HOLLOW BULB OBTURATOR LINED WITH RESILIENT LINER – SIMPLE APPROACH TOWARDS COMFORT – A CASE REPORT

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Introduction

An obturator (Latin, obturare – to stop up) is a prosthesis or portion thereof that closes an opening created as the result of loss or absence of hard tissue, generally in the maxillary arch.

The obturator prosthesis has been used to restore masticatory function and improve speech and cosmetics for patients having either congenital or acquired defect in the maxillary arch. It may involve floor of the orbit, nasal cavity, zygomatic process or hard palate itself. The basic design of obturator prosthesis uses the available tooth and bearing tissue to achieve maximum retention and stability. The primary goals of the obturator prosthesis are to preserve the health and tone of the remaining tissues and provide comfort, function, and esthetics to the patients[1,2]. and psychological boost for the patient's self-image[3].

An obturator should be light in weight, stable, nonirritating, comfortable, simple in design, readily removable and capable of restoring both contour and physiologic function, such as speech and swallowing (Appleman, 1951). The total restoration of function as well as anatomic contour may be impossible.

The history of the maxillary obturator prosthesis is well documented. Ambroise Pare (1509-1590) was the first to describe its use[4]. Since then techniques have varied according to the ingenuity of the clinician and available materials. Results of rehabilitation with maxillary obturator prosthesis have also varied. The names of two very prominent historical personalities have frequently been cited. Those are Sigmund Freud and Grover Cleveland. Dr. Freud had extreme difficulty coping with his obturator, whereas President Cleveland was able to address the U.S. congress within 2 months of surgery[5]. Numerous factors influence the successful long-term use of an obturator prosthesis by a patient. Among these are defect size, presence or absence of teeth, trismus, xerostomia, and other side effects of adjuvant therapy, recurrent disease, and patient motivation. All these factors influence the patient's postoperative quality of life.

Case report

A 30 years old female patient was referred to the Department of Prosthodontics in Dec. 1998 with the complaints of ill fitting existing bulb obturator. She gave a history of wearing different kinds of obrurators like-surgical obturator, intermediate obturator and finally bulb obturator. On examination, the obturator did not engage the available undercut due to which the patient was not comfortable during functions like-chewing, swallowing,

talking and esthetically as well as psychologically. It was tried to improve the retention in the existing bulb obturator by tooth modification and by activating the clasps. Patient was still not comfortable with these modifications. So it was decided to make a new hollow bulb (extension) obturator in which the exterior of the hollow extension was coated with soft silicone, Molloplast-B (Dentax; GmbH & Co. KG, Germany). The hollow extension consists two layers of different materials. The exterior of the hollow extension, which is in apposition with the defect, is coated with a soft, resilient silicone. The interior of the hollow extension is fabricated of hard self-curing acrylic resin (as shown in the figure 1), supporting and reinforcing the resilient liner layer.

For this purpose impression of maxillary arch was made with rubber base (putty and light body combination). Master cast was prepared after pouring the impression. After blocking out undercuts with hard modeling wax temporary denture base was made. Waxed-up obturator along with base on the model was invested in the large flask. After dewaxing undercuts were blocked out and 1 mm layer of wax was adapted on the walls of the defect area. Over this self-curing acrylic shim was prepared. Hollow bulb was made with self-curing acrylic resin. Lid was fabricated to close the shim filled with salt. Two holes were made in the shim to flush the salt with water. After wax elimination, defect and undercut area was packed with Molloplast-B heat curing soft liner dough following manufacture's directions and heat curing acrylic resin dough was packed over this as a denture base. Processing, deflasking finishing and polishing was carried out as per manufacturer's instructions. The obturator

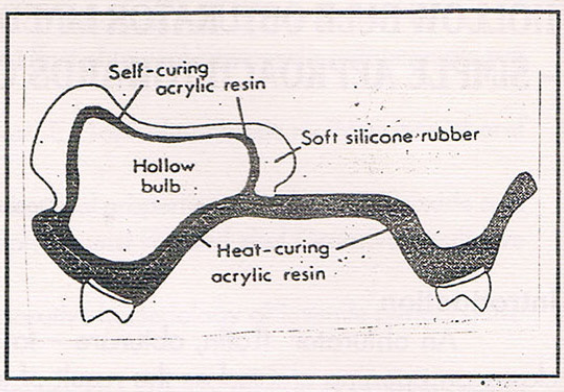

Fig. 1. