



International Journal of Applied Dental Sciences

ISSN Print: 2394-7489
ISSN Online: 2394-7497
IJADS 2018; 4(2): 135-137
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www.oraljournal.com
Received: 03-02-2018
Accepted: 05-03-2018

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A modified nance appliance for derotation of the tooth

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Abstract

De-rotation of posterior teeth provides space which can be utilized for relieving crowding in the anterior region. De-rotation of the teeth if, carried out with continuous wire can lead to unwanted rotation of the teeth from which forces are applied. Couple forces applying equal and opposite forces can be judiciously used for correction of rotations.

Keywords: Premolar de-rotation, modified Nance appliance

Introduction

Rotation of any tooth results in malocclusion which needs the attention of an orthodontist to derotate the tooth or teeth in either of the maxillary arch or the mandibular arch to obtain a stable occlusion, finer esthetics and functional harmony for the patient. Derotation of canines or premolars must be carried out during the initial phase of fixed orthodontic mechanotherapy. The anterior teeth are easy to derotate by means of elastic arch wires, whereas the extreme rotation of premolars and canines is a greater problem for the orthodontist [1]. Every patient undergoing orthodontic treatment desires early finishing of orthodontic procedure. So quick and rapid correction of malocclusion becomes an important objective for orthodontist. To achieve this objective, Modified Nance Palatal Arch was fabricated [2]. De-rotation of posterior teeth provides space which can be utilized for relieving crowding in the anterior region.

The aim of this case report was to introduce an appliance that can be used for correcting severe rotation of premolars as well as for correction of tongue thrusting habit in patients. Usually canines and premolars are de-rotated during fix orthodontic treatment. If de-rotation is carried out on Ni-Ti wires during the levelling phase, it causes undesirable force and unwanted tooth movement of neighbouring teeth [3, 4]. A special Nance palatal arch was designed to prevent undesirable effects of continuous elastic wire ligation on the neighbouring teeth. The succeeding case report is of 23 year old female patient with tongue thrust habit, increased overjet and rotation in premolar, a modified nance appliance was given to treat the patient of her tongue thrust habit and to derotate the premolar.

Case Report

A 23 year old female patient came to the Department of Orthodontics and Dentofacial Orthopedics, Mahatma Gandhi Dental College and Hospital, complaining of gaps in upper front teeth. The patient was in permanent dentition. On extra oral examination patient presented with straight profile, mesoprosopic facial form, straight facial divergence, acute nasolabial angle and with incompetent lips. Intraorally patient presented with class I molar relationship with overjet of 7mm. and overbite of 2mm.



Fig 1: extra oral photo



Fig 2: intra oral photo

Teeth present.

16 15 14 13 12 11 21 22 23 24 25 26
46 45 44 43 42 41 31 32 33 34 35 36

Diagnosis

Angle's Class I type 2 Malocclusion on class II skeletal bases due to Retrognathic mandible, Vertical growth pattern, rotation i.r.t 14, 15, 24, 25, 22, 23, tongue thrusting and unilateral chewing habit.

Treatment objectives

- To achieve normal inclination of upper and lower anteriors.
- To achieve normal overjet.
- To maintain class I molar, and class I incisor relationship.
- To achieve class I canine relation on left side.
- To achieve good facial profile.

Treatment plan

Case was treated as a Non- extraction case. Fixed orthodontic Treatment with MBT. 022" appliance was carried out for a period of 1 year and 5 months to correct dental problems. Alignment and leveling of upper and lower arches

was carried out for the period of seven months. Modified Nance button for anchorage maintenance, premolar de-rotation as well as the correction of tongue thrust habit was given to the patient.



Fig 3

To correct Bolton discrepancy, crown build up was done in relation to 12 and 22. Space closure was carried out after alignment and leveling for the period of six months. Post space closure, finishing and detailing was carried out for the period of 2 months.



Fig 4

Wire sequence

Upper: 0.016 NiTi, 0.016×0.022 niti
0.017×0.025 SS, 0.019×0.025 SS
Lower: 0.016 NiTi, 0.016×0.022niti,
0.017×0.025 SS, 0.019×0.025 SS
Retention: Upper Hawley's retainer
Fixed lingual retainer

Fabrication

Fixed Modified Nance button for anchorage maintenance, premolar de-rotation as well as the correction of tongue thrust habit was given to the patient. Beggs bracket were bonded on the buccal and lingual aspect of rotated premolar. Couple forces were given for correction of rotation from palatal aspect of 24 to tongue crib and from buccal aspect of 24 to molar tube on 26. Forces on the buccal side were applied with the help of elastic chain from the molar tube to the beggs bracket for distolingual rotation of the 24. Another force was applied on palatal side with the help of elastomeric chain from beggs bracket to modified nance button. (Figure 2). The advantages

of this Modified Nance button was anchorage maintenance, premolar de-rotation as well as the correction of tongue thrust habit.

Discussion

Derotation of tooth is easier to correct and difficult to retain so it should be over corrected and often accompanied by supracrestal fibrotomy or percision. De-rotated teeth have a strong tendency to relapse and so should be retained full time for at least 6 months^[5]. A fixed modified nance palatal button was fabricated for anchorage and simultaneously derotation as well as correction of tongue thrusting habit altogether. The fourth key to normal occlusion is that the teeth should be free of undesirable rotations. A rotated molar or bicuspid occupies more space than normal. A rotated incisor occupies less space than normal. In a couple system of derotation elastics are attached on lingual side and buccal side to correct derotation. The treatment objectives set for this case, were achieved due to the good compliance by the patient. The modified Nance appliance is considered to be an efficient method of anchorage reinforcement; however, much of the perceived

advantage is based on clinical judgment [6].

Conclusion

Modified Nance appliance is a fixed appliance which can efficiently correct tongue thrust habit as well as severely rotated posterior teeth in a relatively short duration of time. De-rotation of posterior teeth provides space which can be utilized for relieving crowding in the anterior region. De-rotation of the teeth if, carried out with continuous wire can lead to unwanted rotation of the teeth from which forces are applied. Couple forces applying equal and opposite forces can be judiciously used for correction of rotations.

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