Cleft Palate Rehabilitation : A Combined Orthodontic Surgical and Prosthodontic Approach

Maj B Jayan^{*}, Lt Col AK Nandi⁺, Col HS Dhot[#]

MJAFI 2002; 58 : 340-342

Key Words : Orthodontics; Prosthesis; Subapical osteotomy

Introduction

Cleft lip and palate are one of the common birth defects occurring in 1.7 per 1000 live births in India [1]. The presence of cleft palate results in growth deficiency of maxilla in all the three dimensions leading to both aesthetic and functional problems. This clinical report describes the combined orthodontic, surgical and prosthodontic rehabilitation of an adult patient with incomplete surgical closure of congenital unilateral cleft lip and palate deformity who had not undergone any orthodontic and prosthodontic intervention.

Case Report

An 18 year old male sought our consultation for unaesthetic facial appearance, dental irregularity, speech and mastication difficulty. This appeared to have a profound effect on his self esteem and therefore the motivation for treatment was high. He gave a history of lip closure at 2 years and surgical repair of palate at 12 years. He had not undergone any orthodontic treatment.

The surgical closure of cleft lip was satisfactory whereas that for palate had failed to close the communication between the oral and nasal cavity. Clinical examination and evaluation of diagnostic records revealed relative mandibular excess resulting in a concave facial profile. The maxillary arch showed the defect involving the alveolar ridge on the right side and a part of hard palate. Dental examination revealed a missing 12, partially erupted 13, medially drifted 11, reverse overjet of 10 mm (Figs. 1,2,3,4).

The correction was done in phases. Pre-surgical orthodontic phase was carried out using 018 Roth pre-adjusted edgewise appliance and 016 pre-formed Niti wire. Satisfactory alignment of both arches was achieved in 3 months. Preparation of the surgical phase included cementation of posterior acrylic bite blocks which created a transient anterior open bite. This enabled easy retraction of lower anterior segment. Mandibular anterior sub-apical osteotomy was done under general anaesthesia to correct the reverse overjet and improve profile. Vestibular incision beginning in the mandibular second bicuspid region was carried around on the opposite side. 34 & 44 were extracted and vertical osteotomy was performed through the sockets of extracted pre molars. Horizontal osteotomy cut was placed 4 mm

below the root apices and connected with the vertical osteotomy cuts. Once the dento-alveolar segment was freed, it remained pedicled to lingual muco-periosteum. The segment was repositioned posteriorly and stabilised by RIF using SS minibone plates. 018 AJW arch wires were placed intra-operatively, distal ends were cinched. This not only augmented stabilisation but also simultaneously initiated post surgical orthodontics. Box elastics in the premolar molar region corrected the open bite and class I elastics avoided the opening up of spaces post-operatively. At the end of post surgical orthodontics, which lasted for 6 months satisfactory occlusion was obtained.

Debonding and debanding was done. Upper and lower alginate impression was made. The area of defect on the maxillary cast was blocked out with plaster to the required

Fig. 1 : Pre-treatment profile view

^{*}Graded Specialist (Orthodontics), 200 MDC, C/o 56 APO, ⁺Classified Specialist (Oral & Maxillofacial Surgery), Military Dental Centre, Gough Lines, Secunderabad - 500 015, [#]Commanding Officer & Corps Dental Advisor, 4 Corps Dental Unit, C/o 99 APO.

Fig. 2 : Pre-treatment side view of study models

Fig. 3 : Pre-treatment frontal view of study models

height and shape of the palate. The maxillary prosthesis which was made in hot cure acrylic provided full coverage of the palate and included replacement of 12 in addition to a labial bow, adams crib on 16 and 26. The prosthesis also served as a retention appliance. A Beggs wrap around retainer was placed in the lower arch for retention.

Post treatment status revealed, obvious reduction in facial concavity. Intraorally a good buccal occlusion with normal overjet and overbite was achieved. Overall the patient presents balanced and harmonious features both at rest and function. The changes produced by this integrated procedure have satisfied the patient's expectations. He has regained selfesteem and confidence (Figs. 5,6,7,8).

Discussion

Clefting of the primary and / or secondary palate leads to a series of distortions in dento-facial development. The affected individual requires prolonged treatment by a well co-ordinated inter-disciplinary approach [2]. Early and definitive orthodontics are im-

Fig. 4 : Pre-treatment radiograph (true right lateral view with profile marking)

Fig. 5 : Post treatment profile view

Fig. 6 : Post treatment side view of study models

Fig. 7 : Post treatment intra-oral frontal view

portant phases of treatment of cleft lip and palate cases [3]. In some cases, like the case being discussed, due to lack of awareness and non availability of well coordinated cleft palate teams, the individuals often fail to undergo early orthodontic treatment. This greatly affects both dento-facial aesthetics and function. Rehabilitation of these adult cases are of paramount importance because it affects the self esteem and confidence of the individual.

In this case, integrated orthodontic, surgical and prosthodontic procedure not only improved dento-facial aesthetics but also mastication and speech. In this case, where the surgical results have not been successful, a removable prosthesis was provided which not

Fig. 8 : Post treatment radiograph (true right lateral view with profile marking)

only restored form and function but also served as a retention appliance [4].

References

1. Sidhu SS. Incidence, classification, distribution and etiology of cleft lip and / or cleft palate anomaly. In : Kanappan JG, editor. Cleft palate, cleft lip and oro-facial anomalies : a multi disciplinary approach. 1st ed. Shanti-Anand Publishers:Madras, 1988;1-15.
2. Proffit WR, Turvey TA. Special problems in cleft-palate patients. In : Proffit WR, White RP, editors. Surgical orthodontic treatment. St Louis, Missouri Mosby year book 1991;625-59.
3. Proffit WR, Fields HW. Orthodontic treatment planning : limitations and special problems. In : Proffit WR, Fields HW, editors. Contemporary orthodontics, St Louis, Missouri Mosby year book 1992;257-64.
4. Desjardins RP. Prosthodontic management of cleft-palate patient. J Prosthet Dent 33;655-65.