Journal of Advanced Medical and Dental Sciences Research

@Society of Scientific Research and Studies ***NLM ID:*** *101716117*

Journal home page: www.jamdsr.com doi: 10.21276/jamdsr Index Copernicus value = 91.86

(e) ISSN Online: 2321-9599; (p) ISSN Print: 2348-6805

Original Research

Management of an adult cleft lip and palate patient with combined orthodontic and prosthodontic approach

[1]Partha Pratim Choudhury, [2]Ekta Lahoti, [3]Tapan Kumar Giri

[1]Assistant Professor, Department of Orthodontics & Dentofacial Orthopedics, Dr. R. Ahmed Dental College & Hospital, Kolkata, West Bengal, India
[2]Clinical Tutor, Department of Dentistry, Calcutta Medical College & Hospital, Kolkata, West Bengal, India
[3]Professor & PG Guide, Department of Prosthodontics, Dr. R. Ahmed Dental College & Hospital, Kolkata, West Bengal, India

ABSTRACT:
The comprehensive treatment of a patient with cleft lip and palate requires an interdisciplinary approach for best functional and esthetic outcomes.Unilateral cleft lip is almost eight times more frequent than bilateral and twice more frequent on the left sideHere, a case report of a27-year-old woman with left sided cleft lip and palate has been presented. She had congenitallymissingupper left lateral incisor, retained upper left deciduous canine, maxillary and mandibular crowding with 32 and 35 in cross bite,a malformed 21 and non-grafted cleft palate on left side. Alignment was done and unilateral distalization of the left maxillary dentition with IZC screw was done to gain space for prosthesis. Prosthetic rehabilitation of missing 22 and malformed 21 were performed thereafter in the form of FPD.The end result of this ortho-prostho synergistic approach was quite satisfactory with considerable improvement in smile characteristics and functional occlusion.
Key words: Adult CLP patient, missing lateral incisor, unilateral distalization, IZC implant, interdisciplinary treatment

Received: 15 September, 2021 Accepted: 20 October, 2021

Corresponding author: Ekta Lahoti, Clinical Tutor, Department of Dentistry, Calcutta Medical College & Hospital, Kolkata, West Bengal, India

This article may be cited as: Choudhury PP, Lahoti E, Giri TK. Management of an adult cleft lip and palate patient with combined orthodontic and prosthodontic approach. J Adv Med Dent Scie Res 2021;9(11):183-189.

INTRODUCTION

Cleft lip and palate (CLP) is considered to be the most common congenital craniofacial abnormality with incidence varying between 1 and 1.82 for each 1000 births[1]. The etiology ismultifactorial involving both genetic or environmental factors.Unilateral cleft lip is almost eight times more frequent than bilateral and twice more frequent on the left side[2]. Depending on the site and severity of the cleft, patients may developmidface deficiency, Class III tendency, persistent oronasal fistulae,nasal intonations,alterations in shape and number of the lateral incisors,and, occasionally, supernumerary teeth[3].CLP patients might suffer from unfavourable smile esthetics and low self-esteem, leading mainly to difficulties in social interactions[4].Providing treatment to a cleft patient with complicated problems is always a complex task. The most significant advances in thetreatment of cleft lip and palate happened with the developmentof the multidisciplinary approach in a coordinated manner inorder to obtain good results[2]. In adultpatients with orofacial clefts, most of the casesinvolve orthodontic treatment with orthognathic surgery or prosthetic treatment[5,6]The aim of this paper is to present the case of a27-year-oldpatient, with operated unilateral cleft lip palate and with a congenitally missing maxillary lateral incisor, treatedwith a combined orthodontic and prosthodontic team approach.

CASE REPORT

A 27 years old female patient reported with a chief complaint of malaligned upper and lower front teeth. On examination, it was found that patient had an operated left sided cleft lip and palate. The face was mesoprosopic with slightly concave profile (Fig 1).

