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ORIGINAL ARTICLE

Magnet Retained Sectional Lip Plumper Prosthesis for A Patient With Hemi-Mandibulectomy: A Clinical Report

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ABSTRACT

An intraoral sectional prosthesis was fabricated to restore more normal contour to a patient's lower lip that was compromised following a marginal mandibulectomy which was performed to eradicate a malignant neoplasm. The surgical resection compromised the lower lip on the affected side, because the marginal mandibular branch of the facial nerve was damaged during the surgical resection. The prosthesis successfully restored the lost lip support, reduced the incidence of lip biting and improved the patient's oral competency. This clinical report describes the procedure for making an intraoral magnet retained lip plumper prosthesis to improve patient aesthetics and oral function.

Key Words: Marginal Mandibulectomy, Lip plumper, Magnets

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Introduction

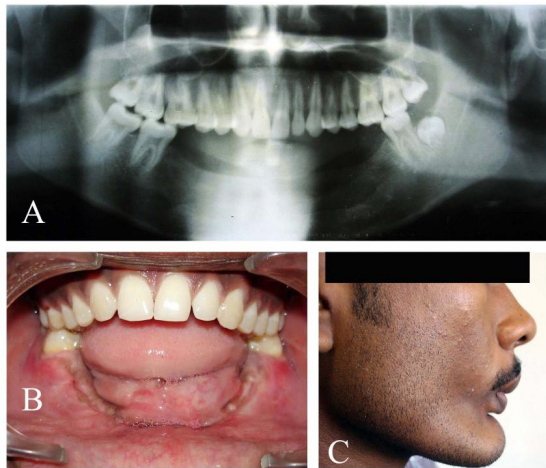
Mandibulectomy patients suffer numerous problems with mastication, speech and deglutition due to anatomical compromise resulting from tumour resection. [1],[3] Recent advances in treatment modalities, including reconstructive surgery, have resulted in improved collaborative rehabilitation efforts between surgical reconstruction and prosthodontic rehabilitation. [4],[5] However, even if the defect has been reconstructed or the resection was limited, there are some situations in which patients suffer from the deformity of the lip due to the damage of the marginal mandibular branch of the facial nerve. Loss of motor innervation to muscles controlling the lower lip leads to paralysis on the affected side of the mouth [1].

In these situations, patients are treated by using therapies that induce the regeneration of the nerves, including nerve grafting, adenosine triphosphate drugs, vitamins and acupuncture [6], [7]. However, nerve regeneration occurs over a long period of time and occasionally may not be adequate or complete. Some patients wish to recover more quickly than is possible with nerve regeneration. Therefore, an alternative to surgical intervention or medicinal therapy is prosthesis. A sectional lip plumper prosthesis is fabricated from heat-polymerized acrylic resin to provide lip support on the affected side. This prosthesis can successfully restore not only the contour of the deformed lip, but can also improve oral function. Few papers focusing on the prosthetic rehabilitation for paralytic lip after a mandibulectomy have been reported in the literature [8]. This clinical report describes the procedure associated with the fabrication of a magnet retained sectional lip plumper prosthesis.

Clinical Report

A 25-year-old male was referred to the Saveetha University's Maxillofacial Prosthetic Clinic in June 2006 for prosthodontic rehabilitation. The patient had undergone a marginal mandibulectomy from the mesial surface of the right lower second molar to the

mesial surface of the left lower second molar and without any flap reconstruction. [Table/Fig 1] (Fig. 1, A and B). The panoramic radiograph reveals an impacted third molar on the left side of the mandible, which needs to be extracted. Extraoral examination demonstrated that the lower lip was unsupported and that there was loss of muscle tone and also the deepening of the mentolabial sulcus [Table/Fig 1] (Fig. 1 C). The remaining dentition in the patient's mandible included the right third molar to the second molar and the left second molar. The intermaxillary space in the region of the surgical resection was high. Thus, the treatment plan to restore the mandibular arch included a cast partial denture, along with a magnet retained lip plumper prosthesis for the compromise of lower lip support and postural position, because the patient was particularly sensitized to this issue when his friends and relatives commented unfavourably on the appearance of the lower lip [Table/Fig 1] (Fig. 1 C). The sectional prosthesis was recommended because of its advantages of ease in maintenance and retrievability, according to the patient needs.



(Table/Fig 1)

A, Panoramic radiograph.

B, Intraoral view of mandibular dental arch.

