and installed by the patient with the principle of tipping movement, or the crown is tilted simply around the fulcrum at the centre of the tooth. Removable orthodontics have several advantages, namely easy to clean, removable, can improve vertical and horizontal anchorage due to the presence of acrylic plates on the palatal side, in growing children can produce efficient overbite reduction and can pass chewing load to the teeth properly.¹ Orthodontic treatment aims to achieve occlusal balance and stable correction of the teeth, but there is an essential problem with orthodontic treatment, which is the occurrence of relapse.²

Relapse is when the teeth return to the position before orthodontic treatment.³ Relapse can occur if the tooth-supporting tissue is not fully formed after orthodontic treatment.⁴ Relapse after orthodontic treatment still involves the role of alveolar bone; it is a modelling and remodelling process that still requires osteoclast activity.⁵

Some people with diastemas do not close spontaneously. Diastema between the maxillary central incisors in adults is considered a malocclusion and aesthetic problem.⁶

Orthodontic treatment is performed to correct malocclusion in the dentition. Orthodontic treatment is divided into two, namely fixed orthodontics and removable orthodontics. Removable orthodontics can be used in cases of simple malocclusion where only minor abnormalities in the position of the teeth are involved, while fixed orthodontic devices can be used in cases of severe malocclusion.⁷,⁸,⁹

The appliance components in removable orthodontics are divided into several parts, namely acrylic plate, active, anchor, and retention components. The active component is the component that generates the force which serves to move the teeth consisting of spring, retractor, labial arc, screw, and elastic.⁷

The purpose of this case report is to describe the treatment of multiple spacing relapse after using fixed orthodontic appliances with removable orthodontics.
CASE REPORT
A 26-year-old female patient complained of a gap in her upper front teeth. She felt that the condition caused frequent food slippage. The patient complained that the lower front teeth started to become untidy approximately 5 months ago. The patient's dental history had used a fixed orthodontic appliance with the extraction of four first premolars. The patient did not use a retainer after fixed orthodontic treatment. Clinical examination showed that the molar relation was neutroclusion, overjet 3 mm, overbite 4.5 mm, multiple spaces of maxillary anterior teeth and individual tooth malposition of mandibular anterior teeth (Fig 1).

Fig 1. Pre-treatment intra oral photos; A. Right view; B. Frontal view; C. Left view; D. Upper Occlusal view; E. Lower Occlusal view.

OPG X-rays showed the absence of the first premolar as it had been extracted for fixed orthodontic treatment. Periodontal tissue and alveolar bone were in normal condition with no abnormalities (Fig 2).

Fig 2. Pre-treatment OPG X-rays

CASE MANAGEMENT
In this case, orthodontic relapse treatment uses a removable orthodontic appliance in the form of an active plate. The retentive component is Adam Klamer, while the active component is the finger spring and labial arch. Checking the retentivity and stability of the removable orthodontic appliance during insertion is very important. The patient adapts to using the active plate for one week; then, the patient does routine control every one week.

Fig 3. Orthodontic removable appliance for relapse correction

Activation of the finger spring on teeth 13 and 23 by moving the spring arm by 1/3 the width of the mesiodistal surface of the tooth. The canine distalization procedure takes quite a long time due to the long roots of the canine teeth. When the canine is positioned so the gap moves between the lateral incisor and the canine, the finger spring is cut, causing anterior retraction of the maxilla by compressing the U loop on the labial arch (Fig 3).

Fig 4. Post-treatment intra oral photos; A. Right view; B. Frontal view; C. Left view; D. Upper Occlusal view; E. Lower Occlusal view.

Figure 4 shows the maxillary tooth gap has closed, and the mandibular crowding is corrected.

DISCUSSION
The treatment duration of a removable orthodontic appliance is based on the standard criteria of the appliance used in a removable orthodontic treatment. Orthodontic treatment aims to achieve occlusal balance and stable correction of the teeth, but there is an
essential problem with orthodontic treatment, which is the occurrence of relapse.\(^2\) Relapse is when the tooth returns when the tooth-supporting tissue has not been fully formed after orthodontic treatment.\(^4\) The leading cause of relapse is still the remodelling process in the periodontal ligament fibres and alveolar bone.\(^{11}\) In this case, the labial arc can be used as a stability device to maintain the anterior dental arch and increase the plate retention in a passive labial arc. The active labial arc closes the diastema on the anterior teeth, retracts the anterior teeth on removable devices, corrects mild overjet, and closes the gap between the teeth.\(^{12}\)

A labial bow is a wire curved and attached to the labial surface of the anterior teeth. The labial bow is made of stainless steel wire \(\Phi 0.7\) mm and is a part that has several functions, namely as a stabilisation, retention, and active component.\(^9\) This case uses a long labial bow, a labial bow wire along the right first premolar to the left first premolar using stainless steel wire \(\Phi 0.7\) mm and can be used as an active or retentive component. It can be indicated to close some gaps in the anterior teeth, reduce mild overjet, and close the gap on the distal part of the canine how to activate the labial arc by pressing on the lup 1-2 mm so that the arc will pull the tooth towards the palatal approximately 1 mm.\(^{13}\) Moving teeth with a single root requires a force between 20-40 grams / mm\(^2\). If the force is given more than 40 grams/mm\(^2\), it can damage the periodontal tissue, and the patient feels excessive pain.\(^{13}\)

Measuring success in removable orthodontic treatment can be influenced by several factors, including the patient herself and the orthodontic appliance design. If the design is appropriate and the patient's level of cooperation in using the removable orthodontic appliance is high, the treatment will be maximized.\(^{14}\) The removable orthodontic treatment could also involve retention and stabilisation procedures for teeth with the use of retainers to reduce the chances of relapse or malocclusion.\(^{15}\)

**CONCLUSION**

Removable orthodontic treatment is effective for closing minor tooth gaps due to relapse of fixed orthodontic treatment.

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**REFERENCES**


