

# Comprehensive Management of Adult Bilateral Cleft Lip and Palate Patient

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## Abstract

Interdisciplinary approach requires a successful cleft lip and palate rehabilitation. When the patient is an adult then the problem becomes even more challenging. This case report describes management of 19-year-old female patient with untreated bilateral cleft who had come for the orthodontic correction of irregular upper teeth. Maxillary expansion was done followed by bone grafting and lip correction after the dental alignment. Interdisciplinary approach is must to get optimal facial and dental aesthetics.

**Keywords :** Cleft lip and Palate, Abbe flap, NiTi Expander, Secondary Bone Grafting.

## Introduction

Cleft lip and palate are the most commonly seen congenital abnormalities at the time of birth. Individuals born with cleft palate may face a number of challenges, including anatomical deformities, facial aesthetics, dental malocclusion, hearing impairment, and speech disorder. Hence, successful cleft lip and palate rehabilitation requires an interdisciplinary approach.<sup>1</sup>

Those patients having untreated bilateral cleft palate showed maxilla with decreased transverse dimension and posterior cross bite. The premaxilla was growing more vertically than sagittally. To help the correction of constricted maxilla often a maxillary expander<sup>2</sup> is used which is followed by secondary bone grafting<sup>3</sup> and palate closure.

This case report describes management of 19 year old female with bilateral cleft palate and

repaired lip with maxillary transverse deficiency who had undergone premaxilla repositioning and cleft repair.

## Case Report

A 19-year-old female patient with bilateral cleft presented with a chief complaint of irregularly placed upperteeth. Maxillary expansion was done followed by bone grafting and lip correction after the dental alignment.

On extraoral examination patient showed operated upper bilateral cleftlip scar and a lower median lip scar. Patient gave a history of lip closure at 8 months and palate repair at 3 years. The patient had undergone an Abbe flap<sup>4</sup> surgery at the age of 11 years. Patient was having convex profile with hyperdivergent face, with facial asymmetry. The nasolabial angle was acute and having competent lips (Fig. 1A to 1D).

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Fig. 1A to 1D: Extraoral photographs of patient. (A) Pretreatment frontal view, (B) Pretreatment submental view (C) Pretreatment right profile view, (D) Pretreatment left profile view.

On intraoral examination, patient showed bilateral posterior and anterior crossbite with anterior open bite. On examination of the upper arch the patient had bilateral cleft and mobile premaxilla. In upper arch patient presented with multiple teeth in the anterior region especially on the left side.

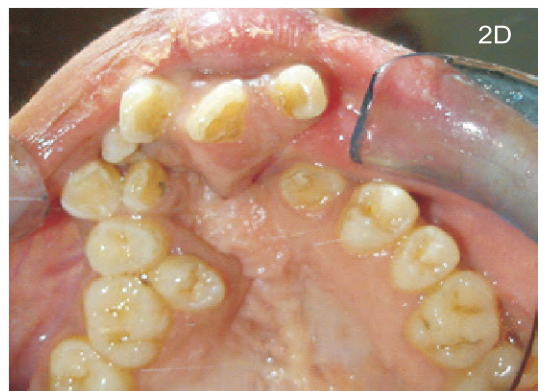


Fig 2A to 2D: Intraoral photographs of patient. (A) Pretreatment intraoral frontal (B) Pretreatment intraoral right (C) Pretreatment intraoral left (D) Pretreatment upper arch

Patient had one extra lateral incisor on that side and second premolar had erupted lingually, maxillary left lateral incisor and canine had erupted transposed. The canines on both the sides were in cross bite, with cusp to cusp premolar relation.

The lower arch on examination showed full complement of teeth except third molars and there was mild crowding visible. (Fig. 2A to 2D).

Patient had vertical growth pattern and hyper nasal speech.

### Problem List

1. Skeletal: Constricted and deficient maxilla with bilateral cleft palate
2. Soft tissues: Concave profile, acute nasolabial angle
3. Dental: Anterior and Posterior crossbite, Supernumerary in left lateral incisor region. Transposed maxillary left lateral incisor and canine

### Treatment Plan

Presurgical orthodontics: Abbe flap surgery was performed which involved a full-thickness composite flap, involving the transfer of the skin, muscle, and mucosa of the central part of the lower lip to the upper lip.