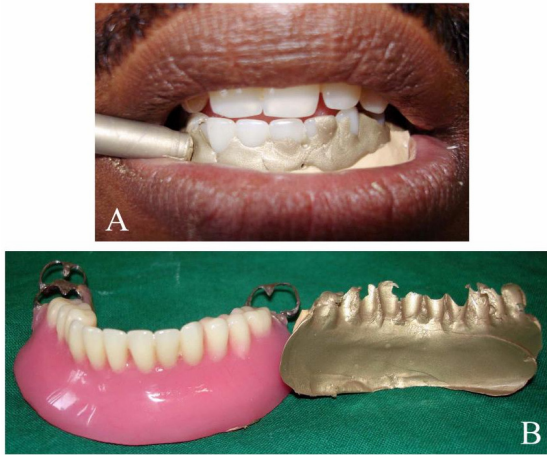
C, Front facial and side views of patient. Deepening of mento-labial sulcus is evident

The tumour resection resulted in damage to the right marginal mandibular branch of the facial nerve. The deformity of the lower lip was noted to be improved by applying cotton rolls to the affected region in the labial and buccal

vestibule to increase lip support from the mandibular right incisor to the left second premolar region. An intraoral sectional prosthesis which was fabricated from heat-polymerized acrylic resin and which was retained with magnets to the existing cast partial denture was designed and constructed to create the contour improvement which was noted when using cotton rolls. This was then placed in the labial and the buccal side of the cast partial denture.

A preliminary impression was made with irreversible hydrocolloid (Zelgan 2002; Dentsply-India, Gurgaon, India). A custom tray (Pyrax; Pyrax polymer) was then fabricated. The definitive cast was prepared from an impression of the mandible by using the custom tray with silicone impression material (AFFINIS Precious, Regular; coltene whaledent). A cast partial denture was fabricated under the standard protocol and was delivered to the patient. A record base made of Soft putty (AFFINIS Precious, Soft putty; coltene whaledent) was then designed to be retained on the labial surface of the cast partial denture (Fig. 2, A). A light body silicone impression material (AFFINIS Precious, Light body; coltene whaledent) was added to the buccal side and also on the intaglio surface of the putty record base and was adjusted until the patient was satisfied with the profile of the lip [Table/Fig 2] (Fig. 2 B). The lip plumper prosthesis was made of heat-polymerized clear acrylic resin (Trevalon, Dentsply-India), so as not to compromise the patient's aesthetics and was retained to the denture with 2 Magnets [Table/Fig 3] (Fig. 3A and B). The profile of the right lower lip of the patient was improved by wearing the lip plumper prosthesis [Table/Fig 4] (Fig. 4 A). Without the lip plumper in place, the left lower lip retracted under the maxillary lateral incisor and canine, which resulted in lip biting and the loss of oral competency. With the lip plumper in position, these unfavourable sequelae were diminished by restoring the lower lip to a more anatomically correct relationship with the upper lip [Table/Fig 4], [Table/Fig 5], [Table/Fig 6], [Table/Fig 7]. After the placement of the lip plumper, lip biting and the irritation of the mucosa opposing the anterior lower edge of the plumper was observed. Cheek biting was prevented by recontouring the plumper and the irritation of

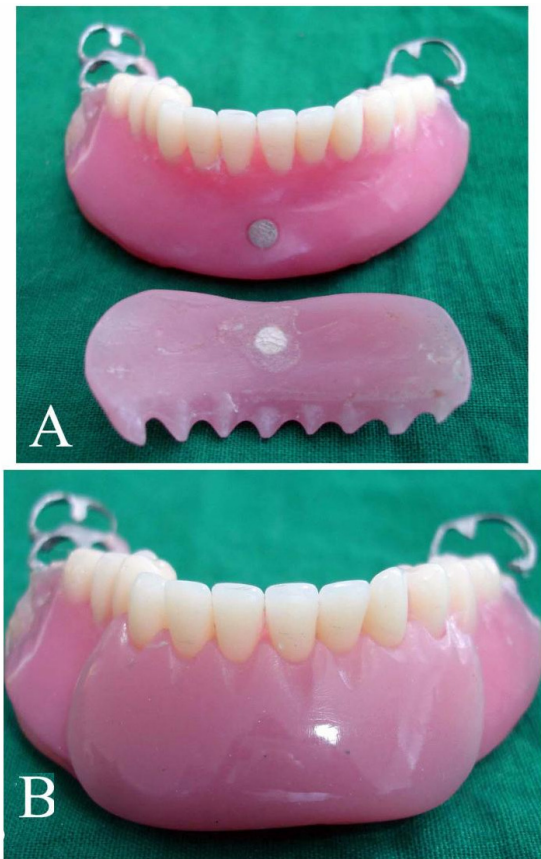
the mucosa was resolved by reducing the thickness of the lower anterior corner of the plumper.



(Table/Fig 2)

A, Buccal contour of soft putty record base adjusted with Light body silicone impression material to establish lip profile

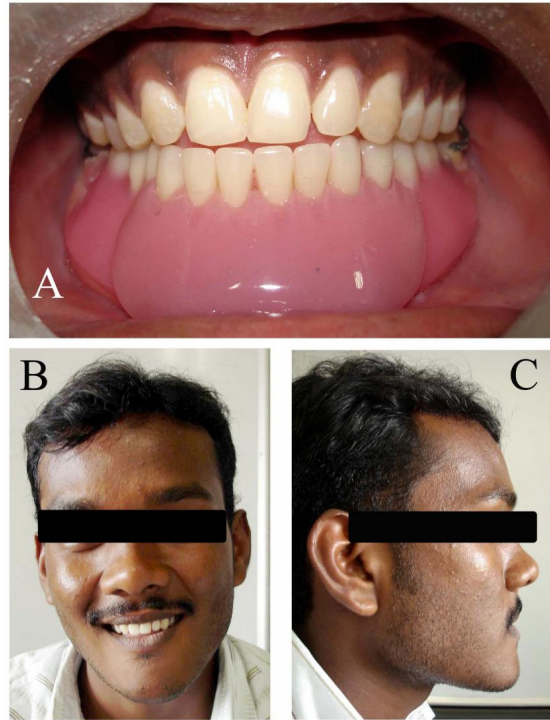
B, Intaglio surface view of the contoured record base.



