PROSTHETIC MANAGEMENT OF A UNILATERAL CLEFT PALATE PATIENT
A CLINICAL REPORT

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ABSTRACT

Cleft lip and palate is a congenital deformity that is associated with maxillary discrepancies along with dental anomalies. Patients who have not received treatment early in life are the most challenging to treat prosthetically later in life. These patients can be managed prosthetically by obturator prosthesis. This article reviews the management of cleft palate with a closed hollow bulb obturator prosthesis and the steps involved in its fabrication.

Key words: Unilateral cleft lip and palate, Maxillary hollow bulb obturator , functional and aesthetic corrections.

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Introduction

Cleft lip and palate (CLP) is a congenital deformity that is associated with maxillary sagittal, transversal, and vertical discrepancies along with dental anomalies. It is characterized by features such as deficient midface development resulting in a class III tendency, severe maxillary transverse deficiency, alveolar cleft, hypodontia, hyperdontia, and transpositions[1]. CLP patients might also have decreased facial and dental esthetics, resulting in low self-confidence and difficulties in social interactions leading to psycho-social problems[2,3].

Conventional treatment for cleft palate correction includes an interdisciplinary approach involving surgical, orthodontic, and prosthetic and other specialties to obtain functional and esthetic outcomes. Contemporary treatment concepts lay emphasis on early surgical corrections which can improve speech and hearing functions to a considerable amount[4]. Patients who have not received surgical or orthodontic care early in life are the most challenging patients to manage prosthetically later in life[5].

These patients can be prosthetically managed by obturator prosthesis replacing the missing teeth and compensating the tissue deficiencies that interrupt the continuity of the dental arch[6,7].The obturator prosthesis facilitates speech and deglutition by replacing deficient tissues, reduce nasal regurgitation and hyper nasal speech, and improve articulation, deglutition, and mastication. This article discuss about the management of a unilateral cleft palate patient with a closed hollow bulb obturator prosthesis.

Clinical Report

A 34-year-old lady was referred to the Department of Prosthodontics for rehabilitation of a cleft palate defect. The patient's history indicated a congenital cleft lip and palate defect. Patient gives history of cleft lip surgery in early childhood and had not undergone any treatment for cleft palate management.

On examination a unilateral cleft on left side involving the alveolar arch and the entire hard and soft palate was noticed (Fig 1A, 1B). Only teeth present on the maxillary arch was 11, 13, 23, and 25. The edentulous alveolar arch was high rounded with mild bilateral undercut in the maxillary tuberosity region. Mandibular arch was partially edentulous with missing 36, 37, 46, and 47. She had deep overbite, anterior cross bite relationship and had a mouth opening of 34 mm.

The case was discussed and decided to rehabilitate with acrylic maxillary hollow bulb obturator engaging the remaining natural abutment teeth and mandibular removable partial denture prosthesis due to financial constraints. The impression was made with alginate (Tropicalgin, Zhermack) and impression compound (Rolex Impression Composition; Ashoo Sons) using metallic perforated stock tray (Fig 2). The defect area was initially molded with impression compound on the stock tray in order to slightly engage the undercuts on lateral wall of the defect and was extended to half the depth of the cleft. The roof of the defect was then packed with a gauze piece and an alginate impression was made with the stock tray on which the impression compound was molded. The cast was then poured with type III gypsum(Kalstone; Kalabhai Karson Pvt. Ltd.) (Fig 3).

Temporary denture base was fabricated with shellac base plate (Supernal, S.D. Dental Corporation)extending the entire cleft depth. Overbite correction was done during jaw relation record and 2mm of vertical dimension of occlusion was restored. Teeth arrangement was done maintaining anterior cross bite relationship. Try-in was done which was found acceptable by the patient. Circumferential wrought wire clasp was made with 19 gauge stainless steel orthodontic wire on abutment teeth 13 and 25 and the denture was then waxed up for processing.