Fig 1: Pretreatment extraoral photos

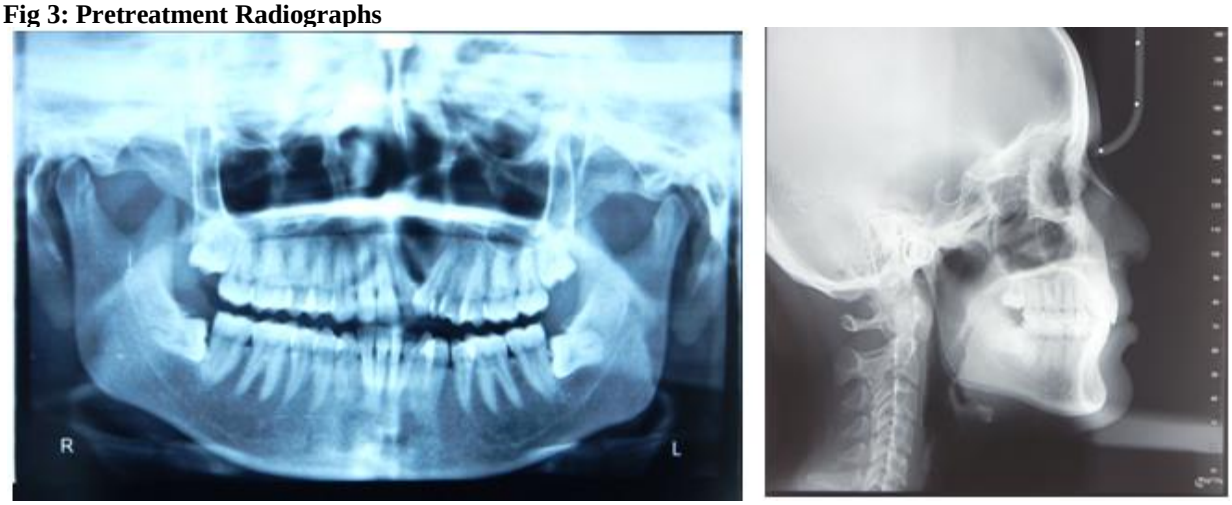
Lips were competent with protrusive lower lip. A flat alar base on left side and a deviated nasal septum with facial asymmetry was also found. Intraoral examination revealed that the left maxillary lateral incisor was missing (Fig 2).

Fig 2: Pretreatment intraoral photos

A malformed upper left central incisor and over-retained upper left deciduous canine werepresent. In the lower arch crowded anterior region with lingually tipped lower left first premolar was present. Lower left lateral incisor and second premolar were in crossbite.

Radiographs showed non grafted bony cleft in left side of the palate (Fig 3).

Fig 3: Pretreatment Radiographs



OPG Lateral cephalogram

CBCT

TREATMENT OBJECTIVE

The objectives of the treatment were to correct the malalignment of the upper and lower teeth and correction of the cross bite with respect to 32 and 35, creating sufficient space for replacement of missing upper left lateral incisor and finally providing a proper smile esthetics to the patient byprosthetic rehabilitation of the missing lateral incisor and malformed upper central incisor.

TREATMENT PLAN

The patient was planned to be treated with a combined orthodontic and prosthodontic approach. After extracting the retained deciduous canine complete decrowding of upper and lower arch was done with flexible wire along with correction of cross bites. In the later phase of orthodontic treatment, sufficient amount of space for the prosthesis of maxillary left lateral incisorwas created by unilateral distalization of the left maxillary dentition with the help of Infrazygomatic crest (IZC) implant.Prior to retraction upper left third molar was removed. At the end of the orthodontic treatment,considering the lack of bone support around the cleft area, a longer span four unit fixed prosthetic bridge was made including 11,21, and 23.

