CASE REPORT

PASSIVE SELF-LIGATION AND EDGewise BRACKETS FOR MANAGEMENT OF UNILATERAL CLEFT PALATE
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ABSTRACT
This paper reports a case of 16-year old male patient with unilateral cleft lip and palate managed by orthognathic surgery and orthodontics using passive self-ligation and edgewise brackets. Orthodontic treatment includes passive self-ligating brackets in the upper and conventional edge-wise brackets in the lower arch. The pre surgical phase includes unilateral distalization, wire expansion of the upper arch followed by Le Fort I surgical procedure for maxillary advancement. The optimum occlusion was obtained within a short post surgical phase. Following one-year retention period skeletal relapse was absent with satisfactory occlusal stability.

Keywords: Cleft Palate; Edgewise Brackets; Le Fort I; Orthodontic; Passive Self-Ligation

Introduction

Clefts of lip and palate are complicated congenital craniofacial malformation that occur in about every 1000 live births in Iran.1 From an orthodontic point of view, involved patients present several dental and skeletal problems including anterior and posterior cross bite, mild class III malocclusions, hypodontia, teeth malformations and abnormal eruption patterns.2 Orthodontic tooth movement in these patients is often limited by lack of adequate bone support which strictly restricts the dento-alveolar compensation.3,4 The patients often need arch expansion protocols in addition to anterior movement of anterior dento-alveolar segment either by orthodontic treatment or orthognathic surgery or a combination of both treatment modalities.5 According to the available literature, several treatment modalities have been used to address the upper collapsed arch before or after grafting procedure. It is observed that none of them has any outstanding advantages over the rest. On the other hand, there have been several claims on benefits of using passive self-ligating brackets in comparison with conventional edge-wise brackets. These include induced buccal bone growth during expansion, greater dental arch expansion and better long term stability.6,7 Most of these advantages have been proved in laboratory situations. In clinical application there were no statistically significant differences in arch expansion was noted between the self-ligating and conventional edgewise brackets.7

The alveolar defect in cleft patients is mainly due to the presence of alveolar rupture or scar tissues formation following surgical grafting procedures. This indicate lateral alveolar expansion to correct the buccal lingual orientation of the collapsed posterior segments and to improve the stability.8 Therefore, the differential use of self-ligating brackets in upper arch in combination of conventional edgewise brackets in the lower arch of the cleft patients achieve arch expansion. This paper reports a case of 16-year old male patient with unilateral cleft lip and palate managed by orthognathic surgery and orthodontics using passive self-ligation and edgewise brackets.

Case Report

A 16 year-old-Iranian boy was referred to Orthodontic Department with a chief complaint of poor esthetics and crowding of upper teeth. History reveals cheiloplasty at the age of three months with mild form of characteristic nasalized speech. Medical history was non-contributory. Clinical examination revealed unilateral cleft lip and palate with upper crowding with no tempromandibular disorder symptom. Patient had a symmetrical face with a straight profile and adequate soft tissue compensation with no significant mandibular protrusion at pre-orthodontic treatment Phase.

Intra oral examination revealed anterior and bilateral posterior cross bite secondary to narrow upper dental arch and presence of a premature contact between the maxillary and mandibular central incisors (Figure 1-5). There was a 2.5 mm midline deviation between maxillary and mandibular midlines. The mandibular midline was almost coinciding with his facial midline. In maxilla an over retained right primary canine with a palatally erupted permanent left lateral incisor was present. The overbite was minimal with negative overjet, crowding in the upper arch (10 mm) and lower arch (4 mm). The angle classification was class III canine and molar relationship on the cleft side (right side) and class II canine and molar relationship on the opposite side, secondary to lateral incisor displacement.

The panoramic radiograph and periapical projections showed an alveolar maxillary cleft on the right side with right missing first premolar. Cephalometric analysis confirmed a skeletal class III relationship with excessive anterior vertical dimensions and lingually inclined upper incisors (Figure 6,7). The main objective for the proposed treatment protocol was a) reducing the buccal corridor to expand the upper arch both anteriorly and laterally, b) provide adequate space to eliminate upper arch crowding followed by alignment and leveling in the upper arch, c) align upper and lower dental midlines with facial midline, d) enhance esthetic smile by increasing upper incisor display and e) provide optimal arch coordination to maintain mandibular arch width in inter-canine and inter molar regions.

The treatment plan included, a) extraction of the over retained primary canine, b) extraction of the palatally placed lateral incisor to avoid the relapse of the segment following the space closure, c) reshape the canine to lateral incisor. The treatment alternatives to manage the crowding in the right quadrant before upper arch expansion includes, a) orthognathic surgery involving 3-piece maxillary sectional expansion, and simultaneous distalization of the upper right segment with anterior
16-20. Intraoral pretreatment photographs after one year follow up. and lateral cephalometry of the patient after treatment, Figure 15.

Discussion

The heterogeneity of maxillary expansion treatment modalities in the wide range of outcome measures pose a distinct restriction on the ability of the clinicians to decide the most efficient maxillary expansion approach for each cleft patient. Using self-ligating brackets in upper arch and a conventional edge-wise system in the lower arch in conjunction with orthognathic surgery, might be advantageous for resolving residual dentofacial problems.

Conclusions

In conclusion, combined use of self-ligating and conventional edge-wise brackets for upper and lower jaw respectively, can be an effective treatment modality to address the transverse arch constriction of the cleft patients.

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References


How cite this article


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Source of Support: Nil-
Conflict of Interest: None Declared