The denture was fabricated using light pink heat polymerizing acrylic resin (DPI Heat Cure; Dental Products of India) with compression molding technique involving a long polymerization cycle (74°C for 8 hours). The denture was then retrieved which was of open hollow design. The defect area was then filled with table salt and was then covered with light pink self-polymerizing acrylic resin(DPI Cold Cure; Dental Products of India). Upon completion

of the polymerization a small hole was made on the covered region. Water was then syringed through the hole and the saline was then flushed out. The hole was then sealed with self-polymerizing resin turning the obturator prosthesis to a closed hollow bulb design (Fig 4A, 4B). The prosthesis was then inserted in the patient and the retention, stability, esthetics, and occlusion was verified (Fig 5A - 5D). Periodic recall was made on a weekly basis and the necessary corrections were made. A marked improvement in mastication, deglutition, phonetics, and esthetics was noticed and appreciated by the patient (Fig 6A, 6B).

Discussion

An obturator is a maxillofacial prosthesis that is used to close the cleft defect and make separation between oral and the nasal cavities. The prosthesis option can vary from a simple removable partial denture replacing missing teeth and supporting tissues to tooth or implant supported overdentures[5]. Later offers better treatment outcome with respect to the prostheses function, facial esthetics, and patient acceptability. But the treatment is expensive, time consuming, and requires natural abutment teeth at critical positions and sufficient interarch space. A cast removable partial denture offers better stability, retention, and functional outcome[8]. However the treatment is more laborious and expensive.

The design of an obturator is to engage the remaining natural teeth and tissue-bearing areas to optimize retention and stability[9]. Increasing the lateral wall height, and extending the prosthesis into the anterior nasal aperture can enhance the retention and stability of the prosthesis at the expense of its weight and bulkiness[10]. Hollowing the obturator can significantly reduce the weight of the prosthesis. Both open and closed hollow obturators allow for the fabrication of a lightweight prosthesis that is readily tolerated by the patient while effectively extending in to the defect. The closed design can prevent fluid and food collection, reduce air space, and allow for maximum extension[11].

An acrylic hollow bulb obturator was planned in this patient because of financial constraints. The treatment plan pose a dilemma of reduced prosthesis retention, stability, and functional outcome. But the treatment option is more ecocnomical, and less time consuming.

Summary

This clinical report describes the prosthetic rehabilitation of a patient with a unilateral cleft palate that have not been treated in childhood. The patient has been rehabilitated with an acrylic hollow bulb obturator prosthesis that has improved her mastication, deglutition, phonetics, and esthetics. The treatment offers an economical alternative in the management of cleft palate in adults.

Fig 1A. Intra oral view showing palatal defect

Fig 1B. Intra oral view showing anterior extend of the defect

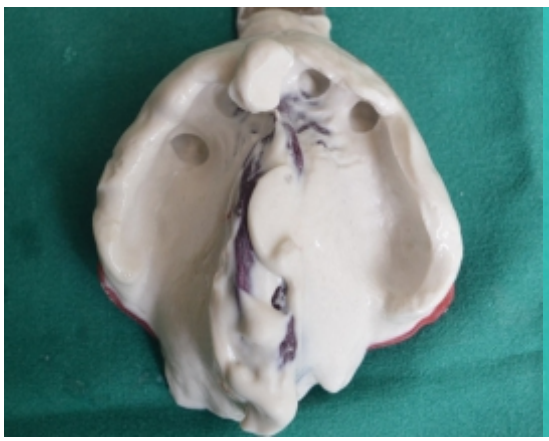

Fig 2. Impression

Fig 3. Master cast

Fig 4A. Hollow bulb obturator: cameo surface

Fig 4B. Hollow bulb obturator: intaglio surface

Fig 5A. Prosthesis insertion: Occlusal view

Fig 5B. Prosthesis insertion: Frontal view

Fig 5D. Prosthesis insertion: Left lateral view

Fig 5C. Prosthesis insertion: Right lateral view

Fig 6A. Pre-operative view

Fig 6B. Post operative view

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