TREATMENT PROGRESS

At first the retained upper left deciduous canine was extracted followed by placement of round NiTiwire in both upper and lower arch. The bite was kept open so that decrowding could happen with simultaneous correction of the cross bite with respect to 32 and 35. During tooth movement care was taken to place 21 and 23 in correct position keeping their roots away from the cleft otherwise gingival recession could have happened. So, closing the space of the missing lateral incisor by adjacent tooth movementwas not feasible and prosthetic replacement was the only viable choice. After reaching rigid rectangular arch wire, the space required for prosthesis of missing lateral incisor was found to be inadequate. Therefore, after extracting 28, unilateral distalization of the left maxillary dentition with the help of IZCscrew (2x12mmSS) was done until sufficient space was created which simultaneously corrected end-on molar relation to a class I molar relation on the left side. (Fig 4).

Fig 4: Unilateral distalization with IZC

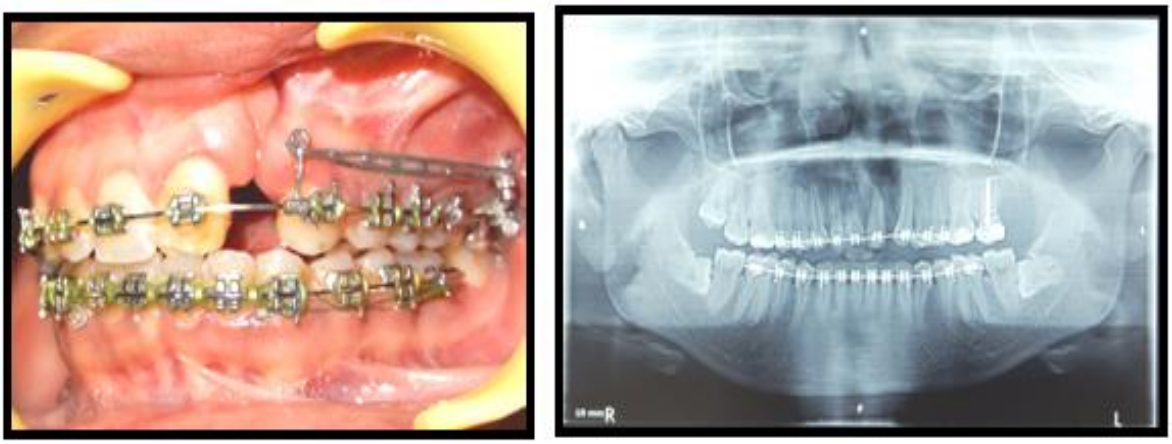


Fig 5: After debonding

Considering the lack of bone support around abutments, cantilever bridge was avoided. A four unitall ceramic bridge was made including 11,21, and 23 (Fig 6) that served the requirement of prosthesis for both malformed 21 and missing 22.

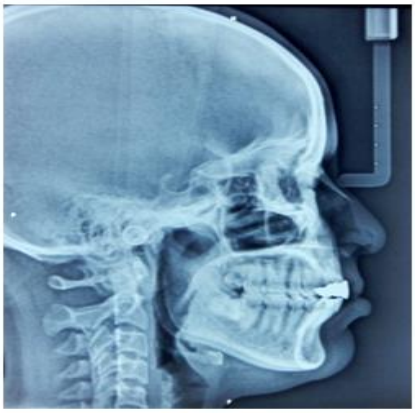
Fig 6: Crown reduction and prosthesis

RESULT

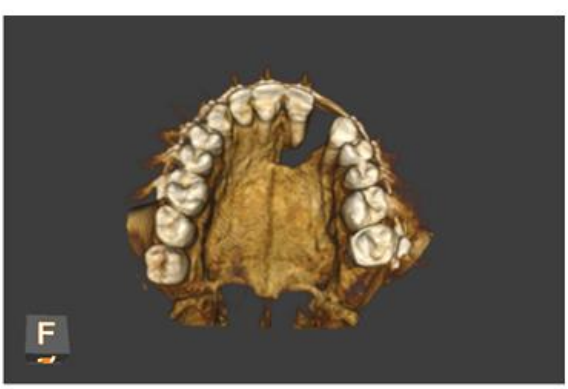
At the end of the treatment proper alignment of the upper and lower teeth was achieved with Angle class I molar and canine relations. The upper and lower midlines were coinciding. Sufficient space was created for the replacement of the missing lateral incisor by unilateral distalizationwith the help of IZC screw. After the final prosthesis, proper smile esthetics was established which was quite satisfactory to the patient (Fig 7).

