



MANAGEMENT OF MAXILLARY DEFECT WITH A COMBINED PROSTHESIS OF HOLLOW BULB OBTURATOR AND SEMI PRECISION ATTACHMENTS - A CASE REPORT

Prosthodontics

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ABSTRACT

The prosthetic rehabilitation of a patient with maxillary defect is a very challenging task. Obtaining proper retention when almost half the dentition along with the supporting bone is missing is difficult to say the least. Proper knowledge of the anatomy of both the structures lost in resection as well as the remaining portion helps in fabrication of an effective prosthesis. This article describes the management of a maxillary defect case with semi precision attachments enhancing the retention of the obturator prosthesis.

KEYWORDS

Semi precision attachments, definitive hollow bulb obturator, combined prosthesis.

Introduction

Surgical resection of the maxilla results in oro-antral communication with nasal regurgitation, nasal speech and inability to eat with poor facial appearance. These multi-faceted problems affects the patient psychologically¹. Lack of proper nutrition leads to deficiencies and subsequent loss of immunity. This further paves the way for secondary infections and thereby the patients are stuck in a malicious cycle. With the help of an obturator prosthesis, the maxillary defect is closed to improve deglutition, articulation, pronunciation, facial appearance and to support the orbital contents². The patient's dependence on feeding tube gets reduced and thus overall health is improved. In extensive maxillary defects the weight of the obturator prosthesis is increased, resulting in poor retention and insecure mental status of the patient. The present article describes the rehabilitation of a patient with Aramany Class 1 defect³ by a combined prosthesis of a hollow bulb obturator with extra coronal semi precision attachments.

Case report

A 30-year-old female patient reported to the Department of Prosthodontics, Tamil Nadu Government Dental College and Hospital with a chief complaint of ill-fitting and loose maxillary facial prosthesis with poor esthetics. The patient had a history of mucoepidermoid carcinoma of the right palate and maxillary antrum. Right maxillectomy and later radiotherapy done. She had a rehabilitation with a definitive acrylic maxillary obturator. On examination, the patient had a Class I Aramany defect with loss of all teeth in the right upper first quadrant and missing 26 in the second quadrant. The patient's old acrylic obturator was heavier with direct retainers made of stainless steel wire on abutments 21 and 27. The obturator was less retentive with poor esthetics (Fig 1 & 2).



Fig 1: Maxillary Defect



Fig 2: Old Obturator

A combined prosthesis of a cast partial hollow bulb obturator with castable extra coronal precision attachments were planned for better retention and esthetics. 21, 22, and 25 were selected as abutments to receive the male part of semi precision attachments. The female part was planned to be incorporated in the cast partial denture framework

with a closed horse shoe design.

Procedure

Tooth preparation was done in 21, 22 and 25 to receive the metal ceramic crowns. The impression was made of polyvinyl siloxane material using dual impression technique and a cast poured. After proper diligence OT cap and OT strategy extra coronal castable attachments of Rhein 83 were selected Wax patterns fabricated for 21 and 22 with a connector and a single crown pattern on 25. Using a mini parallelometer the OT strategy castable vertical attachment was attached mesial to 21 and OT cap attached distal to 25 (Fig 3). Once casting procedure completed, ceramic layering of the crowns was done and tried in the patient's mouth for fit and occlusion (Fig 4). The impression procedure for cast partial denture framework done. The bulb part recorded with a wash impression of zinc oxide eugenol paste over the impression compound. The crowns were seated over the abutments, and an irreversible hydrocolloid impression was made to pick up the bulb along with the crowns and cast poured (Fig 5). A cast partial denture framework pattern with a closed horseshoe design was fabricated on the refractory cast. The resilient pink cap placed over the male attachments before duplication and the female housing incorporated in the partial denture framework. The partial denture framework completed, and the framework trial done after luting the crowns with temporary cement (Fig 6).



Fig 3: Wax pattern & castable Attachments

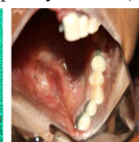


Fig 4: Try in of crowns



Fig 5: Impression picked with crowns and bulb



Fig 6: Metal try in of CPD

Occlusal rims made on the metal framework, and the jaw relation recorded. Wax try in was done, and final wax-up completed. The bulb portion was processed hollow using the lost salt technique. A thin layer of acrylic at the dough stage was placed in the defect. The bulb portion is now filled with salt and the remaining acrylic material placed over the salt and the packing completed. After processing, the salt was removed from the obturator after making a small hole in the bulb portion and immersed in hot water. The obturator was tried for fit and occlusion. The metal ceramic crowns with male attachments luted with type I GIC cement, and the rubber housing (pink) fixed to the female portion of the obturator. The patient is now satisfied and comfortable with an obturator of lesser weight, better retention, and better esthetics. (Fig 7&8).

