

Prosthetic Rehabilitation of a Patient with Congenital Oro-Nasal Defect with an Interim Prosthesis: A Case Report

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Abstract Rehabilitation in patients with facial defects requires multidisciplinary approach involving a head and neck surgeon, a maxillofacial prosthodontist and a reconstructive surgeon. Here we discuss a case of mid-facial defect due to a congenital anomaly for which a sectional impression was made. A removable nasal prosthesis obturating oro-nasal defect along with an overlay partial maxillary denture for the correction of malocclusion was given to the patient till definitive reconstructive surgery was performed.

Keywords Oro-nasal defect · Sectional impression · Overlay partial denture

Introduction

A multidisciplinary approach is required in patients with congenital anomalies, postsurgical cancer patients, and in a few trauma patients. It involves a team of head and neck surgeon, maxillofacial prosthodontist and reconstructive surgeon. In most of these cases, planning and preparation for rehabilitation is done prior to the surgery using a

coordinated approach of the entire team involved. Making the impression presents the initial difficulty in prosthetic rehabilitation. Several techniques based on flexible, modified standard trays and sectioned trays have been proposed [1–6]. We present here a case of prosthetic rehabilitation for the patient with congenital oro-nasal defect with an interim prosthesis.

Case Report

A 7 year old boy reported to the department of prosthodontics, with severe mid-facial hypoplasia with oro-nasal defect. The chief complaint of the patient was disturbed speech, regurgitation of food and unaesthetic appearance. The patient had already undergone surgery for upper lip reconstruction, but nasal reconstruction was planned after 2 years. It was advised to maintain the patency of the nasal cavity with a prosthesis which would prevent its collapse. Till that time he was to be prosthetically rehabilitated by oro-nasal prosthesis obturating the oro-nasal defect. Two possible treatment options for the case were, first only a nasal acrylic prosthesis with oral extension could have been given. Second treatment option was a nasal prosthesis obturating the oro-nasal defect and overlay partial denture for correction of dental malocclusion. To enhance the esthetic as well as to prevent psychological and social trauma to the patient, second treatment option was opted.

On extra-oral examination, there was gross disfigurement of middle third of the face (Fig. 1). Intra-oral examination showed a large oro-nasal defect in pre-maxillary region with malocclusion (open bite) and carious left maxillary deciduous canine and molar teeth. The oro-nasal defect resulted in a communication between the oral and nasal cavities (Fig. 2). The main objective was to record

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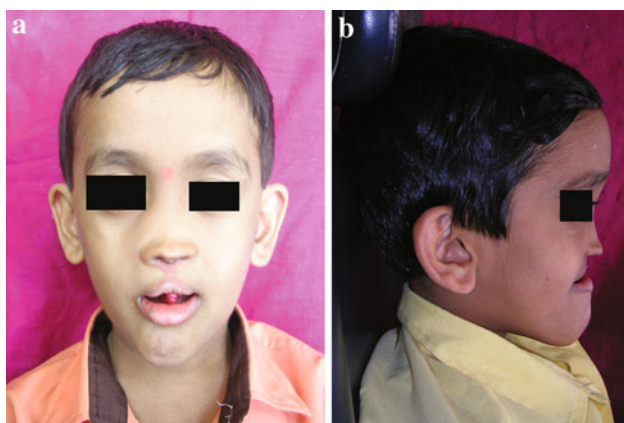


Fig. 1 Extra-oral pre-treatment photographs with surgical pack. **a** Front view, **b** lateral view



Fig. 3 Impression of the nasal defect which was being processed



Fig. 2 Intra-oral view of the defect



Fig. 4 Acrylic nasal prosthesis having orientation grooves placed in the defect

the area of the defect accurately and to provide the patient with an interim prosthesis which would facilitate closure of the intraoral defect, improving swallowing, phonetics, maintaining the patency of the nasal cavity as well as overcoming the psychological trauma. It was decided to provide a removable acrylic prosthesis which would obturate oro-nasal defect and also serve as an overlay partial denture.

