

Evaluation Treatment Outcomes of Anterior Open Bite Treated with Maxillary Intrusive Force by Temporary Anchorage Devices.

A proposal

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**In
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Introduction

Anterior open bite may be defined as: That condition where the upper incisor crowns fail to overlap the incisal third of the lower incisor crowns when the mandible is brought into full occlusion. Within the limits of this definition, the degree or severity of malocclusion may vary from a mild edge to edge relationship of the incisor teeth to a severe and handicapping malocclusion⁽¹⁾.

This type of malocclusion like any other malocclusion is the result of certain causes either of hereditary or non-hereditary origin that act pre- or post-natally on the tissues of the orofacial region. Few malocclusions have a single specific cause. more often they are the result of a combination of many factors operating within the inherent predetermined growth potential of each individual patient⁽²⁾.

Morphology of Dental Open Bite: the shape of the maxillary arch will show characteristic features related to the etiology. If the malocclusion is due to a foreign body (pencil, pipe) being held passively between the incisor teeth, then the open bite is localized to the particular teeth involved; they will fail to erupt to the occlusal level of the other teeth in the arch.

The same clinical appearance is evident in cases having ankylosed upper or lower incisor teeth. When the malocclusion is as a result of a thumb sucking habit, then the upper incisor teeth may be proclined resulting in a V-shaped upper

arch. Due to the increased buccal pressure exerted on the molar teeth by the cheeks during sucking, there is a narrowing of the arch in the molar region ⁽³⁾.

The mandibular incisor teeth are slightly depressed and lingually inclined. In occlusion, the anterior open bite has a characteristic appearance. The opposing molars and Premolars are in contact, the canines may or may not be in contact, the lateral and central incisors are in frank open bite, the mouth has the appearance of a 'fish mouth'⁽⁴⁾.

Cephalometric characteristics as this malocclusion is a dental condition rather than a skeletal problem, there are no special skeletal features evident, in the maxilla there is no increase in height from the cusp's tips of the molars to the palatal plane, but there may be a decrease in the vertical height measured from the mesial edge of the upper incisors to the palatal plan⁽⁵⁾.

In the presence of an increased overjet, the cephalometric analysis will show both angular and linear evidence of proclined upper incisor teeth. The mandible may show retroclined and crowded lower incisors may result from a thumb sucking habit. The alveolar height in this region is not increased⁽⁶⁾.

It is well recognized that anterior open bite malocclusion is one of the most difficult orthodontic problems with regard to treatment and stability , they recognized that a 'dental malocclusion' has a better prognosis than a 'dento-skeletal malocclusion'⁽⁷⁾.

The conventional orthodontic treatments for the correction of an anterior open bite include bite blocks, high-pull headgear, and new facemask designs. to achieve dentoalveolar intrusion of the maxillary posterior segments. Fixed mechanics, multiloop edgewise archwires, extraction therapy, intermaxillary vertical elastics, and inhibition of molar eruption during growth have also been used to treat the anterior open bite.⁽⁸⁻¹⁰⁾.

These modalities have been recommended for intrusion of the maxillary posterior segment and anterior dentoalveolar extrusion. However, none of these treatment approaches are satisfactory because of negative effects on the skeletal and/or esthetic pattern and a serious tendency for relapse⁽¹¹⁾.

Recently, dental implants, miniplates, and miniscrews have been used as anchorage units in orthodontic treatments. These techniques can supply the anchorage that is needed for specific dental movements, regardless of patient cooperation. Changes in dentofacial structures resulting from molar and buccal segment intrusion with miniplates placed in the zygoma have been shown in many studies and case reports, and successful molar intrusion and open bite treatments have been reported with miniscrews anchorage⁽¹²⁻¹³⁾.

In this study for management of anterior open bite, temporary anchorage devices (TADs) will be use to intrude the maxillary posterior teeth to allow auto rotation of the mandible to close an anterior open bite

Aim of the study

The present study will be performed to:

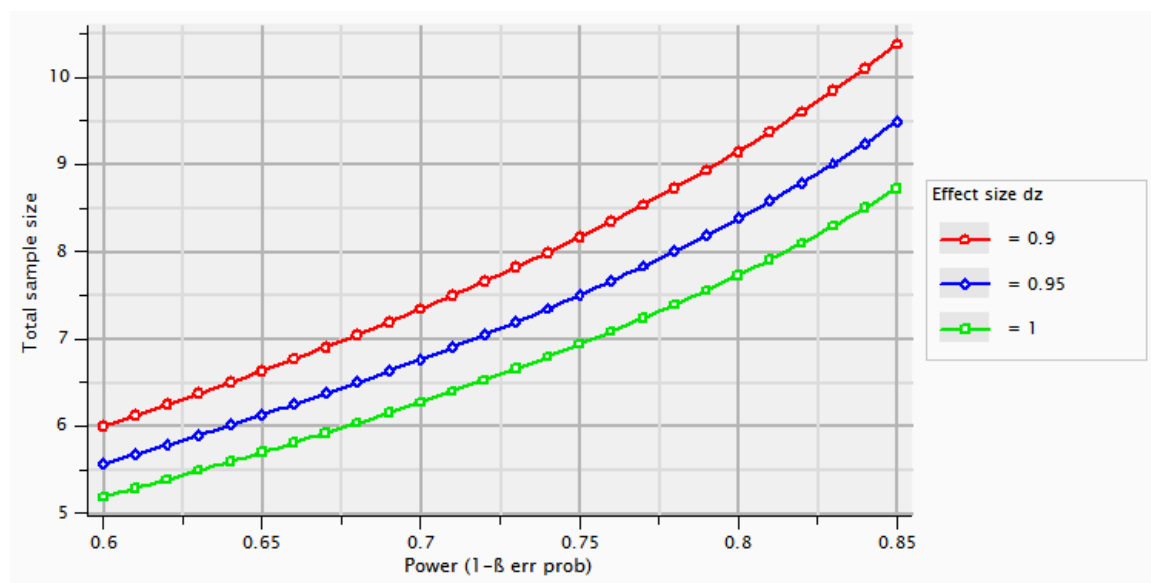
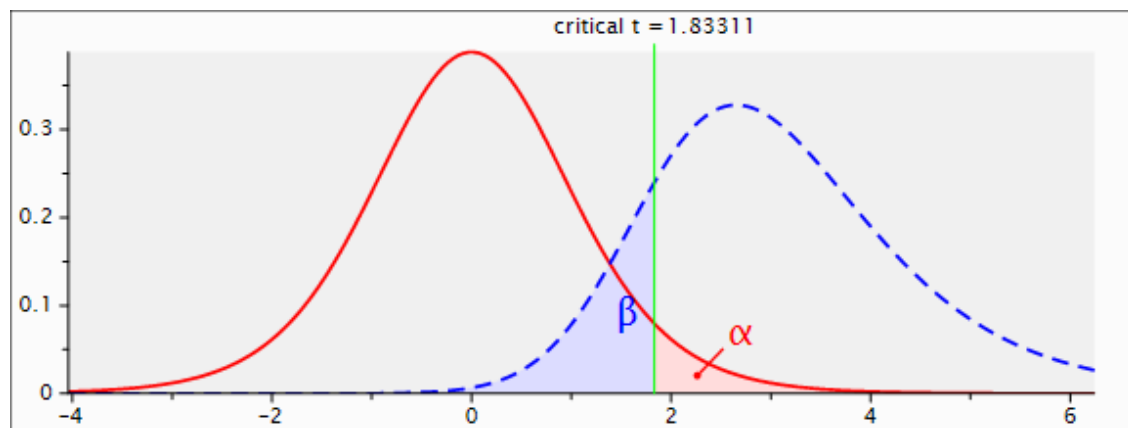
Evaluate the treatment outcome of anterior open bite by temporary anchorage device TADs (buccal and palatal miniscrows).

Subjects and Methods

Sample size calculation :

To assess the treatment outcome of anterior open bite through a temporary anchorage devices TADs , paired t-test to will be used. A minimum total sample size of 10 participants will be sufficient to detect the effect size of 0.9 a power ($1-\beta=0.80$) of 80% at a significance probability level of $p<0.05$. The sample size was calculated according to G*Power software version 3.1.9.3.

Figure1. Paired T-test- total sample size calculations



The sample of open bite patients will be taken from the Orthodontic Clinic Faculty of Dental Medicine for Girls, Al-Azhar University.

The steps of the procedure will be explained to the patients / parents and an informed consent will be signed.

Inclusion criteria:⁽¹⁴⁾

1. Patients age range 13-18 years old.
2. Patients have anterior open bite.
3. Normal healthy patient.
4. Patient have healthy oral tissues.
5. Patient have class I or II jaw relationship.
6. Patient have complete set of permanent teeth except the wisdom tooth.