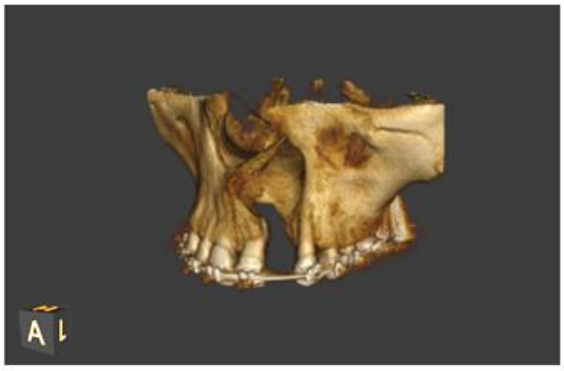
Fig 7: Post treatment intraoral and extraoral photos

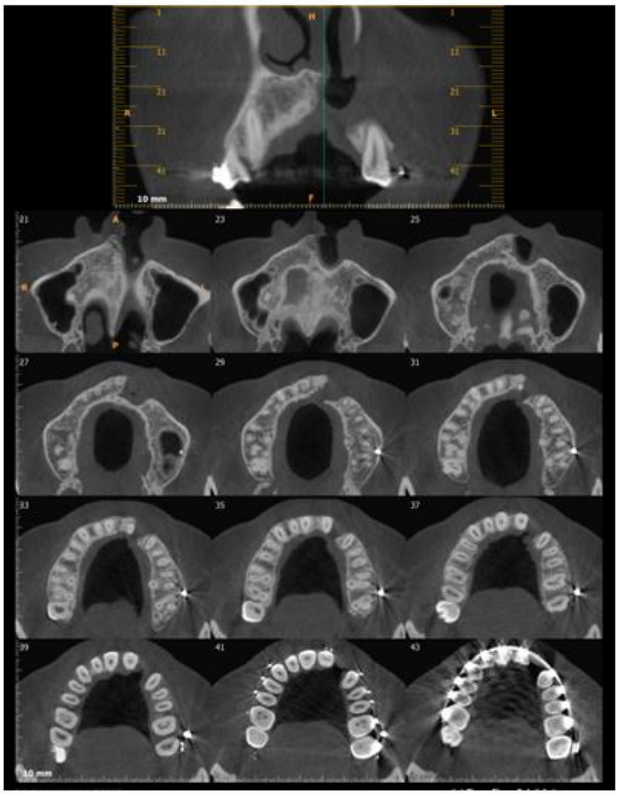
Fig 8: Post treatment radiographs



OPG Lateral cephalogram







CBCT

Fig 9: Pre & Post treatment comparison

Table1: Pre and post cephalometric values

Cephalometric parameters	Pre	Post
Skeletal		
SNA	80^0	80^0
SNB	78^0	78^0
ANB	2^0	2^0
SN-MP	28^0	28^0
FMA	24^0	24^0
Dental		
U1-NA	-1mm	5mm
U1-SN	88^0	102.5^0
L1-NB	5mm	7mm
IMPA	91^0	93^0
Soft tissue		
E line to UL	-4mm	-2mm
E line to LL	-1mm	0mm

