

Clinical Report

Rehabilitation of a compromised maxillectomy defect with a definitive hollow bulb obturator

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The maxillofacial patient can experience unique alterations in the normal oral / craniofacial environment because of maxillofacial trauma, congenital defects, developmental anomalies and neuromuscular diseases. In general, there is reduced capacity for residual teeth and tissue to provide optimal cross arch support, stability and retention. The design must take into account the tooth-tissue support considerations and the impact of the altered environment on prosthesis support, stability and retention. The present article is a case report of the rehabilitation of a compromised Aramany class II maxillectomy defect with a definitive hollow bulb obturator.

Key words: Definitive obturator, hollow bulb obturator, maxillectomy defect

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INTRODUCTION

The partially edentulous maxillofacial patient, in whom there is extensive loss of supporting bone, usually has had extensive surgery for a tumor or traumatic jaw injury. In many instances, the patient has such a gross jaw defect that a complete denture would be unmanageable, but a prosthesis stabilized by the remaining teeth would be functionally adequate. However, the problems of obtaining satisfactory denture support are greatly magnified.^[1] In all partial denture treatment, we strive to preserve the health of the remaining teeth by not subjecting them to stress exceeding their physiologic limit. This is a greater problem in maxillofacial patients in whom the ridge tissue is more resilient and displaceable than that of even a badly resorbed ridge. The appliances must replace much lost tissue, and sometimes also support an obturator or stent. Thus the appliance itself, which may be both bulky and heavy, places considerable stress on the abutment teeth.

In the present case report a compromised Aramany^[2] class II maxillectomy defect was treated with a definitive hollow bulb obturator.

CASE REPORT

A 33-year-old female patient reported to the Department of Prosthodontics with a chief complaint of loose maxillary prosthesis and pain in her upper left posterior teeth. Her past medical history revealed that she underwent right inferior partial maxillectomy (from

2nd premolar to 3rd molar) followed by radiotherapy (60 GY/ 30 # / 6 weeks) as a treatment for mucoepidermoid carcinoma of the right palate and antrum, 12 years back. Five months later, a definitive obturator had been delivered replacing teeth 15, 16 and 17. Teeth 14, 24, 25, 26 and 27 were used as abutments. The patient developed decay in her abutment teeth 25, 26 and 27 five years later. Teeth 25 and 26 were extracted and resin teeth were added to the obturator. On examination she had gross decay of teeth 27 and 28 with grade III mobility, which was confirmed radiographically [Figure 1]. Their prognosis was confirmed to be hopeless. Teeth 14 and 24 had cervical caries underneath the cast circumferential clasps. The defect was seen crossing the midline. Soft palate motion was satisfactory. Salivation was adequate. Speech was defective and hyper nasal. There was deviation of the mandible to the right on opening.

The defect was Aramany class II but was compromised by the absence of posterior teeth and by the presence of a long edentulous span on the non-defect side. The defect crossed the midline, the antero-posterior length of the prosthesis was greater, and only a few teeth were present to serve as abutments.

Treatment plan included:

- Extraction of hopeless teeth 27 and 28
- Metal ceramic restorations on teeth 14 and 24
- Definitive two-piece hollow bulb obturator replacing teeth 15, 16, 17, 25, 26 and 27

Treatment

- U/L alginate impressions were made taking care to

block out defect undercuts with petrolatum laden gauze. Diagnostic casts were obtained, following which the patient was referred to oral surgery for extraction of teeth 27 and 28 and recalled after three weeks.

- The defect was outlined on the diagnostic cast, teeth 27 and 28 were scribed off and a special tray covering the defect and the remaining teeth was fabricated using auto polymerizing acrylic resin and a uniform 2 mm wax spacer was given.
- At the three-week recall visit, the extraction site had healed satisfactorily. Teeth 14 and 24 were prepared to receive metal ceramic restorations, and rest seats were prepared on teeth 13 and 23
- The defect site was border molded and a final impression was made by the dual impression technique using additional silicone impression material [Figure 2]
- A master cast was obtained and surveyed
- Metal ceramic crowns were fabricated on abutment teeth 14 and 24; rest seats were carved in the wax pattern on a surveyor before casting, sprucing, investing and casting was done. Porcelain was fired on to the casting and the crown contour perfected on the surveyor [Figure 3].
- The master cast was then arbitrarily blocked out, duplication was done using reversible hydrocolloid and a refractory cast was obtained
- A framework was waxed onto the refractory cast. 19 gauge wrought wire clasps were incorporated in the wax pattern for abutment teeth 14 and 24 [Figure 4].
- The patient had multiple interdental diastemas where the proximal line angles were engaged to provide multiple guide planes
- The pattern was cast in base metal Co-Cr alloy and the framework obtained
- After finishing and polishing, a metal try in of the framework was done [Figure 5].
- Autopolymerizing acrylic resin was used to fabricate a temporary denture base on the framework, the defect and the edentulous span were border molded and an altered cast was obtained [Figure 6]
- A jaw relation record was taken and the new master cast mounted on a three-point articulator
- A two-piece hollow bulb design was modified where the resin teeth were incorporated in the obturator lid to obtain optimum palatal contour
- Wax up of the defect was done with 2 mm uniform thickness
- The defect was blocked out with plasticine
- Autopolymerizing acrylic was mixed and flowed onto the blocked-out area to obtain a sectional denture base making sure that uniform palatal contour was maintained
- Resin teeth were placed onto the sectional denture

