

Rehabilitation of Anterior Maxillectomy Patient with Dyna Magnets Retained Hollow Obturator: A Case Report

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ABSTRACT

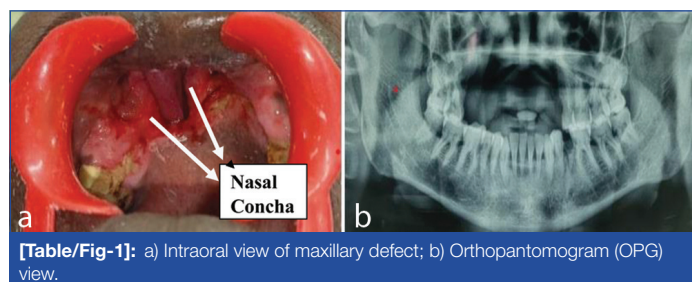
Prosthetic rehabilitation of midfacial defects has always been a challenging treatment plan in prosthodontics. These defects lead to functional and aesthetic deficiencies. These defects are less commonly rehabilitated by surgical construction alone. Typically, a prosthesis is required to restore both function and aesthetics. In the present study, the authors present the case of a 54-year-old male patient who had undergone partial maxillectomy for a verrucous lesion and complains of difficulty in mastication and speech. The objective of the treatment was to fabricate a 2-piece obturator with magnet attachments, facilitating easy insertion and removal. The final prosthesis demonstrated satisfactory retention, stability, and functional efficiency for the patient.

Keywords: Putty index, Soft relined antral hollow obturator, Two-piece obturator

CASE REPORT

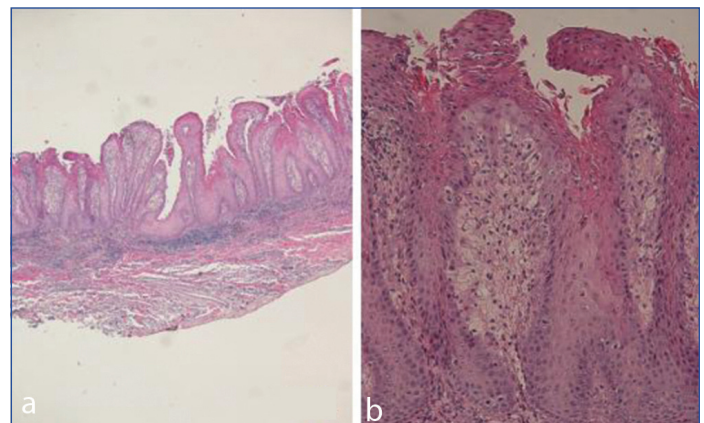
A 54-year-old male patient presented to the Department of Prosthodontics for the fabrication of an obturator. History revealed that he had undergone partial maxillectomy in the anterior region one year ago due to a verrucous lesion. The patient expressed concerns about their unaesthetic appearance, as well as, difficulties with mastication, speech, and experiencing water flowing into the nose while eating/drinking. The patient had severe hypernasality and reflux during swallowing. Intraoral examination revealed the presence of an anterior maxillary defect classified as Aramany's class VI, extending from the left premolar region to the right molar region, crossing the midline [Table/Fig-1a] [1].

The maxillary palate showed a large defect with multiple surgical scars, particularly on the lateral side of the lesion, which presented with oedematous oral mucosa and gingiva [2]. A 2-piece magnet-retained hollow bulb obturator was planned to restore the patient's oral functions, speech, and improve aesthetics. The obturator appliance consisted of two parts: an antral part and an oral part [3]. An Orthopantomogram (OPG) was also done to reveal the maxillary status [Table/Fig-1b]. The defect also revealed the presence of right and left nasal conchae [Table/Fig-1a]. An edentulous area was present from the #14 to #26 region. Histopathological examination after surgery revealed a verrucous lesion with well-differentiated keratinising squamous cell carcinoma, which is a rare condition [Table/Fig-2].



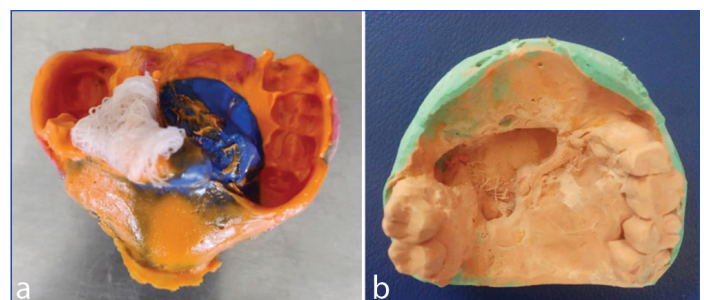
Fabrication Procedure

Alginate (irreversible hydrocolloid) impressions were made of both arches for primary diagnosis and treatment planning. The



[Table/Fig-2]: Verrucous lesion with well-differentiated keratinising squamous cell carcinoma (2a: 4X and 2b: 10X magnification).

