

## Implant Supported Mandibular Protraction Applianceiv: A Case Report

Dr. Abhilasha Choudhary<sup>1</sup>, Dr. Abhishek Choudhary<sup>2</sup>, Dr. Vikas Gill<sup>3</sup>,  
Dr. Chiranjeev Saini<sup>4</sup>, Dr. Mohammed Hussain Qureshi<sup>5</sup>

<sup>1</sup>(Department of orthodontics & Dentofacial orthopaedics, Rajasthan Dental Collage & Hospital, India)

<sup>2</sup>(Department of oral & maxillofacial surgery, Rajasthan Dental Collage & Hospital, India)

<sup>3</sup>(Department of orthodontics & Dentofacial orthopaedics, Rajasthan Dental Collage & Hospital, India)

<sup>4</sup>(Department of orthodontics & Dentofacial orthopaedics, Rajasthan Dental Collage & Hospital, India)

<sup>5</sup>(Department of orthodontics & Dentofacial orthopaedics, Rajasthan Dental Collage & Hospital, India)

---

**Abstract :** Fixed functional appliance are used for the correction of skeletal class II discrepancy in residual growth period. Fixed functional appliances have unfavourable effect of flaring of the mandibular anterior, which limits the skeletal effects of the fixed functional appliance and additionally it requires alignment of both arches which increases treatment time. To overcome such effects mini implant supported mandibular protraction appliance IV was inserted in a patient which improved skeletal base relation without flaring of anterior teeth and reduced treatment time as mandibular dentition was treated separately without the hindrance of fixed functional appliance. Mandibular protraction appliance IV is easier to construct and insert, comfortable and economical to the patient.

**Keywords:** Mandibular protraction appliance IV, Fixed functional, class II discrepancy, Implants, TADs

---

### I. Introduction

Several removable or fixed functional appliances are used for treatment of class II division 1 malocclusions with mandibular deficiency in order to stimulate mandibular growth by forward positioning of the mandible. Unlike removable functional appliances, fixed functional devices have the advantage of not requiring patient compliance, and they can also be used concurrently with brackets.<sup>1</sup>

Fixed functional devices are categorized as rigid (Herbs, Mara, mandibular protraction appliance) and semi rigid (Jasper jumper and for SUS fatigue resistance device [FRD]) fixed interarch appliances.<sup>2-4</sup> The mandibular protraction appliance is a recently developed noncompliant rigid fixed functional appliance that holds the mandible anteriorly and corrects the class II antero-posterior discrepancy.<sup>5-8</sup> The mandibular protraction appliance IV is the latest version of a mandibular protraction appliance and has many advantages over its three previous versions and also over other fixed functional appliances because it is much easier to construct and install, and much more comfortable for the patient.<sup>8</sup>

Data from the literature demonstrates the increasing use and popularity of miniscrews in orthodontic practice for mesiodistal and intrusion movements of teeth.<sup>9</sup> However, there are no studies where miniscrews have been used with mandibular protraction appliance IV.

Like other fixed functional appliances, an unfavorable effect of the mandibular protraction appliance IV is flaring of the mandibular anteriors, which limits the skeletal effects of the appliance.<sup>10</sup>

Therefore, we concluded that during the usage of a mandibular protraction appliance IV, mandibular growth could be stimulated and tipping of mandibular incisors could be avoided by increasing the anchorage of mandibular dentition with the use of miniscrews.

### II. Material & Methods

MANDIBULAR PROTRACTION APPLIANCE IV has been used as a mandibular protraction appliance. It has been modified to be used along with the miniscrew implant. Miniscrew Implant which is used for the anchorage is obtained from Lion™ with a diameter of 1.8mm and length of 8mm and a hole of .036”

#### PLACEMENT OF APPLIANCE

Miniscrew Implants were placed between first and second premolar roots bilaterally, and left for one month before loading of MANDIBULAR PROTRACTION APPLIANCE IV.