Treatment Procedure

Restoration of carious left maxillary deciduous canine and molar teeth was done. Preliminary impression of the nasal defect was made with a medium fusing modeling plastic impression compound (Y-Dent Impression compound, MDM Corporation, New Delhi, India) (Fig. 3). It was then acrylized by using heat cure polymerizing resin (Lucitone 199, Dentsply, York division, Pa.). As the path of insertion and removal was different for nasal defect and maxillary

arch, it was decided to record it by a sectional impression method. Acrylic nasal prosthesis which was approximately 6 cm in length having orientation grooves was placed in the defect (Fig. 4). Impression of the maxillary dentate arch along with the nasal prosthesis was recorded with irreversible hydrocolloid (Tropicalgin; Zhermach Inc. products, California). It was removed separately from the mouth (Fig. 5), assembled outside the mouth (Fig. 6) and then it was poured with dental stone (Kalastone; KalaBhai Pvt., Mumbai, India.). Cast was sectioned bilaterally at canine region for easy removal and placement of the pattern without breakage of the working cast (Fig. 7). Minimal palatal coverage was planned to facilitate easy placement and removal of the prosthesis, which also avoided need for sectional prosthesis.

Acrylic nasal prosthesis was trimmed according to contour of the adjacent tissues. Wax-up and teeth arrangement was done on the cast. After trimming, due to inadequate grip of the acrylic portion, wire loop was



Fig. 5 Sectional impression



Fig. 8 Try-in of the waxed-up denture

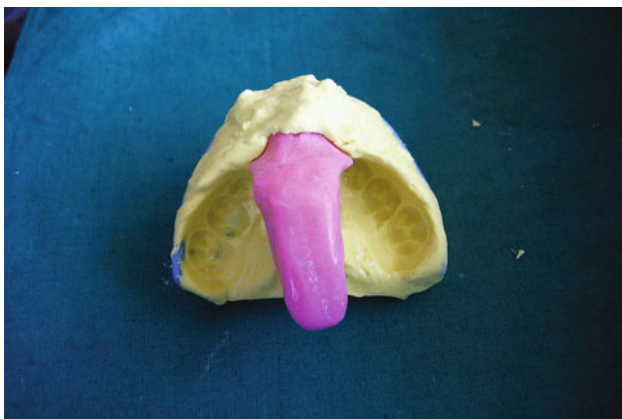


Fig. 6 Assembled sectional impression



Fig. 9 Patient with interim prosthesis. (Intra-oral view)

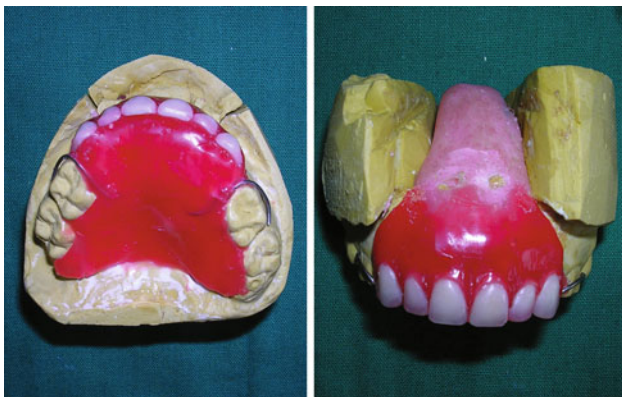


Fig. 7 Waxed-up denture over sectioned cast bilaterally at canine region

incorporated in the acrylic nasal prosthesis only at the stage of trial for easy removal of the prosthesis and to avoid accidental slippage of the prosthesis inside the nasal cavity. Double wire loop was prepared such that the ends were tugged inside the holes drilled in the acrylic prosthesis to prevent trauma and irritation to the soft tissue. Try-in was

carried out in patient's mouth (Fig. 8). After trial, wire loop was removed. After acrylization, external characterization was carried out in the presence of the patient, which was followed by finishing and polishing (Figs. 9, 10). The prosthesis could be easily seated by slight antero-posterior rotational path of insertion. The patient was given training for how to wear the prosthesis and about its maintenance. Recall was done after 24 h, followed by weekly recalls for 1 month. Monthly recalls were done for 2 years till the nasal reconstruction surgery was performed.