Exclusion criteria :⁽¹⁵⁾

1. Uncooperative patient and parents.
2. patient who had undergo previous orthodontic treatment.
3. Patient with class III jaw relationship.

Appliances:

Maxillary Temporary anchorage devices (TADs) and direct bounded attachment buccal and palatal on maxillary posterior teeth.

Methodology

- Open bite patient will be collected from Orthodontic Clinic, Treatment Center, Faculty of Dental Medicine, Girls, Al-Azhar University.

1) The following record will be taken for each patient before delivery appliance and after the appliance removal to detect amount closing of bite achieved:

- Panoramic and cephalometric X-ray :cephalometric analysis will do before and after treatment to detect :ANB Angel , anterior facial hight , posterior facial hight, upper incisor inclination , SN line ,FH line .
- Upper and lower orthodontic cast
- Extraoral and intraoral photograph

2) Treatment plan:

-eliminate causative habit by proper selected appliance.

- dental correction of the open bite problem:

- Correct the open bite by intrusion posterior teeth with temporary anchorage device, miniscrows on buccal and palatal side and intrusive force.
- Smile analysis will do after correction the open bite to evaluate effect of intrusion .

Statistical analysis:

Data will be collected and the amount closing of bite achieved will be tabulated and statistical analysis.

Ethical consideration:

The research protocol approved by ethical committee of Faculty of Dental Medicine, girls, Al-Azhar University, (P-OR-21-05). The steps of the procedure will be explained to the patients / parents and an informed consent will be signed.

References

1. **Bjork A, Skieller V.** facial development and tooth eruption. Am J Orthod Dentofac.2018;62: 339-83.
2. **Dockrell RB.** Classifying the etiology of malocclusion, Denral Record,2014;72: 25-31.
3. **Moyen RE.** Handbook of Orthodontics- 8th Edition. Year Book Medical Publishers Inc. 35 East Wacker Drive, Chicago.2012 Chapter III. 127.
4. **Nahoum HI, Horowitz SL, Benedicto EA .**Varieties of anterior open bite. Am J Orthod Dentofac orthop; 2011; 61: 486-92.
5. **Hapak FM.** Cephalometric appraisal of the open bite case. AnOrthodonti.2018;34: fl5 -72.
6. **Alexander CD.** Open bite, dental alveolar protrusion, Class I malocclusion: a successful treatment result. Am J Orthod Dentofacial orthop; 2012;116:494-500.
7. **Alcan T, Keles A, Erverdi N.** The effects of a modified protraction headgear on maxilla. Am J Orthod Dentofacial. Ortho p 2011;117: 27-38.
8. **Kim YH.** Anterior open bite and its treatment with multiloop edgewise archwire. Angle Orthod. 2012;57:290-21.

9. **Sassouni V , Nanda S.** Analysis of dentofacial vertical proportions. Am J Orthod Dentofac orthop; 2017;50: 801-23

10. **Scheffler NR, Proffit WR, Phillips C.** Outcomes and stability in patients with anterior open bite and long anterior face height treated with temporary anchorage devices and a maxillary intrusion splint. Am J Orthod Dentofacial orthop; 2014;146: 594-02.

11. **Deguchi T, Kurosaka H, Oikawa H, Kuroda S, Takahashi I, Yamashiro T, et al.** Comparison of orthodontic treatment outcomes in adults with skeletal open bite between conventional edgewise treatment and implant-anchored orthodontics. Am J Orthod Dentofacial orthop;2011;139(4 Suppl):S60-8.

12. **Cheng SJ, Tseng IY, Lee JJ, Kok SH.** A prospective study of the risk factors associated with failure of mini-implants used for orthodontic anchorage. Int J Oral Maxillofac Implants 2014;19: 100-6.

13. **Akan S, Kocaderelli I, Aktas A, Tasar F.** Effects of maxillary molar intrusion with zygomatic anchorage on the stomatognathic system in anterior open bite patients. Eur J ortho.2013;35:138-99.

14. **Erverdi N, Usumez S, Solak A.** New generation open-bite treatment with zygomatic anchorage Angle Orthod.2016;76:519-26

15. **Greenlee GM, Huang GJ, Chen SS, Chen J, Koepsell T, Hujoel P.** Stability of treatment for anterior open-bite malocclusion: a meta-analysis. Am J Orthod Dentofacial Orthop. 2011;139:154-69.