MANDIBULAR PROTRACTION APPLIANCE IV is fabricated & modified by placing a stop just before the miniscrew hole to prevent any slippage of the rod from screw. At the other end the mandibular rod is cinched by bending. Composite is placed on the cinched end to prevent any tissue irritation.

**FIGURE NO: 1** (Modified MANDIBULAR PROTRACTION APPLIANCE IV with distal stop on the mandibular rod just before the hole of mini Implant)

**FIGURE NO: 2** (placement of implant between first & second premolar & insertion of the Appliance.

**CASE REPORT-**

A 12-year-old male presented with a Class II, division 2 malocclusion on skeletal class II base with retrognathic maxilla and retrognathic mandible, having average growth pattern ,retrolined upper incisors & normal lower incisors.

Patient was treated without extractions, using the Implant supported MANDIBULAR PROTRACTION APPLIANCE IV to prevent proclination of lower anteriors and reduce the treatment time.

**FIGURE NO: 3**( 12- year old Male patient with class II div 2 Malocclusion before Treatment)

**III. Figures and Tables**



**Table No: 1 Pre-Treatment & And Post-Treatment Cephalometric Readings**

s.no	Parameters	Pre treatment	Post treatment
1.	SNA	77	77
2.	SNB	71	75
3.	ANB	6	2
4.	Mandibular plane angle GO-GN to SN	31	33
5.	Lower incisors to NB	4MM, 25	5MM,27
6.	IMPA	95	96
7.	Wits	5	1mm

**IV. Results**

After 14 months of treatment we have achieved Skeletal class 1 base ,class 1 molar and class 1 canine without much proclination of lower anterior segment

**FIGURE NO: 4** (Patient after 14 months of treatment)

## V. Conclusion

Use of Implant supported Mandibular Protraction Appliance IV was effective in minimizing labial tipping of mandibular incisors & reduction of treatment time but miniscrews should stay stable during treatment. It is also economical and comfortable to the patient than the other fixed functional appliance

## REFERENCES

- [1] O'Brien K, Wright J, Conboy F, et al. Effectiveness of treatment for Class II malocclusion with the Herbst or Twinblock appliances: a randomized, controlled trial. *Am J OrthodDentofacialOrthop.* 2003;124:128–137.
- [2] Ruf S, Pancherz H. Herbst/multibracket appliance treatment of Class II Division 1 malocclusions in early and late adulthood. A prospective cephalometric study of consecutively treated subjects. *Eur J Orthod.* 2006;28:352–360
- [3] Pangrazio-Kulbersh V, Berger JL, Chermak DS, Kaczynski R, Simon ES, Haerian A. Treatment effects of the mandibular anterior repositioning appliance on patients with Class II malocclusion. *Am J OrthodDentofacialOrthop.* 2003;123:286–295
- [4] Karacay S, Akın E, Olmez H, Gurton AU, Sagdic D. ForsusNitinol Flat Spring and Jasper Jumper corrections of Class II division1 malocclusions. *Angle Orthod.* 2006;76:666–672.
- [5] Coelho Filho CM. Mandibular protraction appliances for Class II treatment. *J ClinOrthod.* 1995;29:319–336.
- [6] Coelho Filho CM. Clinical applications of the mandibular protraction appliance. *J ClinOrthod.* 1997;31:92–102
- [7] Coelho Filho CM. The mandibular protraction appliance no. 3. *J ClinOrthod.* 1998;32:379–384.
- [8] Coelho Filho CM. Mandibular protraction appliance IV. *J Clin Orthod.* 2001;35:18–24.
- [9] Janssen KI, Raghoebar GM, Vissink A, Sandham A. Skeletal anchorage in orthodontics—a review of various systems in animal and human studies. *Int J Oral Maxillofac Implants.* 2008;23:75–88.
- [10] Ashok Kumar Jena;RituDuggal Treatment Effects of Twin-Block and Mandibular Protraction Appliance-IV in the Correction of Class II Malocclusion *Angle Orthodontist, Vol 80, No 3, 2010.*