

Esthetic Management of Unilateral Cross Bite with Dento-vestibular Enhancement Prosthetic Appliance

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Received: 4 July 2010 / Accepted: 22 May 2011 / Published online: 14 June 2011
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Abstract Unilateral crossbite is a commonly encountered condition in clinical practice. The most frequently employed treatment protocol to manage unilateral crossbite is orthodontic correction or orthognathic surgery or combination of both. When the clinical situation less favours both these modalities of management, a transitional prosthetic appliance—dentovestibular enhancement prosthetic appliance— can be effectively used to manage this condition.

Keywords Unilateral cross bite · Esthetics · Dento vestibular enhancement appliance

Introduction

Unilateral crossbite is a commonly encountered condition in clinical practice. The etiology for this condition can be multifactorial viz delayed exfoliation of deciduous teeth-resulting in palatal eruption of permanent teeth, congenital abnormalities of jaw and trauma to the jaw and associated structures [1].

The most frequently employed treatment protocol to manage unilateral crossbite is orthodontic correction or orthognathic surgery or combination of both. When the clinical situation less favours both these modalities of management, the skills of clinician can be formidably challenged [2].

Clinical Report

A 22-year-old, female patient with a primary concern of a facial dimple on the left upper lip region and inward

placement of teeth in the left side of upper jaw (Fig. 1), reported to Department of Prosthodontics, Saveetha Dental College, Chennai.

History revealed that she had retained her deciduous maxillary teeth on the left side with palatal eruption of corresponding permanent teeth 22, 24, 25, 26. The palatally positioned maxillary teeth were unable to offer adequate support to the adjoining orofacial structures and thus resulted in a partial segmental facial collapse. She later underwent extraction of all the retained deciduous teeth on the left side.

On examination, the patient presented with dimpling of left upper lip on the left side with concomitant facial collapse on the same side. Intraoral examination revealed she had unilateral cross bite on the left side with palatal eruption of 22, 24, 25, 26 with congenital absence of 21 & 23 and premolars were rotated and spacing was present between corresponding teeth with moderate oral hygiene.

To manage the cross bite and facial dimpling, various treatment modalities including orthodontic repositioning and surgical correction were explained to the patient [3].

Patient was very apprehensive regarding the surgery and since she had her marriage fixed within proximity of three months, she deferred orthodontic treatment and requested for any other esthetic correction if possible. Then the patient was provided an option to be treated with Dento vestibular enhancement prosthetic appliance (DEPA), and she willingly agreed for the treatment protocol [4].

Clinical Procedure

- 1 The patient was subjected to a thorough oral prophylaxis and oral hygiene instructions were given.
- 2 Pre-operative diagnostic OPG was made and the radiograph revealed congenital absence of 21 and 23.

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Fig. 1 Pre-prosthetic intra oral view



Fig. 2 Wax up—lateral view



Fig. 3 Wax up—frontal view



Fig. 4 Wax try in—intra oral view

- 3 Diagnostic impressions were made with irreversible hydrocolloid, alginate (Zelgan, Dentsply India) and casts were poured with Type III dental stone (Kalstone, Kalabhai Karson India).
- 4 Diagnostic casts were surveyed, followed by face bow transfer using earpiece face bow (Hanau™ spring-bow) and diagnostic casts were mounted on a semiadjustable articulator (Hanau™ wide-vue arcon 183-2), and degree of crossbite relationship and occlusal relationship of upper posteriors with corresponding lower teeth were evaluated (Figs. 2, 3).
- 5 The final impressions were made with addition polyvinylsiloxane (Aquasil-softputty/ultraLv, Dentsply Germany) and master casts were poured.
- 6 Upper master cast was surveyed for suitable undercuts to place the retainers for the appliance and the facebow transfer was done and mounted on Hanau™ wide vue arcon 183-2. Articulator.
- 7 Then the appliance was designed on articulated master cast. This appliance involved fabrication of auto polymerizing resin labial plate major connector waxed to enhance the collapsed vestibulo-facial

tissues to obtain desirable support and esthetics followed by arrangement of artificial teeth labial to the existing natural teeth (Figs. 2, 3) which was retained by wrought wire direct retainers engaging the suitably identified palatal undercuts [5, 6].

- 8 The undercuts were identified for the palatal aspect of 11 & 26 and wrought wire retainers were adapted and the fabricated labial plate major connector extended from 17 to 26. The superior extent of the major connector extended 2 mm short of maxillary vestibular sulcus and inferiorly terminated overlapping the marginal gingiva and interdental papilla [7].
- 9 Later the framework was tried in patient mouth for facial esthetics, lip and vestibular fullness and the resultant support to the orofacial structures.
- 10 Then shade matching and size determination of suitable artificial teeth was performed, then artificial teeth were arranged over the framework and tried in the patient mouth and patient consent was obtained (Figs. 4, 5).
- 11 The framework was processed with heat curing acrylic resin (Trevalon, Dentsply India) finished and polished (Figs. 6, 7). This appliance involves a framework of labial plate major connector extending from vestibule to marginal gingival with adequate thickness to



Fig. 5 Wax try in—palatal view



Fig. 8 Finished prosthesis—intra oral view



Fig. 6 Finished prosthesis



Fig. 9 Finished prosthesis—palatal view



Fig. 7 Finished prosthesis

provide support to the facial tissues and set of artificial teeth arranged labial to existing permanent natural teeth [8].

12 The finished appliance was tried on the patient (Figs. 8, 9) and esthetics, retention, stability and

support were evaluated followed by post-insertion maintenance protocol instructed to the patient. The patient was recalled and reviewed after 1 week and was comfortable with the appliance and extremely satisfied with the treatment outcome.

Discussion

DEPA is a special type of prosthesis that can be used to restore esthetics and functions in clinical situations which involves lack of adequate facial tissue support due to collapse of orofacial structures and resultant compromise in esthetics. This prosthesis can successfully provide support to the collapsed facial tissues with the suitably contoured labial plate major connector, provide good esthetics with the artificial teeth and possess good retention through wrought wire retainers. This prosthesis is a transitional appliance that can successfully provide good esthetics and function till a definitive treatment is accomplished. Meticulous oral hygiene should be maintained for sustained success of the prosthesis and this transitional

prosthetic appliance can be a very effective alternate treatment option to enhance esthetics and support in selective clinical situations like unilateral or bilateral crossbite, esthetic management of collapsed dentofacial structures as in hemifacial microstomia, traumatic intrusion of maxilla, cleft palate and cleft lip [9].

Conclusion

DEPA can be a potentially effective treatment option when clinical situation warrants a non-orthodontic and non-surgical esthetic management of unilateral or bilateral cross bite.

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