OBTURATOR PROSTHESIS FOR ARMANY'S CLASS VI MAXILLARY DEFECT: A CLINICAL REPORT

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Maxillary defects are created by surgical treatment of benign or malignant neoplasms, congenital malformation and by trauma. The size and location of the defects influence the degree of impairment and difficulty in prosthetic rehabilitation. Armany's Class VI maxillary defect is rare in occurrence and rehabilitation of such patients present many challenges. Such defects preclude masticatory function, speech, deglutition and facial esthetics. These patients after undergoing the surgery are psychologically and functionally compromised; therefore multidisciplinary approach comprising psychological and prosthetic factors should be followed.

Keywords: maxillary defect, armany class VI, support, retention, obturator prosthesis.

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Maxillary defects are created by surgical treatment of benign or malignant neoplasms, congenital malformation and by trauma. Patients who have undergone extensive surgical resection of the maxilla experience dysfunctions in deglutition, mastication, and speech. A prosthesis used to close a palatal defect in a dentate or edentulous mouth is referred to as an obturator. The obturator prosthesis is used to restore masticatory function and improve speech, deglutition and cosmetics for maxillary defect patients.[1]

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Defects in the maxilla may be divided into these defects resulting from congenital malformations and the acquired defects resulting from surgery for oral neoplasms.[2]

The goals of prosthetic rehabilitation for total and partial maxillectomy patients include separation of oral and nasal cavities to allow adequate deglutition and articulation, possible support of the orbital contents to prevent enophthalmos and diplopia, support of the soft tissue to restore the midfacial contour, and acceptable aesthetic results.[1]

It is rare to have an acquired maxillary defect anterior to the remaining abutment teeth. This occurs mostly in trauma or in congenital defects rather than as a planned surgical intervention. Due to anatomic complexity of the mid-face and thereby endless potential for surgical or traumatic defect size, shape, and location, characteristics of the treatment considerations for maxillary defects present an unlimited variety of possible configurations.[3]

In this class, cross-arch stabilization is derived through a system of cross-arch bars which will provide wide distribution of support and retention from separated abutment teeth.[4]

Clinical report

A 22-year-old girl underwent a maxillectomy for undifferentiated carcinoma that constituted the en-

tire premaxillary region. She reported to the Department of Prosthodontics Kothiwal Dental College Moradabad 3 to 4 years after surgery.

On **extroral examination** facial asymmetry was evident. There was a scarring on the left side of the nose accompanied by flattening of the mid facial region on the left side. Due to wound contraction upper lip on the left side got incompetent. Left corner of the lip was also depressed. (Refer to fig. 1 and 2)

Intraoral examination reveled resected premaxilla and missing anterior teeth and posterior teeth leaving 3rd molar in the second quadrant. The surgical resection resulted in an oronasal communication (Refer to fig. 3). After the surgery, patient was free of any symptoms of disease except for the post surgical consequences. Patient was not provided with any temporary obturator.

The primary concern due to which patient reported to the Department of Prosthodontics (Kothiwal Dental College) was inability to speak, eat and unaesthetic facial appearance.

After the case history patient was provided with an interim prosthesis before final prosthesis had to be delivered.

Diagnosis

The patient presented Armany's class VI maxillary defect which included missing 11, 12, 21, 22, 23, 24, 25, 26, and 27.

Oronasal communication was evident on intraoral examination. There was depression in the left midfacial region along with lip incompetence due to wound contraction.

