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Rehabilitation of a Hemimaxillectomy Patient with Innovative Interim Obturator Prosthesis – A Clinical Report

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ABSTRACT

Rehabilitation of hemimaxillectomy patients can be challenging. The most common prosthetic treatment problem with such patients is, getting adequate retention, stability and support. The size and location of the defect usually influences the amount of impairment and difficulty in prosthetic rehabilitation. Obturator prosthesis is commonly used as an effective means for rehabilitating hemimaxillectomy cases. In cases of large maxillary defect, movement of the obturator prosthesis is inevitable and requires a form of indirect retention to limit the rotation of the prosthesis. This clinical report describes a modified labial flange as a means of indirect retention, to minimize the rotation of the obturator prosthesis. This approach adequately increases the retention and stability of the prosthesis.

Key Words: obturator, hemi-maxillectomy, modified labial flange

Key Message: In cases of large maxillary defects, the rotation of the interim obturator around the functional fulcrum line can be minimized by providing modified labial flange in the canine- premolar region.

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Introduction

The intraoral defects in the maxilla are due to trauma, disease, pathological changes, radiation burns or surgical intervention. The defect may be small or it may include any portion of the hard and soft palate, the alveolar ridges and the floor of the nasal cavity. Post surgical defects in the maxilla result in hypernasal speech, fluid leakage into the nasal cavity and impaired masticatory function. The primary objectives in rehabilitating the maxillectomy patient are to restore the function of mastication, deglutition and speech and to achieve normal oro-facial appearance [1]. The most common prosthodontic treatment problems with maxillectomy patients are lack of retention, stability and support. The size of the defect, the number of remaining teeth, the amount of the remaining bony structure and patient ability to adapt to the prosthesis are few factors which affect the prognosis of the treatment [2],[3]. The complex anatomy of the midface and its endless potential for surgical or traumatic defect size, shape and location also presents with numerous possible configurations of treatment considerations.

Prosthetic rehabilitation is planned [4] depending upon the type of surgical defect and the relationship of the defect area to the remaining abutment teeth [5]. Obturator prosthesis is commonly used as an effective means of rehabilitating partial or total maxillectomy patients. This type of prosthesis helps in separating the oral and nasal cavities to allow for adequate deglutition, speech, possible support of the soft tissue to restore the midfacial contours and acceptable aesthetic results [6],[7].

The movement of the obturator prosthesis is common and the degree of movement depends on the number and position of the teeth available for retention, size and configuration of the defect, the size, contour, and lining mucosa of the defect, height of the residual alveolar ridge and the availability of the undercuts. This movement of the prosthesis should be minimized in order to provide adequate retention, stability and support [7],[8]. Retainers are one of the most important components contributing to the success of the obturator prosthesis. Selection of the type of retainer is based on the size, location of the defect and the number, position and periodontal status of the remaining teeth. Indirect retention components should be strategically positioned in order to minimize the movement of the prosthesis [9],[10].

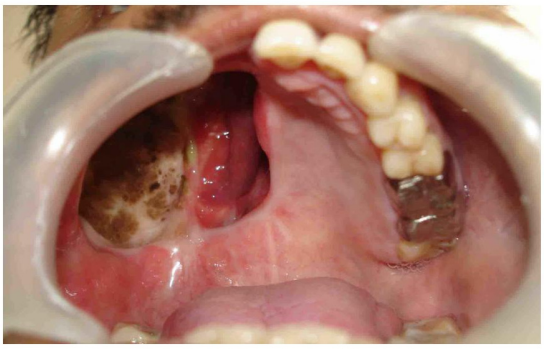
In this clinical report, a hollow bulb interim obturator with a modified labial flange was used to restore speech, deglutition and normal orofacial contour for a patient with partial maxillectomy. There is no case in literature where this type of labial shield has been used as a means of achieving retention.

Clinical Report

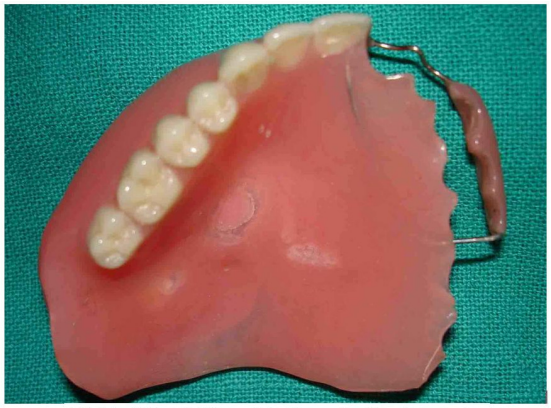
A moderately built 35 years old male patient reported to the Department of Prosthodontics, complaining of difficulty in speech and leakage of food and liquid from the oral cavity into the nasophaynx. The medical records of the patient revealed that he had cemento-ossifying fibroma of the right maxilla involving the maxillary antrum. He underwent right side extended maxillectomy one month ago. On examination, the right side of his face was found to be depressed inwards and gave an unaesthetic appearance. The patient had a large defect extending from right incisor region to the soft palate. He had Class 1 defect according to the Armany classification [Table/Fig 1]. An obvious nasal twang was observed in the speech of the patient. The lower arch was completely dentulous. Considering the large palatal defect on the right side, a closed type hollow bulb interim obturator was planned. To enhance the retention, a labial flange on the left side was modified and was joined with the prosthesis by means of clasps.

