



Correction Of Deep Overbite By True Intrusion With Mini Screw Implant : A Case Report

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Abstract

Deep overbite correction during orthodontic treatment is often difficult and shows considerable relapse rate. The action of the orthodontic appliance in deepbite correction is based on an extrusion of molars, an intrusion of incisors, or by a combination of both. The choice varies according to patient's age, growth pattern and esthetic demand. Mini-screw implants or TADs are a compliance free alternative to more traditional forms of incisor intrusion like intrusion arches. Upper incisor intrusion and overbite correction is better in patients treated with two miniscrews. Deepbite gets corrected without rotation of the mandibular plane and stability is satisfactory. In this case report a 17 years old girl with severe crowding and complete deep bite was treated using therapeutic extraction and miniscrew implant. Considering the growth status and incisal visibility mini implant was chosen for deepbite correction that yielded satisfactory result.

Keywords: Mini screw implant , Deep overbite, True intrusion.

Introduction

A Strang defined overbite as the overlapping of the upper anterior teeth over the lowers in the vertical plane [1]. Excessive overbite or deepbite is one of the most commonly occurring malocclusion and also one of the most difficult to treat [2]. There are multiple factors contributing to the development of deep bite like incisor supraeruption, molar infraocclusion, increased overjet, incisor shape and angulation, lack of natural bite opening, ramal height, vertical facial dimension etc [3]. Correction is based on extrusion of molars, intrusion

of incisors, or by a combination of both [4]. Traditionally reverse curve in continuous wire or segmented arch techniques in the form of utility arches [5] are used for bite correction.

Recently, the use of temporary anchorage devices (TAD), which are stainless steel or an alloy of titanium placed into the buccal or palatal alveolar bone, has been popular for intrusion of teeth and there are many reports support that TAD is superior than other orthodontic methods [6]. They are smaller than regular dental implants and have the advantages of reducing patient compliance, immediate loading, uncomplicated placement, and minimal expense for patients [4]. In this case report a 17 years old girl with severe crowding and deep traumatic bite was treated using therapeutic extraction and mini implant.

Case Report

A 17 year old female patient reported with a chief complaint of irregularly placed upper and lower front teeth and unpleasant smile.

Figure 1: Pretreatment extraoral and intraoral photographs

Extraoral examination revealed convex facial profile with a mesoprosopic facial type. Lips were incompetent with an inter-labial distance of 5 mm. Lip trap was present with deep mentolabial sulcus. Face was apparently symmetrical. She had no pain or crepitus on temporo-mandibular joint examination. [Figure1]

Intraoral examination revealed the presence of all erupted permanent teeth except third molars. Crowding in upper and lower arch was present and 11,12,21, 22 and 35 were mesio lingually rotated. 14 and 24 were in scissors bite. Bilateral class I molar relationship was present. There were 5 mm of overjet and complete deep over bite [Figure1]. The upper dental midline was coinciding with the facial midline. Cephalometric analysis revealed slight vertical growth pattern, proclined upper and lower incisors and protrusive upper and lower lips [Table 1].

Problem List

Skeletal problems:

Growth pattern towards vertical

Dental problems:

1. Proclined upper and lower anteriors
2. Crowding in upper and lower anterior region
3. Mesiolingual rotation in 11,12,21,22 and 35
4. 14 and 24 were in scissors bite

Soft tissue problem:

1. Protrusive upper and lower lips
2. Incompetent lip
3. Inter labial gap - 5mm
4. Lip trap present

Treatment Objectives

1. To correct the inclination and align the proclined upper and lower anteriors in the basal bone
2. To correct the deep overbite
3. To attain normal overjet
4. To attain lip competency
5. To improve the smile and aesthetics and overall appearance

Treatment Plan

Patient was treated after extraction of all first premolars. She was treated using MBT 0.022 slot brackets using continuous arch mechanics. After flattening of curve of spee, the bite was still deep and incisal visibility was more. So two mini implants of 1.5X6 mm size were used distal to maxillary lateral incisors for intrusion of upper anteriors. At the end of the treatment, fixed bonded lingual retainer was given in upper and lower arch. To prevent relapse of deep bite, removable anterior bite plane was also given.

Treatment Progress:

Both arches were bonded and levelling and alignment was done with sequential nickel-titanium wires after extraction of 14,24,34,44. TPA and lingual arch were used for anchorage preservation. Even after levelling of curve of Spee in the lower arch it was found that the bite was still deep and patient was complaining about the increased incisal show. Considering the age

and growth pattern further addition of reverse curve was avoided and intrusion of the upper anteriors were planned. 2 miniscrew implants of 1.5x6 mm size were inserted in the maxillary arch distal to lateral incisors under local anaesthesia. A loading force of about 90 g [7] on a 0.019x0.025-in stainless steel archwire was used for absolute intrusion. [Figure 2].