Discussion

Congenital anomalies of maxillae may result in a communication between the oral and nasal cavities that causes difficulty in swallowing, nasal reflex, unintelligible speech and unaesthetic appearance. Along with this, it can also be psychologically debilitating to the patient. While mandibular growth is essentially normal in cleft patient, maxillary growth is restricted in a downward and forward vector



Fig. 10 Patient with interim prosthesis (Front view)

when the cleft involves both the primary and secondary palates, exhibits a restricted maxillary arch with an anterior open bite [7]. The collective efforts of maxillofacial surgeon and prosthodontist have given these physically and psychosocially incapacitated patients some level of social acceptance. It is responsibility of the prosthodontist to restore the lost esthetics, function and speech to normal or near normal and provide a prosthesis which should be simple to handle, easy to maintain, light in weight and convenient for future adjustments.

Ohkubo [8] described a sectional stock tray system for making preliminary impressions which may be used for individual dental arches as well as for patients with microstomia or constricted oral openings. Benetti [9] described the fabrication of a collapsible maxillary removable complete overdenture using a sectional impression tray technique and a custom-made palatal hinge mechanism for a partially edentulous woman with microstomia resulting from scleroderma to assist the patient in removing the prosthesis. Geckili [10] described a modified impression procedure and a method of fabricating a 2-piece collapsible denture for a patient with limited oral opening as a result of the resection of a precancerous lesion on the

maxillary lip which enabled the patient to place and remove the denture.

In the present case report though the mouth opening was adequate, sectional impression was made to record nasal defect and maxillary dentate arch together which were having different path of placement and removal. Single prosthesis was given to rehabilitate nasal as well as orodental defect by providing minimal distopalatal extension of the prosthesis. Thus, need for sectional prosthesis was avoided. The remaining natural teeth also helped in retention and need to be evaluated for restorative and periodontal requirements periodically.

Polymethyl methacrylate resin used for making a temporary prosthesis during the period of healing and wound organization with the advantage as non invasive, cost effective, tissue tolerant, aesthetic, comfortable to use and easy to clean. The nasal prosthesis made for this patient had good esthetics and went unnoticed in public allowing him to go about life without drawing attention to his oronasal defect.

References

1. Whitsitt JA, Battle LW (1984) Technique for making flexible impression trays for the microstomic patient. *J Prosthet Dent* 52:608–609
2. Moghadam BK (1992) Preliminary impression in patient with microstomia. *J Prosthet Dent* 67:23–25
3. Luebke RJ (1984) Sectional impression tray for patient with constricted oral opening. *J Prosthet Dent* 52:135–137
4. Dhanasomboon S, Kiatsiroj K (2000) Impression procedure for a progressive sclerosis patient: a clinical report. *J Prosthet Dent* 83:279–282
5. Mirfazaelian A (2000) Use of orthodontic expansion screw in fabricating section custom trays. *J Prosthet Dent* 83:474–475
6. Cura C, Cotert HS, User A (2003) Fabrication of a sectional impression tray and sectional complete denture for a patient with microstomia and trismus: a clinical report. *J Prosthet Dent* 89:540–543
7. Beumer J, Curtis AT, Marunick MT (1996) Maxillofacial rehabilitation: prosthodontic and surgical considerations. Ishiyaku Euro America, Inc, St. Louis, p 360
8. Ohkubo C, Hosoi T, Kurtz KS (2003) A sectional stock tray system for making impressions. *J Prosthet Dent* 90:201–204
9. Benetti R, Zupi A, Toffanin A (2004) Prosthetic rehabilitation for a patient with microstomia: a clinical report. *J Prosthet Dent* 92:322–327
10. Geckili O, Cilingir A, Bilgin T (2006) Impression procedures and construction of a sectional denture for a patient with microstomia: a clinical report. *J Prosthet Dent* 96:387–390