



CASE REPORT

Technical Modifications of Tooth-borne Distraction Device for Anterior Maxillary Distraction in Cleft Patients

¹Dhivakar Selvaraj, ²Sunil Richardson

ABSTRACT

The tooth-borne distractor gained popularity for anterior maxillary distraction because of the effective treatment outcome, no need for external fixation, noninvasive, less chewing difficulty, social tolerance and economical. Tooth-borne distractor device needs modification in terms of maxillary deficiency, tooth position, retained deciduous tooth, and fistula. Hence, we recommend the following modifications in certain circumstances for the successful treatment outcome.

Keywords: Cleft patients, Anterior maxillary distraction, Maxillary deficiency, Tooth-borne distractors.

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INTRODUCTION

Cleft patients often have maxillary deficiency along with missing teeth, impacted teeth, retained deciduous teeth, and crowding. Skeletal and dental malocclusions are effectively managed with combined orthodontic treatment and surgical advancement. Compared with Lefort I maxillary advancement for maxillary deficiency, distraction procedures produces comparatively stable results and possibility to do even during the growing phase.¹ Currently, distraction procedures like external, internal, and tooth-borne distractions are used.

Anterior Maxillary Distraction

Nowadays, anterior maxillary distraction² with tooth-borne procedure gained much popularity because of the effective

treatment outcome, no need for external fixation, noninvasive placement procedure, less chewing difficulty, social tolerance and economical. Further, it not only improves the esthetic outcome of the patient, but also helps to relieve crowding and molar correction by utilizing the space created by distraction site.

Modified Anterior Maxillary Distraction

In our previous study,³ the importance of the screw position and anchorage demand where the distraction was bent

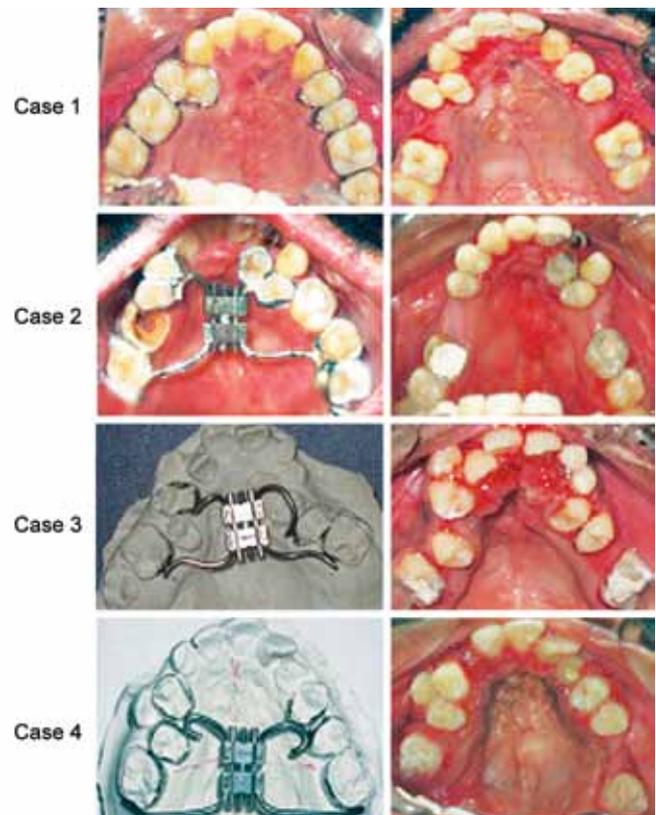


Fig. 1: Appliance modification: Case 1: 21/M—Malpositioned premolar made adaptation of screw leg (length and bending) was cumbersome for soldering with bands. So, it was modified by banding both the premolars together rather individually; Case 2: 24/M—Grossly decayed 1st molars required root canal treatment. So, it was modified by banding 2nd and 3rd molar teeth as posterior anchorage units. Though banding 3rd molars was difficult it was unavoidable; Case 3: 20/M—Severe crowding in the posterior segment with palatally positioned left premolar. Modification was done as anterior leg to pass over the occlusal aspect because of the difficulty to keep it along the lingual side; Case 4: 11/F—Posterior anchorage was questionable so activation schedule was modified as four times a day at regular interval to reduce resistance and to prevent appliance dislodgement

