Case Report
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Self Drilling Implant Assisted Unilateral Maxillary Molar Distalization

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Abstract

Self drilling implants are the temporary anchorage devices (TADs) that have proved over the time to be effective in contemporary practice for distalization of molars while conserving anterior anchorage. This case report describes the use of self drilling miniscrew implant (1.5×8mm Classic Orthodontics) in a patient with Class II subdivision right malocclusion. Right Maxillary first molar was distalised after extraction of second molar to dissipate crowding and and align canine in the dental arch of ipsilateral side with fixed orthodontic mechanotherapy. Class I canine and molar relation was achieved while maintaining inclination of maxillary anterior teeth.

Keywords: Molar Distalization, TADs

1. Introduction

Self-drilling implant (SDI) is one of the simplest, effective, patient friendly and a nonsurgical variant of TADs in Contemporary Orthodontics for effective distalization of teeth with the aim of maximum anchorage conservation. In this paper, a self-drilling implant (SDI) was used in a patient indicated for unilateral maxillary molar distalization in order to create space for a labially placed canine. Maxillary molar distalization by intraoral technique is recommended for patients with minimal compliance[1,2]. Conventionally, distalization of the molars cause proclination of anteriors which need retraction against the distalized molars later on. This (Newton's third law) leads to undesirable anchorage loss (mesialisation of distalized molars) resulting into poor treatment results. Moreover, the treatment time is also prolonged. Therefore, there is a need of skeletal anchorage which can overcome these side effects.

TAD is inserted in cortical bone for better orthodontic anchorage directly or indirectly. TAD is a contemporary means of conserving anchorage which is a functional concept in treatment planning in Orthodontics[3,4].

Implants can be divided into two types according to the mode of insertion, 1. Self tapping – pilot hole in the cortical bone equal to implant length is necessary for inserting an implant having a non-cutting tip. Diameter of the pilot hole is kept slightly smaller than that of implant so as to get mechanical retention owing to elasticity of the bone and 2. Self drilling – have a cork screw type of cutting tip which may or may not require pilot hole depending upon the thickness and quality of the cortical bone. These implants have their own pros and cons. Self-tapping method is slightly more invasive since they always require drilling a pilot hole. A SDI requires high pressure during placement in cortical bone. The side effects of SDI may be excessive pressure on the bone, discomfort to the patient and bone loss leading to failure of the implant. Orthodontist might also lose desired tactile sensation of implant and placement in undesired direction leading to complications like injury to the patient, fracture of the implant or it may be lost in the any of the spaces. But in case of self-tapping system, these complications are minimized since implant direction is guided by the pilot hole. Implants are available in various lengths from 4-12

mm. The length of an implant selected should be as long as possible without jeopardizing the vital structures.

2. Case Report

A 14-year-old boy reported to the department with a chief complaint of high placed corner tooth of upper jaw. Its ectopic position in this region and affected his esthetic appearance made him difficult to maintain his oral hygiene in that area. Extra oral examination revealed upper dental midline shift to right side by 2 mm with respect to facial midline. Intra oral examination revealed high and labially placed 13. He had Angle's Class II div 1 subdivision (right side) malocclusion (Figure 1). OPG revealed acceptable anatomy and eruption pattern of 18 tooth germ (Figure 1).