base which would also double as a lid for the obturator [Figure 7]

- Flasking and curing was done separately for the lid and obturator portion
- Two sections were joined using autopolymerizing acrylic resin
- Finishing and polishing was done and the denture was delivered after occlusal adjustment [Figure 8]
- The patient's speech showed remarkable improvement
- Satisfactory fit and retention was obtained by securing the wrought wire clasps
- Her jaw movement had also improved as the cheek support had been restored
- The patient was referred to the speech therapist for further habilitation.
- Post insertion check-up was done at one week, one-month and three-month intervals and the patient has been functioning normally.

DISCUSSION

Aramany class II defect generally provides a favorable situation for prosthesis construction when sound remaining teeth are present. The defect is unilateral and anterior teeth are left intact sometimes up to the second premolar. Esthetics is not greatly compromised. The defect does not cross the midline in classical resections.

Tripodal removable prosthetic design can be planned and cross arch stabilization achieved. The prognosis improves with increase in the number of teeth, and satisfactory retention, stability and support can be expected with minimized prosthesis movement.

In the present case, classical tripodal design was not possible as there was a long span posterior edentulous space on the non-defect side. The leverage forces falling on the abutment teeth were thus magnified. A few remaining abutment teeth were present. A full palatal major connector design was used along with the use of multiple guide planes and definitive rest seats on the canine and abutment teeth. Wrought wire circumferential clasps were incorporated to minimize the horizontal forces acting on the abutments.^[1,3] The defect was aggressively engaged to obtain retention and support. The two-piece hollow bulb design was modified with resin teeth on the defect side of the lid. This further reduced the weight of the prosthesis while promoting a favorable palatal contour.

CONCLUSION

Maxillofacial defects are highly individual and require the clinician to call upon all his knowledge and experience to fabricate a functional prosthesis.



Figure 1: Pre operative intraoral view

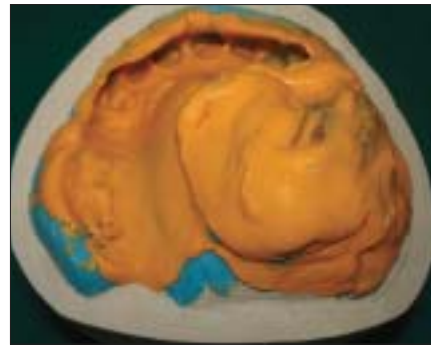


Figure 2: Final impression



Figure 3: Crowns on abutment teeth



Figure 4: Waxing up the framework on refractory cast



Figure 5: Metal try in

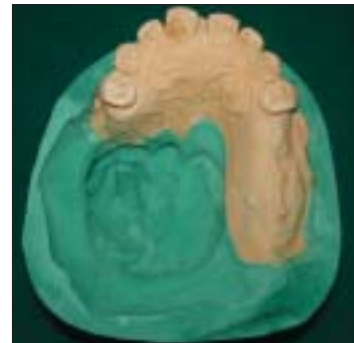


Figure 6: Altered cast

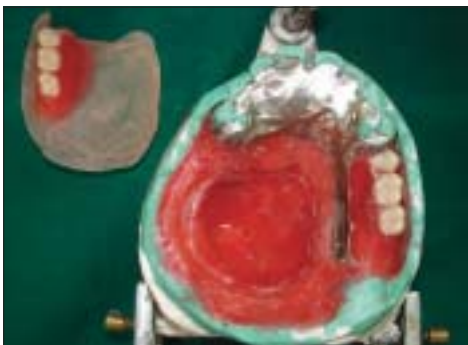


Figure 7: Sectional denture base with teeth



Figure 8: Finished prosthesis

Without a definitive prosthesis, patients are not afforded the opportunity for complete rehabilitation. There are many individual presentations and varying challenges when providing patients with prostheses for acquired palatal deficiency and the restorative dentist has to be imaginative and innovative. As with any other successful treatment, the important feature is to be aware of the principles and to stick to them.^[4]

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