

Prosthetic Rehabilitation of Completely Edentulous Unrepaired Cleft Palate Patient with Implant Supported Hader Bar and Clips: A Case Report

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ABSTRACT

Prosthetic rehabilitation of an edentulous cleft lip and palate patient with a combined hard and soft palate defect is a great challenge, due to the lack of retention of the obturator prosthesis as a result of its weight and the inability to obtain a border seal. Dental implants improve the retention, stability, and occlusal function of prostheses when used in carefully selected cleft lip and palate cases. This clinical report presents an edentulous unilateral cleft lip and palate patient who has hard and soft palate defects and an atrophied maxilla, treated with an implant-supported speech-aid prosthesis. Prosthetic rehabilitation of an edentulous cleft lip and palate patient with a combined hard and soft palate defect is a great challenge, due to the lack of retention of the obturator prosthesis as a result of its weight and the inability to obtain a border seal. Dental implants improve the retention, stability, and occlusal function of prostheses when used in carefully selected cleft lip and palate cases. The prosthetic rehabilitation of edentulous patient with unrepaired cleft palate poses a great challenge due to both hard and soft tissue defect compromising retention, support and stability of the obturator due to inability to obtain border seal and heavy weight. In carefully selected patient use of osseointegrated implant along with the bars and clips supporting and retaining maxillary overdentures on implants play a significant role in their efficacy. This clinical report presents an edentulous unilateral cleft palate patient treated with an implant-supported Hader bar and clips.

Key words: Cleft Palate, Obturator Prosthesis, Implant, Hader Bar and Clip

INTRODUCTION

The treatment of the cleft lip and palate (CLP) is a long-term process which is comprehensive and involves the efforts of a team of specialists over a time span ranging from birth up until early adulthood¹. During this treatment period, many patients benefit from alveolar bone grafting and orthodontic realignment and

require little or no prosthodontic treatment.² A prosthesis is planned as the final restoration in some cases those who have not undergone the alveolar graft procedure (or this has been unsuccessful), or has been unsuitable due to the extent of their defect. Such patient presents the greatest prosthodontic challenge. Particularly, if the patient is edentulous, retention of the obturator prosthesis is difficult due to the weight of the prosthesis and the inability to obtain a border seal.³ Osseointegrated implants have provided new alternative, allowing clinicians to provide teeth for patients who cannot be rehabilitated satisfactorily by conventional prosthetic techniques.^{4,5} Dental implants improve the retention, stability, and occlusal function of the prosthesis when used

Conflict of Interest: None

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in carefully selected cases. This case report describes prosthetic rehabilitation of edentulous unilateral cleft palate patient treated with an implant-supported Hader bar and clips.

CLINICAL REPORT

A 53-year-old man with unrepaired cleft palate was referred to the department of Prosthodontics, Bir Hospital for prosthodontic rehabilitation. The intra oral examination revealed unrepaired cleft of hard and soft palate (Fig 1). Patient underwent surgery for cleft lip earlier. He presented with gross caries and tooth mobility in the remaining teeth with hyper nasal speech and unsatisfactory esthetic appearance. Extraction was carried out for the mobile teeth.

At the initial visit, preliminary impressions were made with the help of stock tray (Samit, New Delhi, India) (Fig 2A), custom tray was fabricated on recovered cast using chemically cured acrylic resin with extended palatal portion to support the impression tray on the defect (fig 2.b). Primary impression was taken with alginate (Coltene, India) to record the tissues and the defect and primary cast fabricated (Fig 2C,2D).

SURGICAL ASPECT

CBCT radiograph was done for implant planning (Fig 3). Four implants 8 mm in length, 4.5-mm-diameter (Blue sky, Bredent implant) were placed in the maxillary alveolus (Fig 4,5). Six months later, the patient required a second-stage surgery for implant uncovering and healing abutment placement (Fig 6).

PROSTHETIC ASPECT

After two weeks, a final impression was made with impression copings for a direct impression technique using an autopolymerizing acrylic custom tray and polyvinylsiloxane impression material after applying tray adhesive (Fig 7).