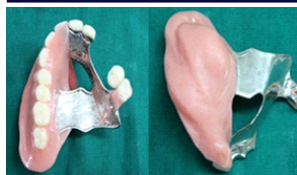


Fig 7 :Processed obturator with crowns and attachments



Fig 8:Final obturator with good esthetics

DISCUSSION

Management of multiple problems that arise during fabrication of complex maxillofacial prosthesis requires careful deliberation and assessment. In this case the main challenge was to provide adequate retention for the prosthesis. Readily available attachments are known as precision attachments and those fabricated in laboratory are semi precision attachments. They are used to obtain the support of existing teeth. The attachments consist of a retainer with a male part which is a metal receptacle on a contoured abutment crown and a female part which is attached to a removable prosthesis or a pontic⁴. The attachments are designed to replace occlusal rest, bracing arm, and retaining arm of the conventional clasp retained partial denture. They provide retention, stability and support for the removable partial denture. Precision attachments, very like their name offer precise and effective solutions.⁵

Charkawi HG et al⁶ evaluated and quantified changes in retentive ability and weight change over time. They postulated that precision attachment protects the abutment teeth and the supporting bone when associated with at least two splinted abutments. Here we have splinted the abutments 21 and 22 to distribute the stresses when using extra coronal attachments. Because excessive prosthesis weight causes retention and stability problems obturator should be made hollow. This improves cantilever mechanics of the suspension and prevents overloading of remaining supportive structures⁷. Although many methods have been detailed in literature^{8,9}, a simple method of lost salt technique was followed in this case to shorten the laboratory steps. Prabhakar B. Angadi et al¹⁰, review of precision attachments states that the extra coronal type of attachment occupies the space immediately next to abutment tooth, which is precisely where a replacement tooth should ideally be positioned, is a disadvantage. Stupendous choice of proper attachment for the available space will overcome this. For the long-term success of this obturator prosthesis, it is important that the patient maintains proper oral hygiene and follows post-operative instructions judiciously. Regular review visits to change worn out rubber housing is also stressed to the patient

Conclusion

Patients with maxillary defects have deep seated psychological trauma. It is also difficult to fabricate a prosthesis with adequate retention. The selection of suitable retentive aids for the existing clinical condition depends on the availability of the latest tools and the clinician knowledge to utilize it. The case report presented here is rehabilitated with a combined prosthesis that included castable attachments for enhanced retention. This helped the patient in her overall recovery and regained her ability to eat properly. She regained her confidence to lead a life with renewed vigour and zest.

REFERENCES

1. Bhat V. A close-up on obturators using magnets: Part II. J Indian Prosthodont Society 2006;6: 148-153
2. Wang RR. Sectional prosthesis for total maxillectomy patients: a clinical report J Prosthet Dentistry 1997;78(3):241-244
3. Aramany MA. Basic principles of obturator design for partially edentulous patients. Part I: classification. 1978. J Prosthet Dent 2001; 86:559-61.
4. The Glossary of Prosthodontic Terms. 9th ed (GPT-9) J Prosthet Dentistry May 2017, Vol 117, Issue 5, Supplement pages C1, e1-e105
5. Harsh Patel et al. Use of precision attachment and cast partial denture for long-span partially edentulous mouth-A case report, International Journal of Applied Dental Sciences 2014; 1(1): 22-25
6. el Charkawi HG, Wakad MT. Effect of splinting on load distribution of extra coronal attachment with distal extension prosthesis in Vitro. J Prosthet Dent 1996;Sep 76(3):315-320
7. Desjardins RP. Obturator prosthesis design for acquired maxillary defects. J Prosthet Dent. 1978 Apr; 39(4):424-35.
8. Robin Mathai Joseph. Hemi-maxillectomy rehabilitation using simple hollow bulb obturator, The Journal of Indian Prosthodontic Society; october 2009; vol 9; Issue 4; p230-233
9. Bhasin AS et al. Rehabilitation of Patient with Acquired Maxillary Defect, using a Closed Hollow Bulb Obturator. Indian J Palliat Care. 2011 Jan; 17(1):70-3.
10. Prabhakar B. Angadi et al. Precision attachments; applications and limitations, Journal of Evolution of Medical and Dental Sciences; December-2012/Volume 1/Issue 6 : 1113-1121