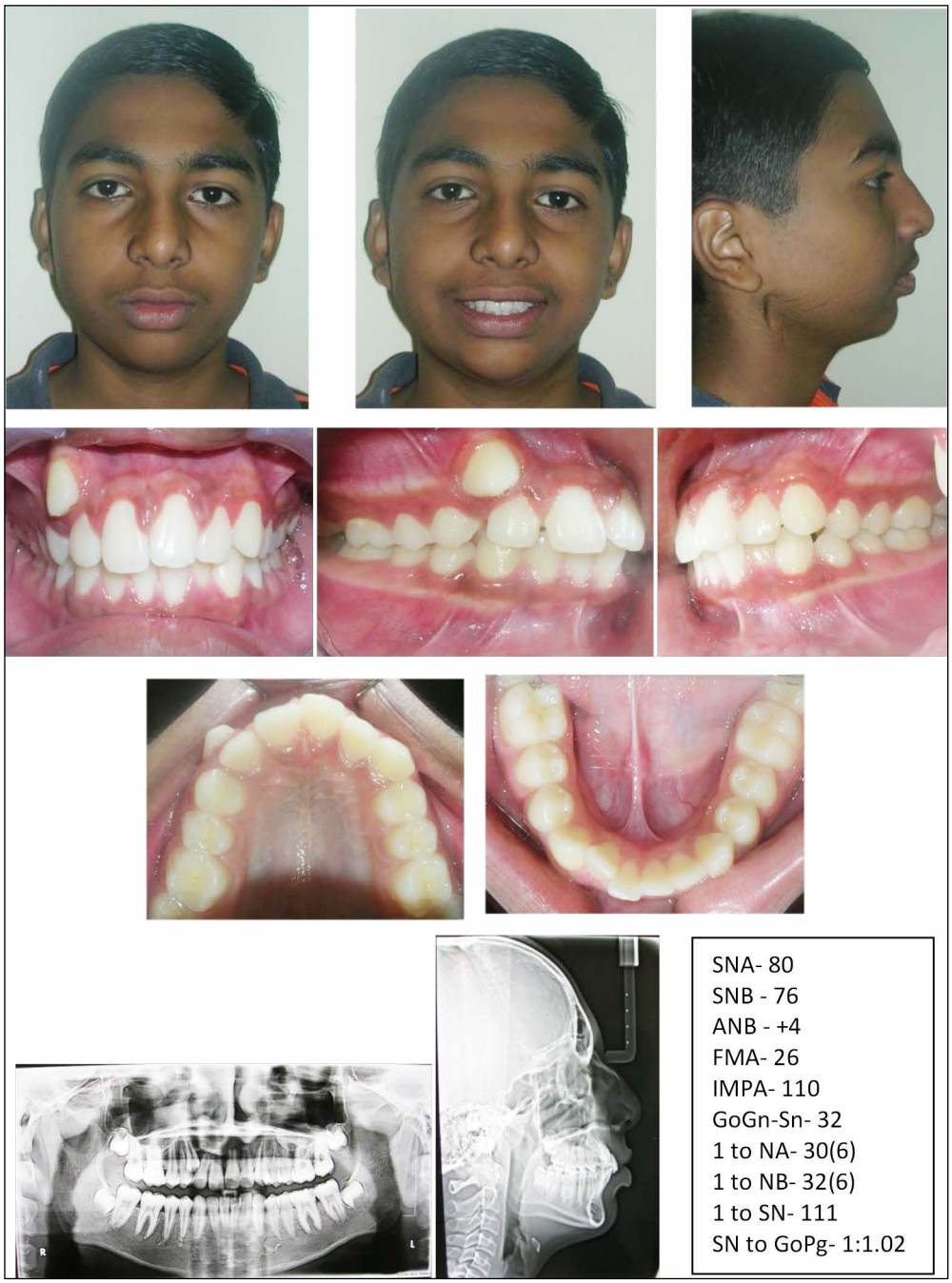


Figure 1. Pre-treatment photographs, OPG and Lateral Cephalogram.

2.1 Problem List

- Upper arch crowding.
- Labially placed 13.
- Space loss in the region of 13.
- Upper dental midline shift to right by 2 mm.
- Molar relation – Class II (R) and Class I (L).
- Average growth pattern.

2.2 Treatment Objectives

- To maintain the profile of the patient during treatment.
- Alignment and levelling.
- To correct midline discrepancy.
- To correct molar and canine relationship.

2.3 Treatment Plan

- Therapeutic extraction of 17.
- Distalization of 14, 15 and 16 with the help of an SDI.
- Fixed mechanotherapy – Preadjusted Edgewise Appliance Roth 0.018" inch.