Implant analogs were inserted in their respective places, and a final cast was poured in improved stone. On the master cast, anatomic abutments were placed on each implant analog. Zig trial of abutment with pattern resin was done to verify the accuracy of impression (Fig 8).

Burnout plastics for plastic bars were cut and adjusted and they were cast. Bar units were tried in the patient's mouth until a passive fit was achieved between bar abutments and implants (fig 9).

Afterward, clips were adjusted to the bars. A custom-made impression tray was fabricated for a final impression of the upper arch. Bar units were placed in their places in the mouth and clips were attached to the metal framework with autopolymerizing acrylic resin (Fig 10).

Impression compound was used to copy the palatal defect. The velopharyngeal portion of framework was molded by adding small increments of the compound each time and making the patient move his head in a circular manner from side to side, to extend his head as far forward and backward as possible, and to say 'ahh' and swallow (Fig 11).

The final impression was made functionally using light body PVS impression material. The impression was poured in type III stone, and the altered cast was recovered (Fig 12).

The base part of the prosthesis was processed with heat-polymerizing acrylic. Mandibular denture was fabricated in conventional way (Fig 13).

The prostheses were then inserted in the patient's mouth, and the extensions, speech, and occlusion were evaluated. The superior extension of the maxillary prosthesis was checked using pressure indicating paste and further adjustments were done (Fig 14, 15, 16).

There was a considerable improvement in aesthetics (Fig 17). The patient was trained in oral hygiene and was instructed in the specific care of his new dentures. The prostheses were

delivered to the patient, and the checkups were done at the first week, second week, and first month following insertion of the prosthesis.



Figure 1: Intraoral photograph of maxilla and mandible

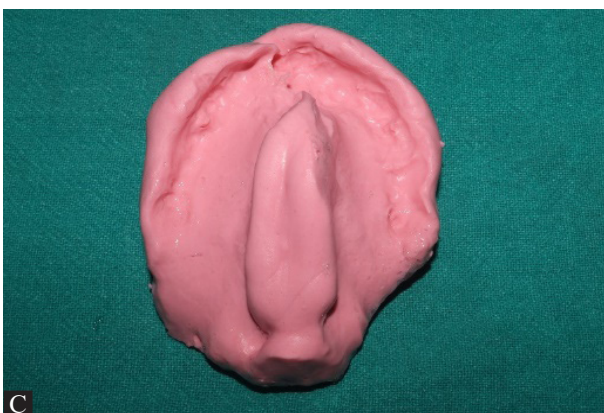


Figure 2: Primary Impression of maxillary arch with defect; 2A: Preliminary impression taken with stock tray, 2B: Custom tray fabrication with extended palatal portion, 2C: Primary impression taken using alginate impression, 2D: Primary cast fabricated

