Case Report

Anterior open bite treatment with Mini-implants: A Case Report

Surbhi Arora, Roshni Shetty, Roopak D Naik

Department of Orthodontics and Dentofacial Orthopedics, S. D. M. College of Dental Sciences and Hospital, Sattur, Dharwad – 580009 Karnataka.

Corresponding Author:
Dr. Surbhi Arora
H. No. Flat no- 404 B,
Anant Apartment,
Plot no- 25A, Sector 4, Dwarka,
New Delhi- 110078
E-mail id: surbhi.arora0@gmail.com

Received: 20-07-2013
Revised: 18-08-2013
Accepted: 27-08-2013

Abstract:
Open bite malocclusion is considered to be one of the most difficult problems to treat. The causes of the open bite are multifactorial, which can develop form genetic and or environmental factors. Reported here is a case of 22 year old female anterior dental open bite with crowding in the anterior segment. On clinical examination and analysis, the case was diagnosed to be Angle's Class I molar relationship with Class I canine relation, increased overjet of 4mm and negative overbite for 3mm. The patient was successfully treated using orthodontic mini-implants achieving a positive overbite. Our results suggest that orthodontic implants are useful for retraction of anteriors and maintenance of anchorage in anterior open-bite cases.

Keywords: Anterior open bite, Mini-implants, Hyperdivergent, Multifactorial

This article may be cited as: Arora S, Shetty R, Naik RD. Anterior open bite treatment with Mini-implants: A Case Report. J Adv Med Dent Scie 2013;1(2):155-158.

Introduction

Open bite malocclusion in adults is considered to be one of the most difficult problems to treat because of its complicated etiology[1]. The etiology of the open bite is multifactorial: genetic and/or environmental factors. The factors ranging from vertical maxillary excess, abnormalities in dental eruption, open bite skeletal pattern and tongue posture problems[2] contributes to this condition making it a challenge for an orthodontist. Open bite is generally classified in two categories: skeletal and dental. Further anterior open bite can range from simple; limited to anteriors to complex extending into the premolar and molar region.

The diagnosis of open bite is the key to success of the treatment with specific criteria both in clinical and cephalometric perspectives. The lack of further growth potential restricts our ability to correct by camouflage or orthognathic surgery, unlike adolescents. Each case presents with variety of treatment options, ranging from observation or simple habit control to complex surgical procedures. Therefore, the success and stability of the treatment depends on the presentation of each individual after thorough assessment. Orthodontic mini-implants have overcome the limitations of camouflage orthodontic treatment, especially in cases requiring

surgery. They have been used to provide anchorage for various types of tooth movements, including intrusion, retraction, protraction of the posterior teeth and molar uprighting. Cases with critical anchorage, as in anterior open bite complicated with tongue thrust implants can ease the treatment. Here, we are presenting a case of anterior open bite in an adult and its management using mini-implants.

Case Report

A 22 year old female presented to us with chief complaint of space in front teeth and difficulty in speaking. She had no relevant medical history or previous orthodontic treatment. On evaluation of the history and clinical examination of the patient, a diagnosis of anterior open bite was made. The open bite was due to tongue thrusting habit which leads to increased proclination of the anteriors and localized open bite (Figure 1). On extra-oral examination, patient presented with increased lower anterior facial height, hyperdivergent growth pattern and incompetent lips (Figure 2). Intraoral examination showed Class I molar and canine relation, with localized anterior open bite of 3mm and crowding in the upper and lower anteriors. The panoramic radiograph showed all erupted third molar with no other abnormal finding (Figure 3). The cepahalometric analysis revealed skeletal sagittal Class II, vertical hyperdivergent growth pattern with proclined upper and lower incisors. Lower facial height and mandibular plane angle are increased due to clockwise rotation of the mandible.

Figure 1: Pretreatment intraoral photographs

Figure 2: Pretreatment Extra-oral photograph

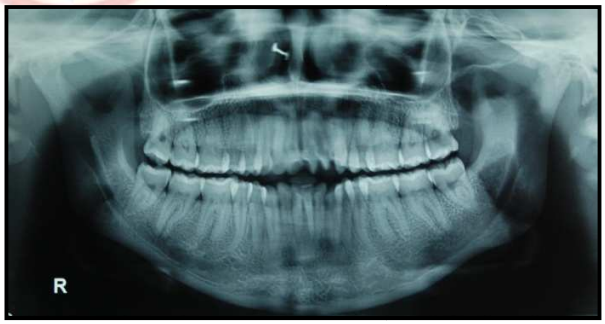

Figure 3: Pretreatment panoramic radiograph

Treatment objectives were to achieve positive overbite and ideal overjet with well aligned upper and lower anteriors and a pleasing profile. The etiology of the open bite was simple tongue thrust habit, therefore skeletal rotation of jaw bases was ruled out as the cause. The treatment plan involved an orthodontic camouflage line of treatment, with need to extract all first premolars to provide space for correction of