Treatment sequence

1. In the first appointment patient's upper and lower diagnostic impressions were made with irreversible hydrocolloid; stone cast were poured with type III dental stone.
2. Self cure special tray was made on the maxillary diagnostic cast.
3. In the second appointment using the special tray putty reline impression was made.
4. Two master casts were poured with type III dental stone.
5. One was used to fabricate the interim prosthesis and the other was used to plan for the cast partial framework design.
6. For the interim prosthesis teeth arrangement and wax up was done taking lower arch as reference.
7. In the third appointment patient was recalled for the try in appointment for minor corrections in the tooth positioning for esthetics.
8. Thereafter acrylization was done and interim prosthesis was delivered in the fourth appointment. (Refer to fig. 4)
9. Now planning for the definitive prosthesis was done.
10. Design for the cast partial is as follows:
    a. Major connector – full palatal coverage
    b. Direct retainers - circumferential clasps on the last 2 molar abutments i.e. 18, 28 and I-bar clasp on the canine.
    c. Rests – mesial rest on 28, mesial rest on 18, interproximal rest between 15, 16, cingulum rest opposing the i-bar.
11. The master cast is surveyed and height of contour is marked on to the abutments.
12. There after shape blockout, parallel blockout and arbitrary block outs were done on to the cast.
13. The blocked out cast is duplicated with reversible hydrocolloid.
14. Wax up done on the refractory cast was invested, casted and finished. (Refer to fig. 5)
15. Metal Framework try in and adjustment was done in the patient's mouth on fifth appointment.
16. Fabrication of the hollow bulb:
    a. Wax spacer was adapted in the defect with five tissue stops this formed the base of the hollow bulb.



Figure 1. Pre surgical view (frontal)



Figure 2. Post surgical view

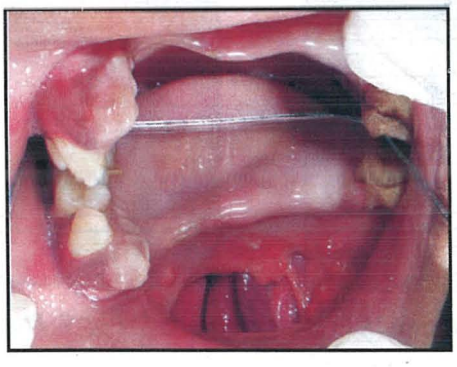


Figure 3. Intraoral defect showing oro-nasal communication.



Fig. 4. Interim prosthesis.



Fig. 5. Cast metal framework.

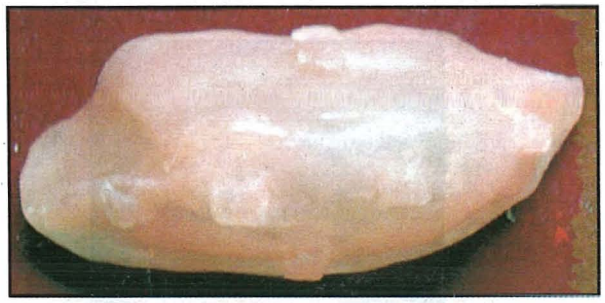


Fig. 6. Hollow bulb made of autopolymerisisng resin.



Fig. 7. Post insertion (frontal)

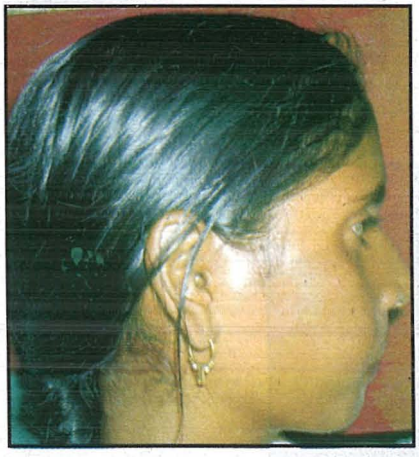


Fig. 8. Post insertion (profile)



Fig. 9. Post insertion (intraoral)

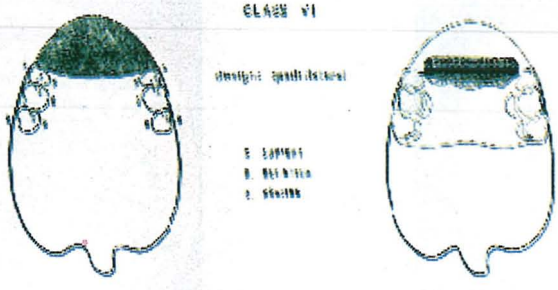


Fig. 10. Armany's class VI design.

b. A wax sheet was also adapted on the mesh of the framework and placed on the cast to form the lid of the bulb; the residual open spaces were closed with the wax sheet to obtain a closed wax bulb.

c. A thin layer of self cure acrylic resin was adapted with sprinkle on method on the inner surface of the wax lining the cavity.

d. Self cure acrylic was also adapted over the wax lining the mesh work and was placed over the cast.

e. This acrylic got bonded with the acrylic lining the cavity; all the residual openings were closed with self cure acrylic. (Refer to fig. 6)

f. This formed a hollow acrylic bulb which will be later on embedded in the heat cure acrylic resin.

g. This hollow bulb reduced the weight of the prosthesis which aided the retainers to retain the prosthesis better.