(Table/Fig 3)

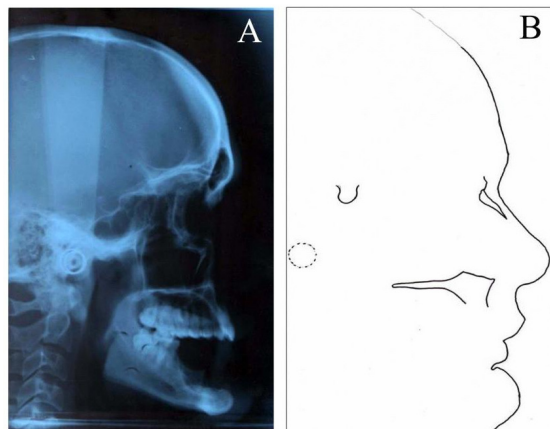
A. Magnets secured with autopolymerizing acrylic resin

B. Magnet retained lip-plumper prosthesis in place



(Table/Fig 4)

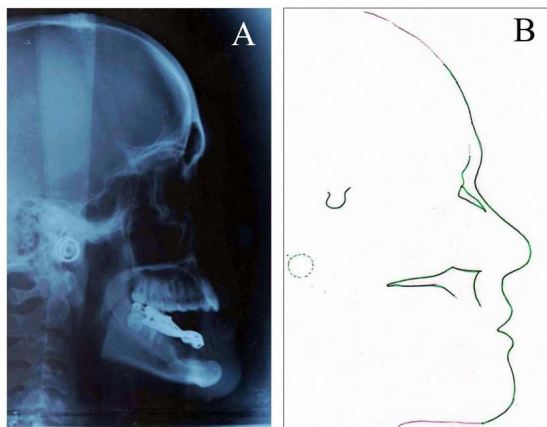
A, B & C Front facial and side views of patient with lip-plumper prosthesis



(Table/Fig 5)

A. Pre-Treatment lateral cephalograms of the patient

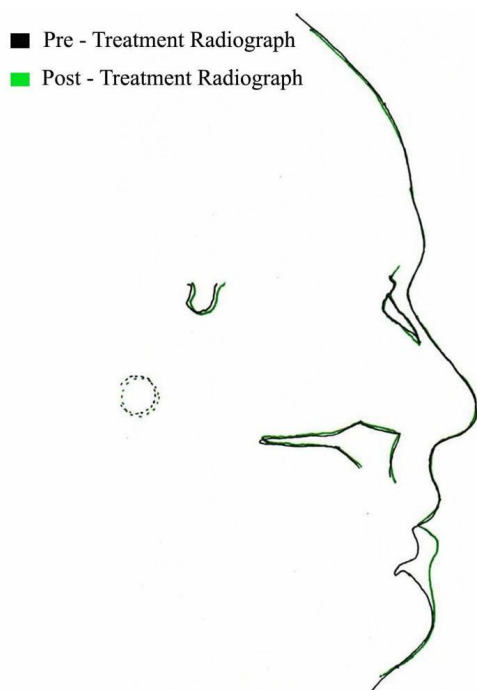
B. Tracing of Pre-Treatment Cephalogram.



(Table/Fig 6)

A. Post -Treatment lateral cephalograms of the patient

B. Tracing of Post -Treatment Cephalogram.



(Table/Fig 7)

Superimposition of Pre and Post Treatment Lateral Cephalograms.

Discussion and Summary

The magnet retained lip plumper prosthesis successfully restored the contour of the lip and improved the function for a patient who had undergone a marginal mandibulectomy. Even though modern surgical corrections are possible using vascularised free flap grafts; the bone resorption rate is higher in hemi-mandibulectomy cases [9], [10]. If the loss of hard and soft tissue during Hemi-

mandibulectomy is more, it radically alters the prognosis of the prosthetic. Several modifications such as the Neutral zone technique and Double rows of teeth are recommended during the fabrication of the partial denture [11], [12]. This clinical report indicated that a magnet retained lip plumper prosthesis has potential as a treatment method to alleviate the problems caused by marginal mandibulectomy and the resultant loss of muscle activity associated with such aesthetic impairment. The changes in appearance, function and psychological wellbeing have an enormous impact on the patients' personal lives and are rewarding for the maxillofacial prosthodontist who is providing this care.

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