Orthodontic treatment: Patient was treated with comprehensive fixed mechanotherapy using 022" MBT prescription. All the teeth were bonded and first molars were banded. Before bonding extraction of supernumerary tooth, upper left lateral incisor and lingually placed left premolar was done. NiTi expander was customised and placed for slow maxillary expansion. The 42mm size of NiTi expander was used for this patient. Levelling and alignment was done using 0.016" NiTi wire followed by 0.019" X 0.025" NiTi followed by 0.019" X 0.025" Stainless steel wire.

Lower posterior bite blocks were cemented with FUJI 1 Glass Ionomer cement for disocclusion to correct the upper arch crossbites. Lower both the first premolars were extracted. Same mechanic of levelling and alignment was done using 0.016" NiTi wire followed by 0.019" X 0.025" NiTi followed by 0.019" X 0.025" Stainless steel wire. The space closure was done using active tie back mechanics. Once we reached in the rigid stainless steel wire, the patient had undergone a secondary bone grafting procedure. The bone graft was taken from tibia bone. After the space closure finishing and detailing was done on 014" stainless steel wire. Settling elastics were given for 2weeks. At the end of the treatment, lower arch was well aligned and upper midline had shifted towards left by 6mm. The patient had Class III molar relation on both the sides with edge to edge anterior bite. The upper anteriors were hypoplastic. (Fig 3A to 3I)



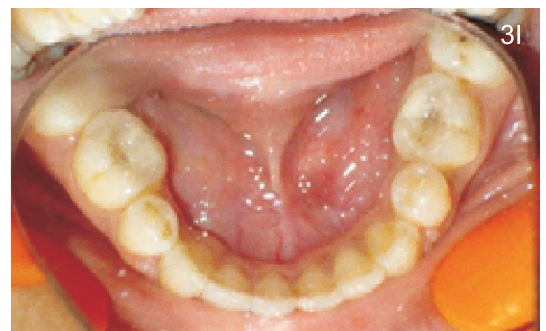


Fig 3A to 3I: Post treatment Extraoral /intraoral photographs of patient (A) Extraoral frontal view, (B) Extraoral frontal smile view (C) Extraoral right profile view, (D) Extraoral left profile view. (E) Intraoral frontal (F) Intraoral right (G) Intraoral left (H) Upper arch (I) Lower arch.

To improve the aesthetic appearance of the patient, composite build-ups were done. (Fig. 4)

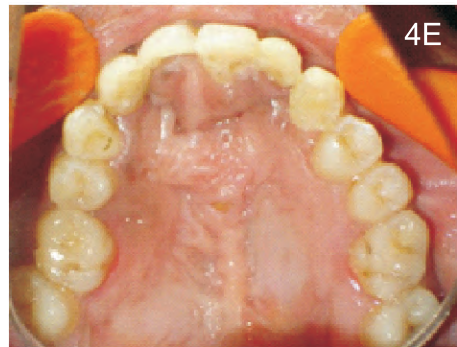


Fig 4A to 4E: Post treatment after composite buildup Extraoral/intraoral photographs of patient. (A) Extraoral frontal smile view (B) Intraoral frontal (C) Intraoral right (D) Intraoral left (E) Upper arch.

### Discussion

In the presented case, the untreated bilateral cleft with hanging premaxilla was treated and patient's smile was improved.

