

Case Report

A witty hand of orthodontic treatment- Fixed partial appliance

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ARTICLE INFO



Keywords:

malocclusion, fixed orthodontics appliance, 2x4 appliance, 2x6 appliance, interceptive orthodontics

ABSTRACT

Children in mixed dentition stage undergoing a transition from primary to permanent teeth with malocclusion are often delayed for treatment till the eruption of all permanent teeth or are given removable appliances which can bring about only limited tooth movement. The need of providing interceptive treatment in such cases so that it prevents further complications in future has lead to the increased use of a new treatment protocol called partial fixed treatment.

Introduction

A stage of transition of dentition from primary to permanent teeth is the time which most commonly presents with malocclusion due to multiple contributing factors. Such a period has always been in controversy in regards of time of initiation of treatment and which treatment should be undertaken. Apart from this, one also has to be very clear with what “should be” or “should not be” treated at this stage.¹⁻³ This is because, there are many self correcting malocclusions too which are evident in this time frame, but will resolve once the transition is complete. Partial fixed treatment is one such treatment option which helps in early correction of simple and minor malocclusions like rotation or malpositioning involving one or more teeth. It can also help in correcting complex malocclusions which are to be taken up in two steps i.e early correction of mild malocclusions by fixed partial appliance and comprehensive treatment in second step. Greater privilege to early correction of malocclusion is given because of the fact that it will prevent further complications in malocclusions if left untreated and also

correct the relationship of malaligned or malpositioned with its opposite and contralateral tooth.⁴ Another very significant contribution of this treatment option is at the end of a comprehensive treatment which requires final fine adjustments of individual tooth alignment.⁵⁻⁷

Following are the case reports of patients with different forms of malocclusion treated by 2x4 or 2x6 appliance.

Case Report-1

A 12 year old female had reported to the department of pedodontics and preventive dentistry with the chief complaint of both lateral incisors in maxillary arch palatally placed. On examination, 12 and 22 were found in crossbite with 2mm space between maxillary central incisors. This was treated using a typical fixed partial appliance called 2x6 appliance, as it engages both the maxillary first permanent molars and central incisors, lateral incisors and canine in its set up. 0.022” slot brackets were bonded onto the six anterior teeth and prefabricated band with soldered tube was cemented on maxillary first permanent molars of both quadrants with

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Case I Pre-Operative**During Treatment****After Treatment****Case II Pre-Operative****During Treatment****After Treatment****Case III Pre-Operative****During Treatment****After Treatment**

0.016" round NiTi wire used initially for alignment for 8 weeks.

An echain was used to close the diastema between 11 and 21.

One important modification done in this case was rotation of brackets by 180° and then bonding it on both the lateral incisors, bonding the right bracket on right and left bracket on left maxillary lateral incisor. This is done to counteract the exaggerated palatal root torque of maxillary lateral incisors if the brackets were placed without 180° rotation.

0.017"x 0.023" rectangular NiTi wire then replaced the initial wire and was kept till there was no deflection seen in wire (it took 4 weeks).

Last and final arch wire used was 0.019"x 0.025" rectangular stainless steel wire for consolidation and

complete expression of the inbuilt tip and torque of the bracket.

Bite was raised on both the sides by bonding glass ionomer cements on the occlusal surface of mandibular first permanent molars.

The crossbite of lateral incisors took 6 months for correction using this treatment option.

case report-2

A 11 year old female patient had come to the department of pedodontics and preventive dentistry with chief complaint of reverse bite in front teeth. After having treated the case with chin cup and jack screw on maxillary incisors, the fine adjustments of alignment and consolidation of overjet and overbite was obtained by similar partial fixed appliance which was a 2X4 appliance. That is, it engages both maxillary first permanent molars and central and lateral incisors.

Similar bands and brackets were applied on these teeth as in case 1, with sequential change of wire from 0.016" round Niti wire placed initially for 4 weeks, followed by 0.017"x 0.023" rectangular NiTi wire for another 4 weeks. After this, 0.019"x 0.025" rectangular stainless steel wire was placed for three weeks.

Then an open coil spring was inserted between maxillary lateral incisor and first permanent molar in both the quadrants to bring about the needed overjet and to regain the lost space of maxillary canine.

The maxillary incisors were tied together with ligature over the 0.019"x 0.025" rectangular stainless steel wire to bring about uniform labial tipping of crowns of all four maxillary incisors.

The entire treatment took 4 months to get completed.

Case Report-3

A 10 year old male patient had reported to the department of pedodontics and preventive dentistry with the chief complaint of irregularly positioned maxillary central incisor. On examination, right maxillary permanent central incisor was labially placed. After looking out for any other abnormality which was not found, choice of 2x4 appliance was made to correct the minor malocclusion. It was done using same technique as in case 2 with final correction achieved in as less as 2 months with permanent bonded lingual retainer given till the eruption of permanent canines. This is done because these malocclusions once corrected are very notorious to return back to their original state if not kept in their new position till its periodontium has not adjusted to final position.

Discussion

A typical fixed partial appliance for mixed dentition treatment consist of a "2x4" or "2x6" arrangement i.e 2 molar bands and 4 or 6 bonded anterior teeth. Before

usage of such a treatment protocol, it is needed to be very clear with the treatment goals. This is important because if not set with it can cause two problems-

- 1) Patients can "burn out" of the enthusiasm needed for treatment by the time they are ready for comprehensive treatment
- 2) Chance of damage also increases with increase in the treatment time.⁴

If used cautiously, this appliance can be very advantageous in correction of malocclusion. It provides with advantages like-

- 1) simple and quick method of aligning a single or few teeth in malalignment without involving the entire dentition.
- 2) Fewer number of teeth involved in this treatment option also allows the patient in better management of oral hygiene.
- 3) Patient cooperation in wearing of appliance is also not needed.
- 4) Prevents further complication of malocclusion if left untreated by attempting early correction.
- 5) A biomechanical advantage of easier intrusions with this as it has long spans of wire which keep orthodontic force light and allow appropriate moments to be generated.⁴

With all these advantages, there are following points too which are to be seen and kept in mind while using it-

- 1) The longer arch wire spans with wires that themselves are more springy may lead to displaced or broken appliance and associated soft tissue trauma because of wire deflection.
- 2) Limited anchorage provided by just the two maxillary or mandibular first permanent molars, also limits the kind of tooth movement that can be taken up by this method.

- 3) The effect of the tooth movement on unerupted teeth is also to be considered which if left unnoticed can dramatically alter the course and direction of treatment.
- 4) Buccal or lingual movements of unattached teeth might occur as a result of unresolved vector of orthodontic force.
- 5) Retention needed till the eruption of all permanent teeth.

After having cautiously measured the risk benefit ratio of this treatment option like any other treatment option, provides us with a quick, simple and revolutionary contribution in the branch of interceptive orthodontics.

SUMMARY-

To conclude, one should be very carefully in selecting patients to be treated with fixed orthodontic appliance. Fixed partial appliance being one type of fixed orthodontic appliance can be used in variety of clinical situations with only minor modifications in the appliance design.⁸⁻¹⁰

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How to cite this article:

Fatima J, Jain P, Pathak AK, Angrish P. A witty hand of orthodontic treatment- Fixed partial appliance. JOADMS 2015;1(3):86-89.

Source of Support: Nil,

Conflict of Interest: None declared