2.4 Treatment Progress

A Nance button was soldered to 14 and 26 to maintain the occlusion of the left side. Extraction of 17 followed by engaging a SDI of 1.5 mm × 8 mm in 17 region. 018" inch slot Roth prescription brackets were bonded except on 13, 14 and 16 was banded. An e-chain was engaged from implant to 14 to provide indirect anchorage for distalization (Figure 2). Alignment and levelling was initiated in the maxillary arch with 0.014" HANT Niti followed by 0.016" super elastic Niti, 0.016" × 0.022" superelastic Niti, 0.016" SS and 0.016" × 0.022" SS arch wire (working archwire). A Niti open coil spring was engaged between 14 and 16 for distalization of 16 followed by distalization of 15 and 14 with the help of SDI once the Nance button was removed. After sufficient distalization of 16, 13 and 15 were bonded and 13 was engaged by piggy back 0.016" super elastic Niti once the space was created (Figure 2). Lower arch was also bonded for levelling and alignment. Class I molar with 13 in place was achieved in the end as planned (Figure 3) 18 also took the position of 17 later on. Begg's retainers were fitted after debonding. Midline correction was also achieved without changing the profile of the patient. Superimposition of pre and post-treatment lateral cephalogram shows a distalization and distal tilting of 16 by 5mm and 3 degrees respectively

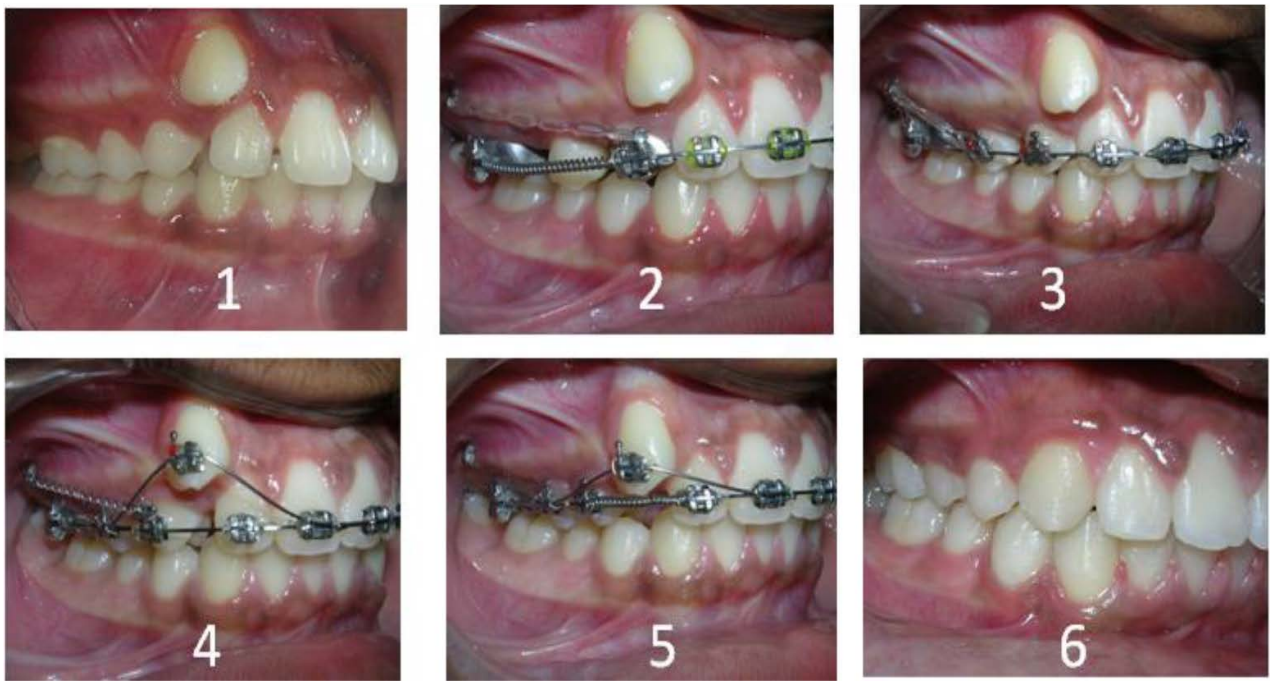


Figure 2. Distalization of molar with open coil spring between tooth 16 and 14 reinforced by indirect anchorage from miniscrew implant; space created for alignment of canine; further midline correction with open coil spring in between 12 and 14.