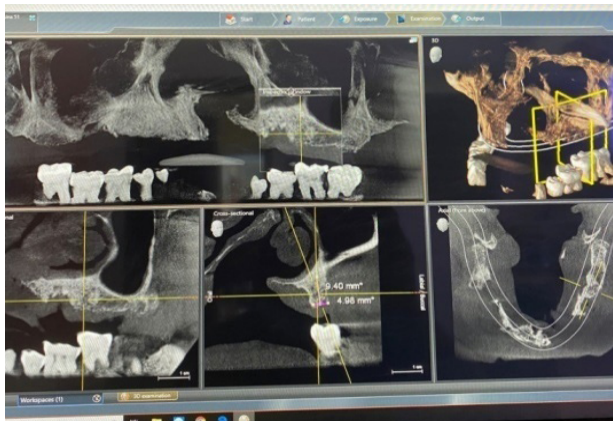


Figure 3: CBCT radiograph

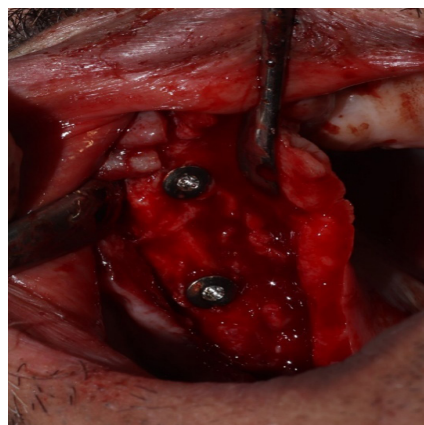


Figure 4: Implant surgery

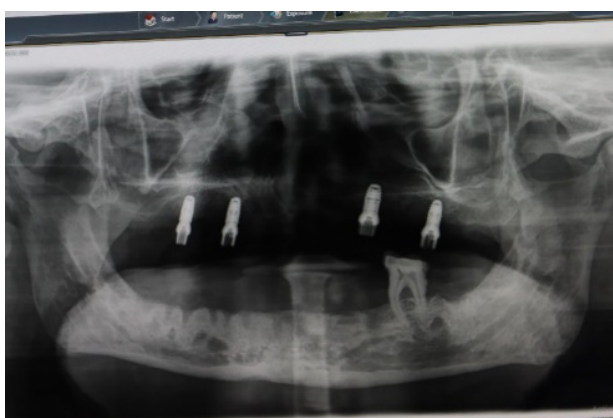


Figure 5: OPG radiograph showing implant placement



Figure 6: Healing abutment placement



Figure 7: Final impression using open tray impression coping



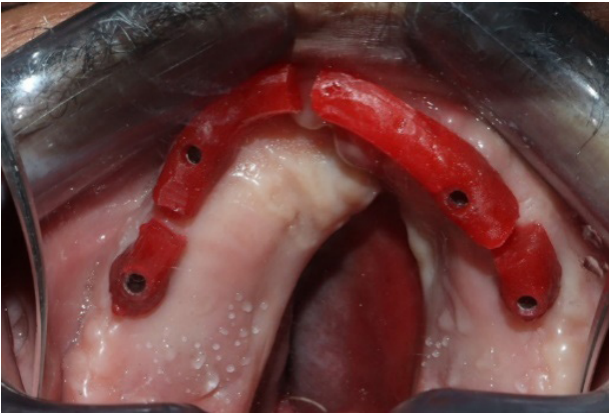


Figure 8: Zig trail of abutment with pattern resin

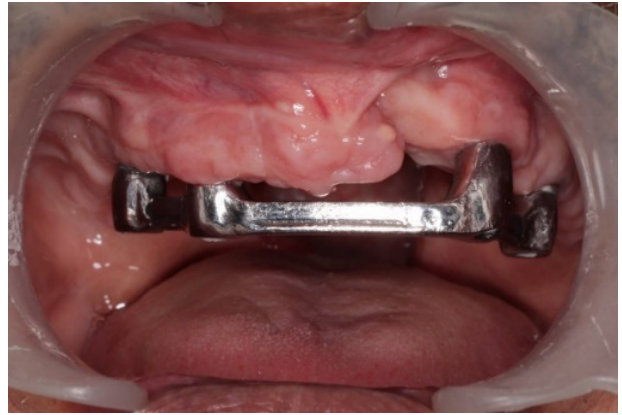


Figure 9: Hader bar try in

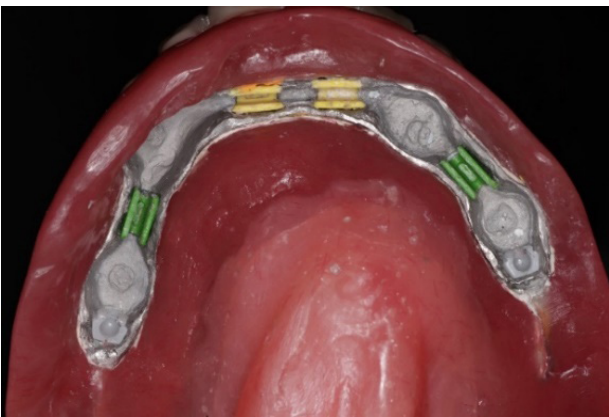


Figure 10: Intaglio surface of the denture with retention clips

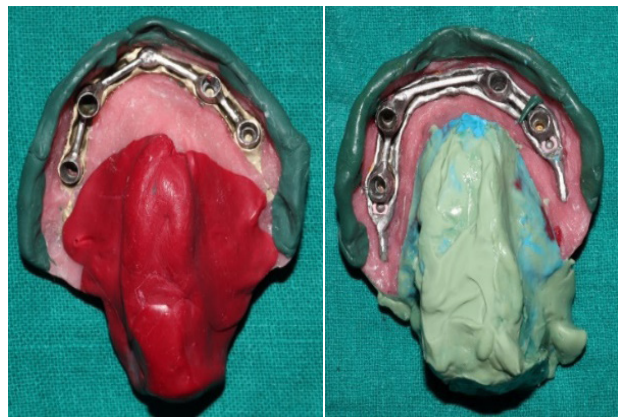


Figure 11: Border molding and final impression of Palatal defect area



Figure 12: Altered cast technique



Figure 13: Anterior and posterior try in



Figure 14: Completed maxillary prosthesis

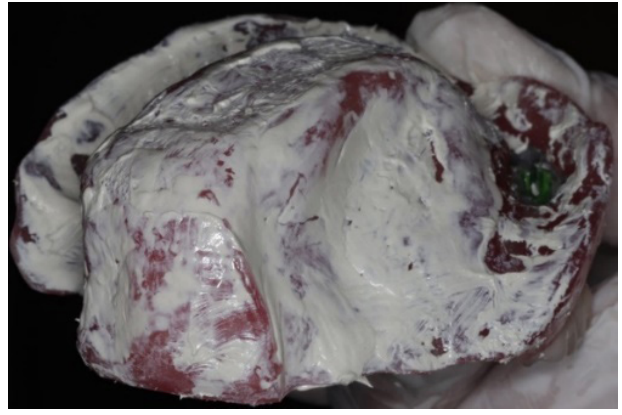


Figure 15: Using pressure indicating paste to check overextension



Figure 16: final denture



Figure 17: Extraoral frontal view, pre and post insertion of obturator

DISCUSSION

Prosthetic treatment of edentulous cleft palate patients presents both psychological and technical challenges.⁶ To improve speech, deglutition, mastication, and appearance the maxillary obturator must have adequate retention and stability.⁷ Osseointegrated implant are very

effective in providing such requirements; although placement of them in the maxilla may present a surgical challenge in cleft palate patients. Due to the difficulty in constructing well-fitting conventional dentures for such patients and the relatively compromised nature of the prosthesis, retentive features such as the