DISCUSSION

Patients with cleft lip and palate often suffer from esthetic, morphological, and functional problems in the dentofacial region. The high prevalence of congenitally missing maxillary lateral incisors is due to a deficiency in the blood supply near the cleft, either congenitally or as a result of surgery, or a deficiency in the mesenchymal support to the maxillary lateral incisor near the cleft[6]. Because a deficiency of the mesenchyme can lead to insufficient mesenchymal support to the bud of the maxillary lateral incisor, cleft patients with a severe deficiency of mesenchymal mass could have congenitally missing maxillary lateral incisors[7]. Considering the lack of bone support in the cleft area, movement of the central incisor and canine towards the cleft was avoided. So, the space should not be closed by movement of these adjacent teeth. In addition, there would be Bolton's discrepancy with the lower arch bearing all complement of teeth. So, unilateral maxillary distalizationwas planned with IZC screw. Prior to retraction upper left third molar was removed.A long hook was placed in the upper arch wire adjacent to upper left canine to aid in bodily movement (Fig 4). Retraction was continued until sufficient space was created for prosthetic replacement of upper left lateral incisor. At the end of treatment, normal overjet and overbite was achieved and class I molar and canine relationship was achieved. Adequate dental alignment and maxillary and mandibular midline symmetry were also established. Post-orthodontic phase of treatment can be as challenging as the orthodontic phase of the treatment in patients with CLP depending on the type of cleft. This postorthodontic phase of treatment is fundamental, and the prosthetic rehabilitation of the missing upper left lateral incisor along with adjacentmalformed central incisor was best served by fixed prosthetic appliance. Implant was not an option for lateral incisor as there was practically no bone

support.Apart from that, the bone support around 21 and 23 were also compromised as evident from post treatment CBCT (Fig 8). So, instead of a cantilever bridge from canine, a longer span bridge extending from upper left canine to contralateral central incisor was placed that was also able to mask the deformity present in theupper left central incisor. For best esthetics all ceramic crowns were given. In addition, gum porcelain was added over the pontic to minimize visibility of the cleft in that region (Fig 6&7). The end result showed considerable improvement in the smile characteristics of the patient (Fig 9).

CONCLUSION

The treatment of patients with cleft lip and palate is always challenging for both the orthodontist and the multidisciplinary team. However, satisfactory results regarding functional occlusion, dental and facial esthetics can be achieved with a well-established diagnosis and treatment plan. Single-handedly neither the orthodontist nor the prosthodontist can achieve a proper result. The plan should always include what is best for the patient. As with all orthodontic treatment, long-term follow up is necessary to maintain the results.

REFERENCES

1. Derijcke A, Eerens A, Carels C. The incidence of oral clefts: a review. Br J Oral Maxillofac Surg 1996; 34:488-94.
2. Leiva Villagra, Noemí, Miguel Muñoz Domon, and Sebastian Véliz Méndez. "Comprehensive orthodontic treatment of adult patient with cleft lip and palate." *Case reports in dentistry* 2014 (2014).
3. Rocha, Roberto, et al. "Ideal treatment protocol for cleft lip and palate patient from mixed to permanent dentition." *American Journal of Orthodontics and Dentofacial Orthopedics* 141.4 (2012): S140-S148.
4. Thornton JB, Nimer S, Howard PS. The incidence, classification, etiology, and embryology of oral clefts. Semin Orthod1996; 2:162
5. W. Okada, T. Fukui, T. Saito, C. Ohkubo, Y. Hamada, andY. Nakamura, “Interdisciplinary treatment of an adult withcomplete bilateral cleft lip and palate,” *The American Journal ofOrthodontics and Dentofacial Orthopedics*, vol. 141, supplement4, pp. S149–S158, 2012.
6. K. Tai, J.H. Park,S.Okadakage,S.Mori, andY.Sato, “Orthodontic treatment for a patient with a unilateral cleft lip and palate and congenitally missing maxillary lateral incisors and left second premolar,” *The American Journal of Orthodontics and Dentofacial Orthopedics*, vol. 141, no. 3, pp. 363–373, 2012.
7. Ranta R. A review of tooth formation in children with cleft lip/palate. Am J Orthod Dentofacial Orthop1986; 90:11-8.