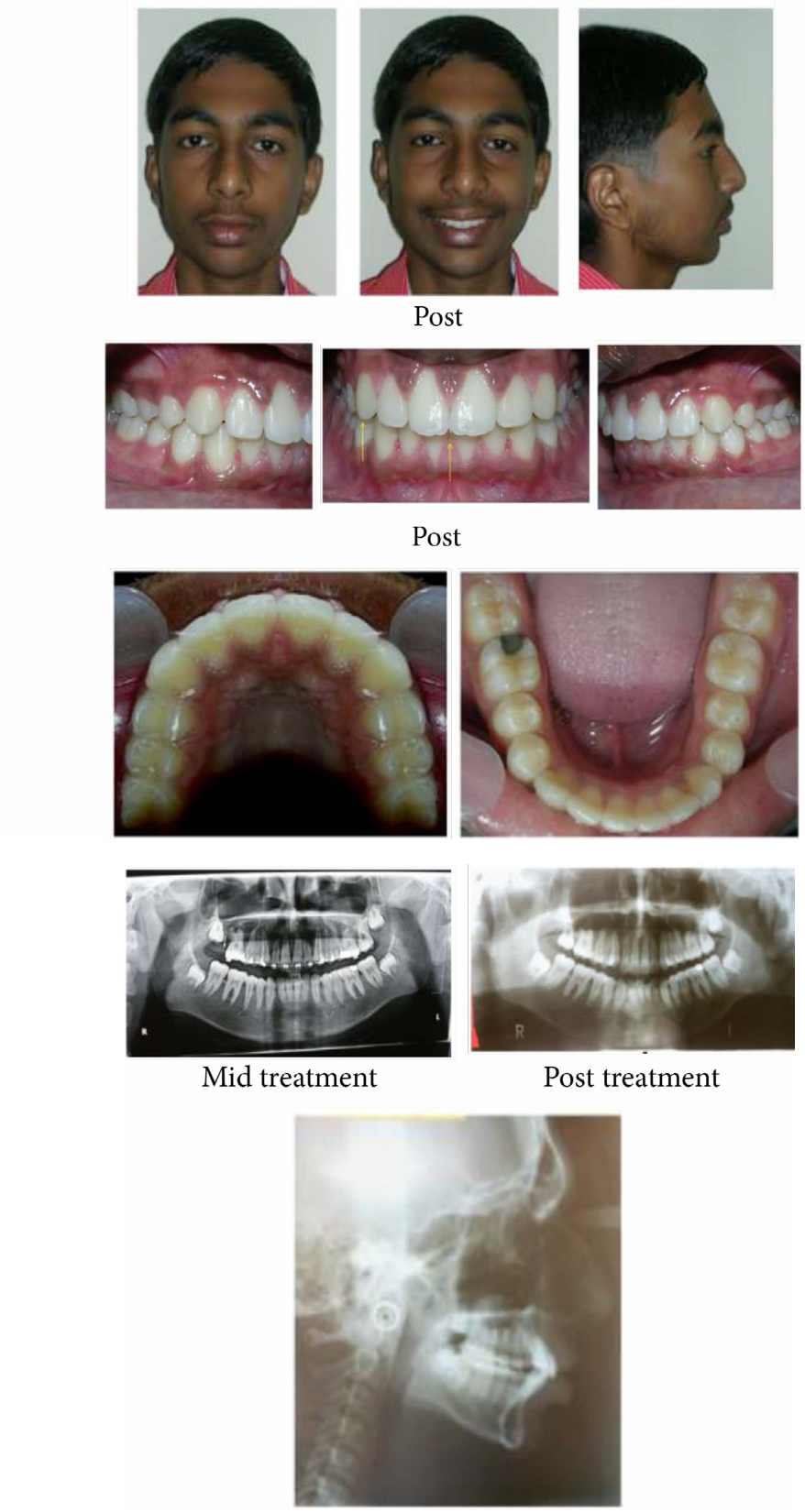


Figure 3. Post-treatment photographs, OPG and Lateral Cephalogram.