bars and clips supporting and retaining maxillary overdentures on implants play a significant role in their efficacy.⁸In the present case, hader bars and clips were used. Implants with bars provided efficient support and retention for the prosthesis of an edentulous cleft palate patient. Prosthetic rehabilitation of soft palate disorders and defects has relied traditionally on functional contouring of prostheses using functionally adapted impression materials. In this case, modeling impression compound was used in functional contouring of the palatal defect and VP portion. Light body PVS material was added to it for making a final impression. Harrison³ added impression wax to the compound surface, polyvinylsiloxane and polyether also have been considered appropriate for border molding procedures⁹. Different impression materials such as polysulfide and polyvinylsiloxane⁴ have been used in final impressions of CLP patients. With these materials, the dimensional accuracy is usually time dependent. In this case, the final impression for implants was made with polyvinylsiloxane impression material. The acrylic resin extensions are functionally formed so that the soft tissues make intimate static contact but do not tend to displace the obturator.¹⁰ The patient demonstrated a significant improvement in esthetics and speech ability.

CONCLUSION

A well-planned prosthetic therapy will result in satisfactory function and aesthetics, providing alleviation of the deformities. In the presented case report, use of Hader bar and clips on implant supported obturator resulted in improvement in mastication, speech, and velopharyngeal function.

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