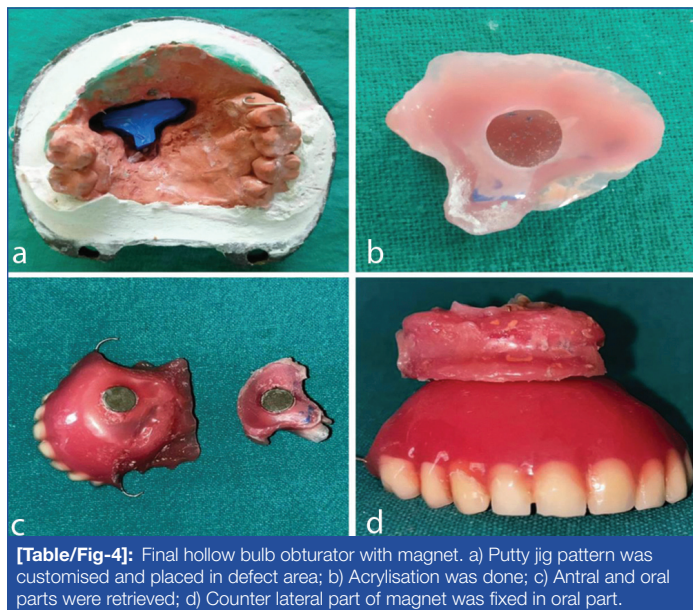
impressions were poured with type IV die stone to obtain casts. A customised impression tray was fabricated using self-cure polymers. Elastomeric impressions were made using the custom tray with putty and light body materials (Aquasil Monophase; Dentsply; Caulk, Germany). Die stone type 4, cast was created after the final impression [Table/Fig-3a,b].



[Table/Fig-3]: a) Elastomeric impressions using a custom tray with putty and light body; b) Die stone cast type 4.

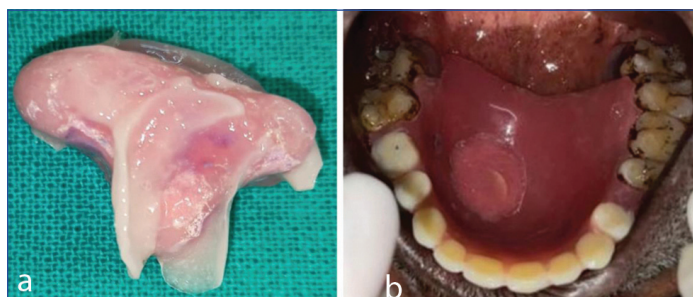
A wax rim was fabricated, and the vertical dimension was assessed. The cast was mounted on a semi-adjustable Whip Mix articulator. Acrylic denture teeth were arranged, and factors such as lip support, smile line, hypernasality, and speech were checked. After the try-in, the obturator was evaluated for any defects. Flasking and dewaxing were performed.

During the packing stage, a customised putty jig pattern was placed in the defect area to fabricate the hollow part of the obturator [Table/Fig-4a]. Heat-cure acrylic resin (Lucitone, L.D. Caulk Co.) was mixed according to the manufacturer's instructions and packed in the doughy stage into the final cast portion of the flask. Acrylisation was done with short curing cycle. After the deflasking procedure, antral part A and oral part B were retrieved with two wrought wire clasps. A central hole was created in part A to remove the putty [Table/Fig-4b,c]. A magnet was placed in relation to the customised hole of part A and fixed in place using self-cure resin [Table/Fig-4c]. The counterpart of the magnet was fixed in the oral part B of the prosthetic appliance using the same material [Table/Fig-4d].



[Table/Fig-4]: Final hollow bulb obturator with magnet. a) Putty jig pattern was customised and placed in defect area; b) Acrylisation was done; c) Antral and oral parts were retrieved; d) Counter lateral part of magnet was fixed in oral part.

First, the antral part was relined with a permanent soft liner (Silagum, DMG, Hamburg Germany) in the patient's mouth and placed in the oral cavity. The antral part was inserted first, followed by the placement of the oral part. The fit and occlusion were evaluated and adjusted after the insertion of the obturator. The obturator demonstrated good retention and stability [Table/Fig-5a,b]. The maximum intercuspation occlusion was reasonably good in centric, left, and right positions [Table/Fig-6a-c]. The patient expressed satisfaction with the obturator during the six-month follow-up period [Table/Fig-7a,b].



[Table/Fig-5a,b]: Obturator: a) Antral part; b) Oral part.

DISCUSSION

Palatal defects can occur due to various factors such as congenital malformations, trauma, disease, pathologic changes, radiation burns, or surgical intervention. Surgical reconstruction alone is less commonly used for rehabilitating these defects. Maxillofacial prostheses have always aimed to achieve characteristics such as lightweight, retention, stability, aesthetics, and perfect



[Table/Fig-6]: Occlusion in a) Right; b) Left; c) centric positions.



[Table/Fig-7]: a) Preoperative; b) Postoperative images of patient facial profile.

functionality. The primary goal of a prosthetic obturator is to close the defect and separate the oral cavity from the sinonasal cavities. Surgical resection of the maxillae or the soft palate can result in a communication between the oral and nasal regions, leading to difficulties in swallowing, nasal leakage, unintelligible speech, and loss of facial support [3]. In dentate patients, the remaining teeth play a crucial role in providing retention, support, and stability to the obturator. In cases involving large defects, the weight of the obturator becomes a major concern. Lack of retention and stability are common problems associated with obturators. In such cases, a hollow obturator is the preferred treatment option [1]. Retention can be achieved through remaining soft tissue undercuts, the lateral part of the defect, and scar bands [4]. However, when the defect size is too large, prosthetic rehabilitation becomes challenging as the remaining structures cannot stabilise the prosthesis over the defect. Instability of the obturator results in air and fluid leakage through the nasal cavity, compromising its function [5]. In the present case, resilient liners were used to aid in the retention of the antral part of the obturator, utilising the available antral anatomy. Resilient liners offer a simplified and modifiable treatment option that is also cost-effective. Magnets were employed in the hollow bulb obturator for retention due to their small size and strong attractive forces. The use of a two-piece hollow obturator allows for easy insertion and removal, without causing discomfort in the mouth [3]. The care of these patients requires a multidisciplinary approach to aid in their aesthetic and functional adaptation, helping them regain their quality of life.

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