¹Professor, ²Consultant

¹Department of Orthodontics, Rajas Dental College, Kavalkinaru Tirunelveli, Tamil Nadu, India

²Department of Oral and Maxillofacial Surgery, Dr Jeyasekharan Hospital, Nagercoil Kanyakumari, Tamil Nadu, India

Corresponding Author: Dhivakar Selvaraj, Professor Department of Orthodontics, Rajas Dental College, Kavalkinaru Tirunelveli, Tamil Nadu, India, Phone: 09444154454, e-mail: orthodhiv@gmail.com

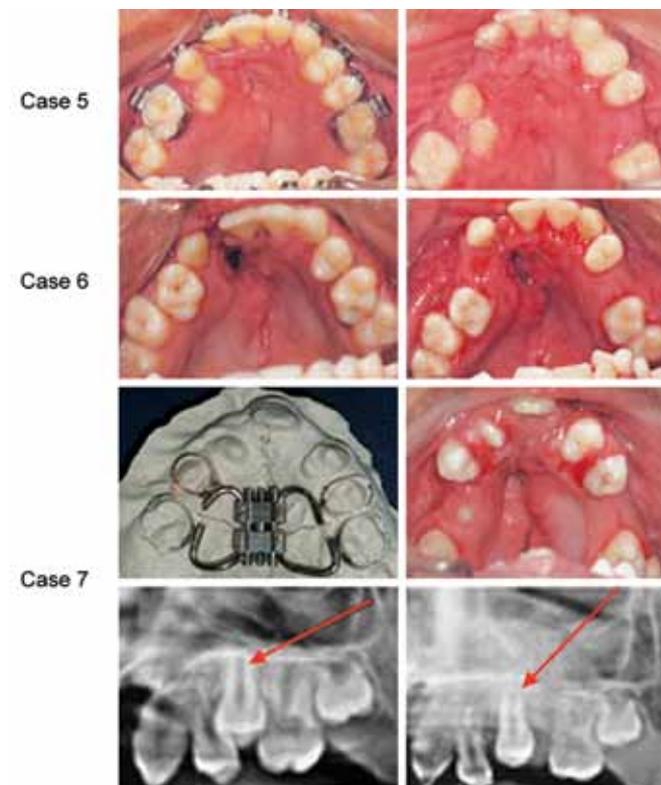


Fig. 2: Surgical modification: Case 5: 21/F—Upper midline was shifted toward right side with congenital missing right central incisor. To correct midline shift and to replace missing tooth surgical cut was modified between lateral incisor - canine on right side and between 2nd premolar and 1st molar on left side for asymmetric movement; Case 6: 23/F—Palatal fistula was present in relation to right anterior region. So, osteotomy was modified by involving the fistula in the anterior region to prevent further increase in size of the fistula and failure of distraction; Case 7: 12/M—Maxillary 1st molar was moved mesially due to early loss of 2nd deciduous molar which lead to lack of space for 2nd premolar. Surgical cut was modified by involving 2nd premolar in the anterior segment. After distraction, 2nd premolar was spontaneously erupted in the distraction site

perpendicular to the transpalatal plane, parallel to facial midline, and occlusal plane horizontally which produces anterior segment movement in a predetermined direction was stressed. Since, each case was unique in terms of maxillary deficiency, tooth position, retained deciduous tooth and fistula, we have to modify anchorage units, band position, legs of the screw soldering with the band and surgical cut without altering the screw angulations. So, orthodontist plays a key role for the successful outcome and we recommend the following modifications in terms of appliance design (Fig. 1) and surgical procedure (Fig. 2).

CONCLUSION

Distraction procedure is possible irrespective of age, so orthodontist should be in a position to modify the distractor placement and anchorage demand based on the diagnosis at that particular age along with surgical limitation to obtain a successful treatment outcome.

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