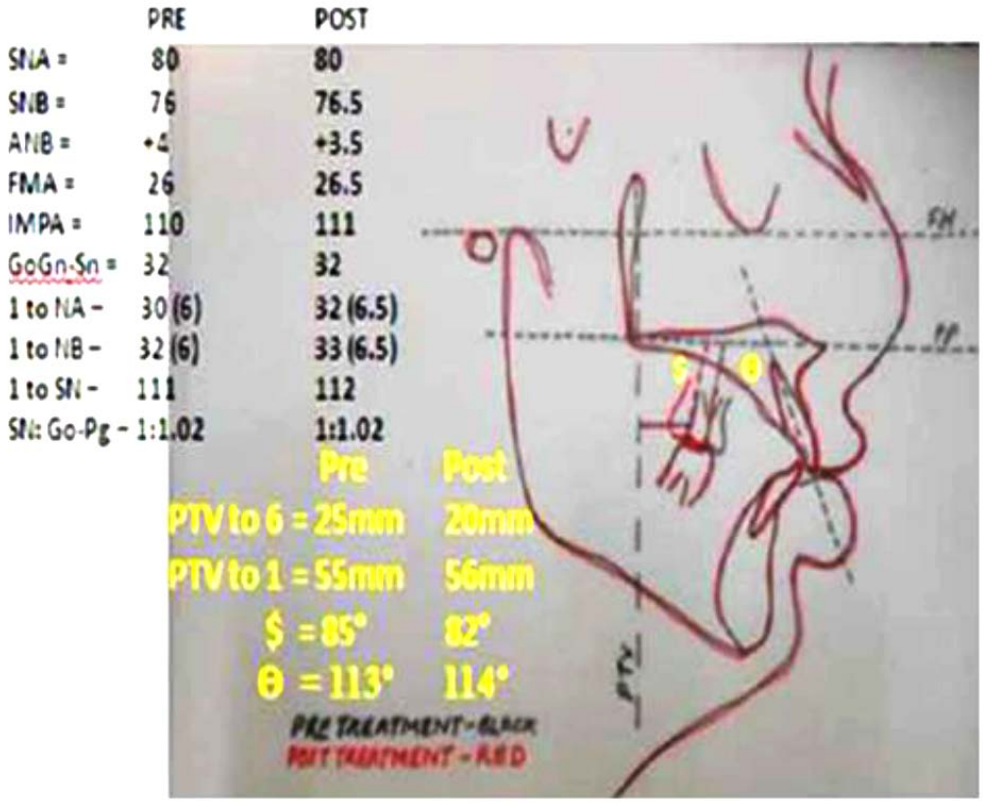


Figure 4. Superimposition of pre-treatment and post-treatment lateral cephalogram.

with only 1 mm proclination of maxillary incisors (Figure 4).

3. Discussion

In this case, Class II Subdivision (Right side) with labially placed 13, 16 was distalized after extraction of 17 with the help of an SDI to achieve bilaterally symmetrical occlusion. Later on, 18 took the position of 17 in a good occlusion. Midlines were matching with Class I occlusion on both the sides. Antonarakis and Kiliaridis[5] observed that tooth-supported maxillary molar distalization moved maxillary molars by 2.9 mm; but incisors moved mesially by 1.8 mm. The presented case showed that TADs improved molar distalization with excellent control on anchorage loss. Previous studies[6–8] have showed maxillary molar distalization to be in the range of 3.9 to 6.4 mm. In our case, the molar distalization was 5 mm with excellent control on anchorage loss of maxillary incisors. That shows TAD reinforced distalization is better than tooth supported distalization.

4. References

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