Abbe procedure provides several advantages for reconstructing the philtrum and Cupid's bow of severely deformed bilateral cleft lip patient. This procedure helps in correction of poorly defined philtrum and Cupid's bow as well as abnormal skin texture, or soft tissue discrepancy in volume between the upper and lower lips. This vermilion-pedicle flap, based on the inferior labial vessels, has been used for secondary corrections in cleft deformities, more often in bilateral cases. Indications for its use include deficiency or scarring of the central part of the upper lip, thinness of the vermilion with a non-existent lip tuberculum, or the absence of a Cupid's bow. With the help of this procedure, one is able to move the visible cleft lip scar from central portion of the lip to the anatomical margin of the aesthetic unit. The scar in accordance with the margin of aesthetic unit is inconspicuous and virtually invisible.<sup>4</sup>

Broadbent<sup>5</sup> reported using an Abbe procedure in 16 patients with bilateral cleft lip and palate with full-thickness skin harvested from the

supra clavicular fossa for replacement of the entire upper lip as a single unit. It was stated that after 8 months, lip function, shape, and color match were satisfactory.

Nadjmi et al<sup>6</sup> applied full-thickness skin graft from the right post auricular area to 13-week-old boy with bilateral complete cleft lip and palate. A six-month postoperative result was satisfactory. In this case the abbe flap was done and the results were shown to be satisfactory.

Increases in arch width obtained through slow palatal expansion procedures are generally thought to result in an orthodontic response. It is assumed that with slow maxillary expansion very little orthopedic effect is seen.<sup>7</sup>

By contrast with RPE generates a force of 450-900g, which may be insufficient to separate a progressively maturing suture. However, slow expansion procedures have demonstrated orthopedic effects comparable to those of RPE. Histologic examinations have shown sutural separation at a rate that maintains the integrity of the maxillary sutures by allowing for boneremodelling.<sup>8</sup>

Zachrisson<sup>9</sup> when compared slow expansion and RPE found that periodontal breakdown on the buccal aspects of posterior teeth occurred infrequently in both groups, but that the few patients who exhibited some attachment loss were mostly in the RPE group.

Slow expansion techniques offer a number of clinical advantages in addition to these biological benefits.<sup>8</sup> An ideal slow expansion appliance should require minimal adjustment throughout its use and should permit easy adjustment when necessary. It should deliver a constant physiologic force until the required expansion is obtained. It was seen with the help of NiTi expander. NiTi expander can be easily adjusted in any form and it delivers

constant force, without any activations.<sup>2</sup> The NiTi expander can be employed successfully in adult cleft palate patients. A study<sup>2</sup> to evaluate the efficacy of NiTi palatal expander demonstrated that it mainly shows orthodontic expansion. It has been shown in a cleft case that a the widening of the maxillary arch is satisfactorily achieved in the cleft constricted maxillary arch using the niti expander. So to expand in this case we used a niti palatal expander. After expansion the cleft was clearly visible in this case.

The main objective of secondary alveolar bone grafting is to fill the residual osseous cleft of the alveolus and anterior palate as stated by Boyne and Sands.<sup>10</sup> It also helps in enhancing maxillary stability especially in bilateral clefts with mobile premaxilla as shown by Åbyholm et al.<sup>11</sup> Secondary alveolar grafting consolidates the maxilla to facilitate secondary surgery as told by Amanat and Langdon.<sup>12</sup> One is able to give bony support to the adjacent dentition as shown by Kortebein<sup>13</sup> et al. According to Bergland et al<sup>14</sup> sagittal and transverse growth has virtually ceased by 8–9 years and the chances of interfering with maxillary growth are minimal after this age. However, vertical growth continues until adolescence and is affected by secondary bone grafting as shown by Enemark et al.<sup>15</sup> Studies have shown that cancellousbone grafts are favoured overcortical bone due to the abundance of osteogenic surface cells, many of which survive and initiate new bone formation<sup>11</sup>. The iliac crest is the most popular site for obtaining the graft material because of its abundance of cancellous bone which transforms rapidly into alveolar bone<sup>14</sup>. In this case late secondary bone graft was used which was taken from tibia.

## Conclusion

Successful cleft lip and palate rehabilitation requires an interdisciplinary approach. When the patient is reluctant to interdisciplinary approach and requests for orthodontic treatment alone, the problem becomes even more challenging. However, the presented case showed improved esthetics with nonsurgical orthodontic camouflage treatment, which is not possible in all cases. Interdisciplinary approach is must to get optimal facial and dental esthetics.

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