crowding and the proclination of the anteriors; achieving a positive overbite. The clinical examination supported by cephalometric findings, suggested a critical anchorage case, with the need to maintain Class I molar relationship while retraction and aligning the anteriors. To achieve ideal results orthodontic mini-implants were placed between the second premolar and first molar (Figure 4). Considering patient's negative overbite, the implants were anchored lower in the buccal cortical bone. In treatment protocol 0.022 X 0.028" MBT brackets were used for both the arches. Following extraction of first premolars (14,24,34 and 44), leveling and aligning was done on 0.16" NiTi, 0.018" S.S and the spaces were closed using implants on 0.019" X 0.025" S.S with reverse curve of spee. Keeping in mind the cause of open bite, tongue exercises were taught to the patient. For retention, upper and lower removable wrap around retainer was advised, with a hole made in the palatal aspect of upper retainer to act as a reminder for the tongue thrusting habit.

Figure 4: Intraoral photograph with mini-implants for retraction of anteriors.

Results: Angle's Class I molar relation and canine relation was attained, with ideal an overjet and positive overbite (Figure 5). The patients profile improved with notably better speaking abilities.

Figure 5: Post-treatment intraoral photograph

Discussion

Anterior open bite is one of the most common malocclusions seen. Its multifactorial etiology and instability highlights its importance for correct diagnosis and treatment planning. The case presented here with anterior open bite due to tongue thrust, can be classified into dental open bite. However, skeletal open bite presents with open bite extending into the molar region clinically and is due to the downwards rotation of the mandible.[2] Successful treatment of the adult patient with dental or skeletal open bite pattern often presents as a difficult challenge. Dental compensation, such as uprighting the posterior teeth, and uprighting and extruding the anterior teeth, obtainable from multiloop edgewise archwires[3] can be optional for borderline patients and those who are reluctant to undergo surgery. However,

intermaxillary elastics, used in conventional and multiloop edgewise archwire mechanics, usually cause extrusion of the posterior teeth[4]; this opens the mandibular plane and has detrimental effects on the facial profile. Therefore, vertical control of the posterior teeth is crucial in the orthodontic treatment of open bite.[5] To obtain an absolute anchorage, dental implants[7], screws[8] and miniplates[9] have been used in orthodontics. Mini- implants have been used to provide anchorage for various types of tooth movements, including intrusion of the anterior and posterior teeth, retraction of the anterior teeth and the whole dentition, protraction of the posterior teeth, and molar uprighting. Their absolute anchorage, small size, and simple and less invasive surgical procedure could increase their clinical use.[10] Microscrew implants, placed between the second premolars and the first molars in the maxillary arch[6], can provide anchorage for anterior retraction and posterior intrusion of the teeth. Kim[3] stressed the importance of correcting the cants of the occlusal planes and uprighitng the posterior teeth against the occlusal plane in managing open bite mesial tipping of the posterior teeth can easily occur with premolar extractions. Therefore, implants should be used to control the posterior teeth vertically and to retract the anterior teeth.

Conclusion

Negative overbite, either dental or skeletal requires thorough diagnosis and treatment planning. In adults the lack of growth limits our treatment approach further. In conclusion, for adults with dental open bite, orthodontic camouflage assisted with mini-implants are successful for efficient retraction of anteriors. Especially in critical anchorage cases, with the habit of tongue thrust further taxing the anchorage the mini-implants are efficient and successful.

Source of support: Nil

References

1. Speidel T.M, Issacson R.J, Worms F.W. Tongue thrust therapy and anterior dental open bite. Am J Orthod 1972;62:287-95.
2. Sarver D.M and Wiesmann S.M. Non-surgical treatment of open bite in non-growing patients. Am J Orthod 1995;108:651-9.
3. Kim Y.H. Anterior open bite and its treatment with multiloop edgewise archwire. Angle Orthod 1987;57:290-321.
4. Yamaguchi K, Nanda R.S. The effect of extraction and non extraction treatment on mandibular position. Am J Orthod 1991;100:443-52.
5. Klontz H.A. Facial balance and harmony an attainable objective for the patient with high mandibular plane angle. Am J Orthod 1998;114:176-88.
6. Park H.S, Kwon T.G and Kwon O.K. Treatment of open bite with microscrew implant anchorage. Am J Orthod 2004;126:627-36.
7. Turley PK, Kean C, Schur J, Stefanac J, Gray J, Hennes J, Poon LC. Orthodontic force application to titanium endosseous implants. Angle Orthod. 1988;58:151–162.
8. Creekmore TD, Eklund MK. The possibility of skeletal anchorage. J Clin Orthod. 1983;17:266–269.
9. Jenner JD, Fitzpatrick BN. Skeletal anchorage utilizing bone plates. Aust Orthod J. 1985;9:231–233.
10. Kuroda S, Katayama A, Yamamoto T.T. Severe Anterior Open-Bite Case Treated Using Titanium Screw Anchorage. Angle Orthod 2004;74:558-567.

Acknowledgement: Author would like to thanks Dr. Anand K Patil, Dr. Sanjay V. Ganeshkar and Dr. Sangamesh for their guidance and support.

Conflict of interest: None declared