

Nawaporn Ritwiroon, Boonsiva Suzuki, Eduardo Yugo Suzuki
Department of Orthodontics, Faculty of Dentistry, Bangkokthonburi University, Thailand

Introduction

Anchorage control is a key of success in orthodontic treatment especially in the bimaxillary protrusion cases. Typically, to improve severe protrusion of anterior teeth and improve facial profile, extraction of the first premolar is an appropriate treatment plan.¹⁻² However, in the case that the second premolar were unrestorable or needed complicated treatment, removing the first premolars which were sound teeth might not be worth doing. Therefore, anchorage control in this case was necessary and challenging. This case report describes the anchorage control using the indirect palatal miniscrew anchorage and distalization appliance (iPANDA)³ in a patient with Class I bimaxillary protrusion treated with maxillary second premolar and mandibular first premolar extraction.



Fig 1. Pre- and post- treatment intraoral examination and facial profile. (A-F: Pre-treatment, G-L: Post-treatment)

History and examination

The twenty-nine years old female patient presented with the chief complaint of protrusion of her anterior teeth. Extraoral examination showed a symmetric mesiofacial type, convex profile. Intraoral examination revealed Class I bimaxillary protrusion with 11 pulp necrosis with asymptomatic apical periodontitis, 15 retained root, 25 pulp necrosis and tongue thrusting habit (Fig 1;A-F).

The cephalometric analysis showed skeletal Class I relationship with orthognathic maxilla, orthognathic mandible, and open vertical configuration. Upper and lower incisors were protruded position and proclination. Upper and lower lips were protruded in relation to E-line (Fig 3 and Table 1).

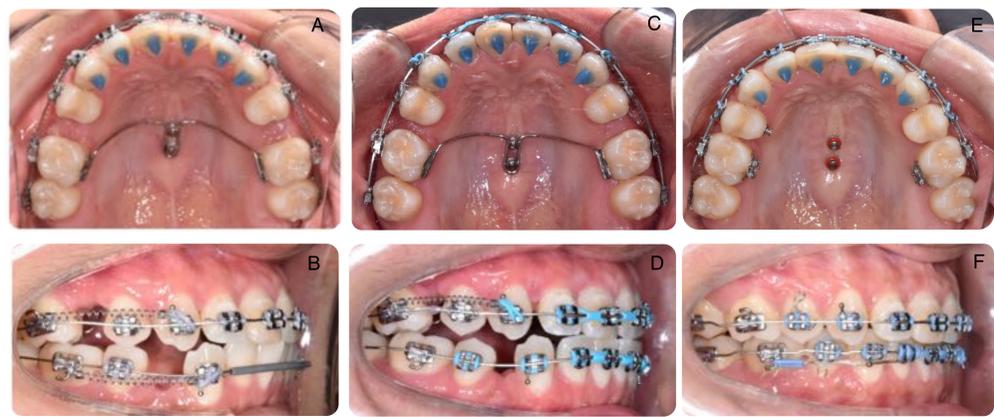


Fig 2. Treatment progress show simultaneous retraction of the canine and the first premolar using iPANDA for anchorage control. (A,B: Retraction 3 months; C,D: Retraction 6 months; E,F: Finishing)

Treatment Objectives

- Reduce inclination and position of incisors
- Improve facial profile
- Eliminate tongue thrusting habits
- Establish a good functional occlusion

Treatment Plan

Extraction of teeth 15, 25, 34, 44 was selected. The treatment consisted of fixed appliance therapy with anchorage control using iPANDA to reduce the dental and lip protrusion and improve facial profile. Customized tongue spurs were used to eliminate tongue thrusting habit. (Fig 2).

Treatment Results

Post-treatment incisors inclination and lip protrusion were reduced without anchorage loss. A good functional occlusion was achieved, and the tongue thrusting habits has been eliminated (Fig 3 and Table 1).

Total treatment time was 35 months consisted of leveling and aligning phase (3 months), retraction phase (17 months), and finishing phase (15 months).

Additionally, the patient was very satisfied with the treatment outcomes and her facial profile. (Fig 1;G-L, 3 and Table 1)

Discussions

The first premolar are usually selected to be remove to provide the space for improving the dental and lip protrusion in bimaxillary protrusion cases. Moreover, the anchorage situation is necessary to correct severe protrusion and improve facial profile.¹⁻² However, in this case, the tooth 15 and 25 was considered to remove instead. Therefore, the anchorage control was a critical key to the success of this treatment.

Miniscrews have been recommended for anchorage reinforcement with a high anchorage capacity. However, anchorage loss can be found about 1.5 mm during leveling and aligning phase.⁴ Therefore, in this case, an iPANDA³ was selected and used in the early stage of treatment to keep the position of the maxillary molars. The results show the effectiveness of iPANDA in providing indirect maximum anchorage, since the anchorage loss was not found.



Fig 3. Pre- and post- treatment cephalograms and the superimposition.

Skeletal relationship	Pre-treatment	Post-treatment	Dental relationship	Pre-treatment	Post-treatment	Soft tissue relationship	Pre-treatment	Post-treatment
SNA	86.5	86.5	U1-FH	123.9	108.9	Upper lip to E- line	2.8	0.1
SNB	81	81	L1-MP	101.0	90.2			
ANB	5.5	5.5	U1-L1	106.5	132.2	Lower lip to E-line	5.2	0.7
FMA	28.3	28.3	UPDH	22.9	23.1			
			LPDH	27.6	27.8			

Table 1. Cephalometric analysis

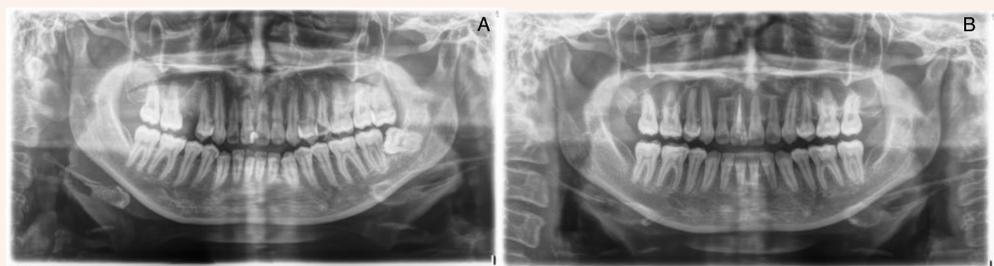


Fig 4. Pre- and post panoramic radiographs. (A: Pre-treatment; B: Post-treatment)

Conclusion

Anchorage control using iPANDA was effective in orthodontic treatment of a patient with Class I bimaxillary protrusion treated with maxillary second premolar extraction. Satisfactory outcomes with a good functional occlusion can be achieved without anchorage loss.

References:

1. Ruellas ACO, Ruellas RMO, Romano FL, Pithon MM, Santos RL. Tooth extraction in orthodontics: an evaluation of diagnostic elements. *Dental Press J Orthod.* 2010;15(3):134-57.
2. Proffit WR. *Contemporary orthodontics.* 6th edition. ed. Philadelphia, IL: Elsevier; 2018.
3. Suzuki EY, Suzuki B. Maxillary molar distalization with the indirect Palatal miniscrew for Anchorage and Distalization Appliance (iPANDA). *Orthodontics (Chic).* 2013;14(1):e228-4
4. Ganzer, N., Feldmann, I., & Bondemark, L. Anchorage reinforcement with miniscrews and molar blocks in adolescents: A randomized controlled trial. *American Journal of Orthodontics and Dentofacial Orthopedics.* 2018;154(6), 758-767.