17. Wax occlusal rims and teeth arrangement was done on the metal framework opposing the lower cast.

18. Try in was done at the sixth appointment in the patient's mouth and minor teeth movements are done for improving the esthetics.

19. The prosthesis was acrylized along with the hollow bulb incorporated in it.

20. The prosthesis was delivered after finishing and polishing in the seventh appointment. (Refer to fig. 7, 8 and 9)

Discussion

Patients with large palatal defects present a significant challenge for prosthetic rehabilitation and the adaptive capabilities of the patient. Retention can be severely compromised and cause difficulties in nutrition and communication. Although implants are promising, the successful use of implants for retention may be compromised by the lack of tissue beds suitable for implantation, reduced healing capacities after adjunctive treatments such as irradiation, poor patient health, and the patient's unwillingness to undergo further surgery. Finally, economic constraints may preclude implants as a viable treatment option. In such situations, ingenuity and creativity may best serve the clinician in attempting to achieve the desired prosthetic rehabilitative result.[6]

This clinical report presents a large premaxillary defect which is very similar to Armany's Class VI situation. The patient was much concerned about the facial esthetics due to depressed left midfacial region.

The class VI defect is a rare surgical creation. Most often it results from a congenital anomaly or trauma such as an automobile accident or a self-inflicted wound that removes the entire premaxillae (and may include a portion of one or both of the maxillae), leaving a single bilateral defect located anterior to the remaining teeth. Surgical defects of this nature are usually small. Nonsurgical defects are usually large and difficult to manage.

Retention is most often provided simply with cast retainers. The I-bar located on the anterior abutment in a midfacial undercut close to the fulcrum line can function effectively. Effective accessory retention can also be achieved by extending the prosthesis anteriorly into the nasal aperture. Cosmetic support of the nose and upper lip is also possible when adequate retention is present. Support is provided by rests located on the disto-occlusal surfaces of the most anterior abutment teeth. Double rests are used when adjacent posterior teeth are involved. The most posterior rests, similar to the Kennedy class IV situation, may be considered indirect retainers, resisting the vertical downward displacement of the anterior segment of the prosthesis. The remaining natural teeth provide all of the support, with little support derived from the defect.[7] (Refer to fig. 10)

Esthetics may be sacrificed in favor of more efficient obturation. Masticatory performance may be reduced in favor of improved retention and/or stabilization. These decisions must be weighed against reasonable patient expectations and desires. Ultimately, optimum treatment results for the patient with a large palatal defect will be best achieved through the judicious use of appropriate treatment modalities tempered by clinical experience.[6]

References

1. **Filiz Keyf**. Obturator prostheses for hemimaxillectomy patients. *Journal of Oral Rehabilitation;* 2001;28:821-829
2. **Thomas A Curtis, Beumer III**. Maxillofacial Rehabilitation: prosthodontic and surgical considerations. 1st ed. Ishiyaku: EuroAmerica, 1996; 229
3. **Thomas D. Taylor**. Clinical Maxillofacial Prosthetics. 1st ed. Chicago: Mosby: 2000; 103-117
4. **Mohamed A. Aramany**. Basic principles of obturator design for partially edentulous patients. Part I: Classification. *J Prosthet Dent 1978*;40:554-557
5. **Mohamed A. Aramany**. Basic principles of obturator design for partially edentulous patients. Part II: Design principle. *J Prosthet Dent 1978*;40:656-662
6. **D. V. Antoniou, J. A. Toljanic, L. Graham**. Obturator prosthesis retention for edentulous patients with large palatal defects: a clinical report. *J Prosthet Dent.* 1996;76;227 – 229
7. **Gregory R. Parr, Greggory E. Tharp, Arthur O Rahn**. Prosthodontic principles in the framework design of maxillary obturator prostheses. *Oral Surgery, Orul Medicine, Oral Pathology* 1989;62:205–12



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