Figure 2- TADs in place for anterior intrusion



Treatment Result:

Class I molar and canine relationships with normal overjet and overbite is achieved. Proclination of upper and lower teeth are corrected [Table 1]. Overall, facial appearance is enhanced with an improvement in the nose-lip-chin relationship and maxillary incisor display on smiling. [Figure 3].

Figure 3: Post Treatment Extraoral and Intraoral photographs

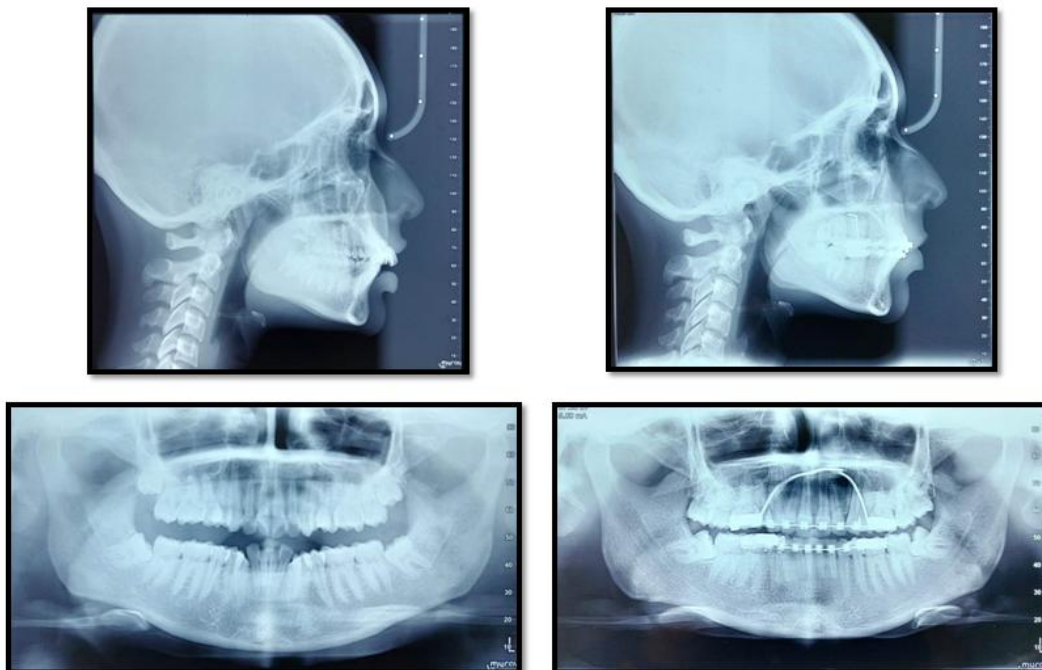


Table 1: Comparison between pre and end stage treatment values

Cephalometric	PRE	POST
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values		
SNA	80.5 ⁰	80.5 ⁰
SNB	78.5 ⁰	79 ⁰
ANB	2 ⁰	1.5 ⁰
WITS	-1mm	0 mm
UI-NA	10 mm/38 ⁰	5mm/28 ⁰
UI-SN	118 ⁰	106 ⁰
L1-NB	6.5mm/29 ⁰	4.5mm/26 ⁰
IMPA(Degree)	100 ⁰	96 ⁰
FMA	29 ⁰	29.5 ⁰
Y-Axis	63 ⁰	63.5 ⁰
Facial axis angle	-5 ⁰	-4 ⁰
Nasolabial Angle	95 ⁰	102 ⁰
E line	U= -1mm L=+1mm	U= -3mm L=0mm

Figure 4: Pre and End treatment radiographs



Discussion

The maxillary incisor position, especially with the upper lip, is a key factor in determining the choice of treatment of deep bite, maxillary incisor intrusion in patients with insufficient incisor display may lead to

flattening of the smile arc and compromised smile esthetics [4]. Mini-screw implants have been successfully used for intruding teeth because they make it possible to apply light continuous forces of known magnitudes. Better control of the forces could

decrease external apical root resorption, which is often associated with intrusive movements [4]. One or two miniscrews can be used between central incisors, central and lateral incisors, or lateral incisors and canines [4,7], but placing them between lateral incisors and canines provides intrusion with minimal incisor protrusion because of position of CR of six anteriors [7]. Other methods, most of which use posterior teeth for anchorage, may produce unwanted reciprocal effects. Comparing intrusion archwires with miniscrews, some authors have reported significantly more incisor intrusion with less proclination when using miniscrews [4,6]. Another beneficial effect is that the mandibular plane angle does not alter as in case with reverse curves, which is often desirable in late teens or adults with lack of ramal remodelling. This prevents unnecessary opening of mandibular plane angle and reduces chance of relapse [8].

Conclusion:

Effective correction of deep bite is possible by using of two miniscrew implants with minimum incisor proclination and apical root resorption. True intrusion of maxillary anteriors were produced without relying on patient cooperation and without any complications. The end result produced proper smile esthetics satisfactory to the patient.

Conflict of interest :There are no conflicts of interest.

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