The preliminary impression was made with irreversible hydrocolloid (Zelgan 2002, Dentsply India, Gurgaon, India) and a stone cast was poured from the impression. An acrylic resin base was fabricated and green stick compound (DPI Tracing sticks, Dental products of India, Mumbai, India) was used to properly record the tissue on the defect side, so as to achieve a proper peripheral seal. The final impression was made of silicone putty impression material (Aquasil, Dentsply/ Caulk, Milford, DE). The impression was boxed and the master cast was poured in type IV dental stone (Ultrarock, Kalabhai Karson Ltd, Mumbai, India). The denture base was fabricated with self cure resin and occusal rims were made to record the jaw relation. After selecting the teeth (Cosmo HXL, Dentsply Ltd, Surrey, U.K.), denture try-in was performed in the conventional manner, as in the complete denture construction. On the unresected side, a ‘W’ shaped clasp was placed in the canine – premolar region. After verification of the jaw relation, the trial denture was sent to the lab for interim prosthesis fabrication. A closed type hollow bulb obturator was fabricated as a two step procedure. First, the open bulb was fabricated with the heat cure resin (Trevalon Hi, Dentsply India, Gurgaon, India), with a conventional method. Later, in the second step, the lid is sealed to the body of the bulb with an autopolymerising resin. A modified labial flange was fabricated in the canine premolar region [Table/Fig 2]. The final prosthesis was inserted into the patient’s mouth and it was checked for proper palatal contour and peripheral seal [Table/Fig 3] . The patient was educated about the maintenance of the

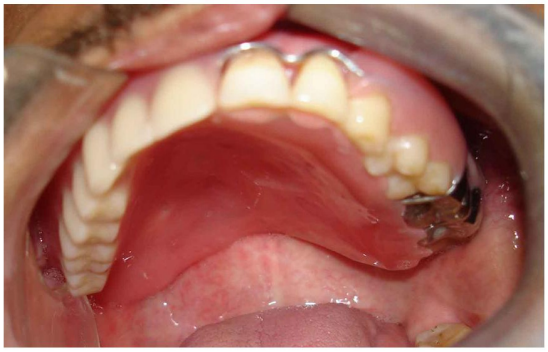
prosthesis and was recalled for regular post-insertion visits. Adequate retention, stability and support were observed on subsequent recalls. The patient's normal swallowing ability was restored by the prosthesis and he was pleased with the dramatic improvement of speech and retention of the prosthesis.



(Table/Fig 1)Class 1 maxillary defect



(Table/Fig 2)Closed hollow bulb obturator



(Table/Fig 3)Intraoral view of the prosthesis

Discussion

Acquired defects in the maxillae due to surgical resection result in a communication between the oral and nasal cavities, that causes difficulty in deglutition, speech and an unaesthetic appearance. Apart from this, it also results in psychological trauma to the patient. Small defects are usually closed by surgical means, but larger defects are often prosthodontically rehabilitated by obturators [11]. Class 1 defect is a unilateral defect which is most commonly seen in maxillofacial rehabilitative practice. It represents the classic maxillary defect where the hard palate, alveolar ridge, and the dentition are removed to the midline [5].

This clinical report illustrates a class 1 defect which was rehabilitated by a closed hollow bulb obturator. The main objective was to decrease the weight and minimize the rotation of the prosthesis. Hollow bulb obturators help to reduce the weight of the obturator, to decrease pressure to the surrounding tissues and to aid in deglutition and to encourage regeneration of the tissues. The lightness of the obturator also does not cause excessive atrophy and physiological changes in muscle balance [1],[8].

The patterns of forces affecting the obturator prosthesis are complex because of their concurrent occurrence and mostly destabilize the prosthesis. These destabilizing forces need to be controlled by effectively and strategically positioning the indirect retainers. In the class 1 situation, the functional fulcrum line lies along the bony contours, next to the resected area and to provide maximum retention, the indirect retainer should lie in the premolar region. In this case, a modified labial flange was placed over the canine and premolars and was connected to the obturator by means of wire clasps. This provision in the prosthesis helped in minimizing the rotation of the prosthesis around the functional fulcrum line and also, it is easy to fabricate and greatly enhances the retention of the obturator.

Conclusion

The most challenging part in rehabilitating the patient with hemimaxillectomy, is to obtain adequate retention and stability. The modified labial flange on the unresected side not only improves retention, but also provides adequate stability to the prosthesis. This type of retention

aid provides an easy option to achieve the primary objective of restoring the functions of mastication, speech and aesthetics.

References

[1] Beumer J, Curtis TA, Firtell DN. Maxillofacial Rehabilitation. Prosthodontic and surgical considerations. C.V. Mosby Co., St Louis, Toronto. 1979 pp.183-243.
[2] Parr GR, Tharp GE, Rahn AO. Prosthodontic principles in the framework design of maxillary obturator prosthesis. J Prosthet Dent 1989; 62: 205-12.
[3] Desjardins R. Early rehabilitative management of the maxillectomy patients. J Prosthet Dent 1977; 38: 311-18.
[4] Taylor TD. Clinical maxillofacial prosthetics. Chicago: Quintessence Publishing; 2000.pp103-54.
[5] Aramany MA. Basic principles of obturator design for partially edentulous patients. Part 1: classification. J Prosthet Dent 1978; 40: 554-57.
[6] Desjardins RP. Obturator prosthesis design for acquired maxillary defects. J Prosthet Dent 1978; 39: 424-35.
[7] Wang RR. Sectional prosthesis for total maxillectomy patients: a clinical report. J Prosthet Dent 1997; 78: 241-44.
[8] Keyf F. Obturator prosthesis for maxillectomy patients. J Oral Rehab 2001; 28: 821-29.
[9] Aramany MA. Basic principles of obturator design for partially edentulous patients. Part II: design principles. J Prosthet Dent 1978; 40: 656-62.
[10] Dumbrigue HB, Fyler A. Minimizing prosthesis movement in a midfacial defect: a clinical report. J Prosthet Dent 1997; 78: 341-45.
[11] Zarb GA. The maxillary resection and its prosthetic replacement. J Prosthet Dent 1967; 18: 268-81.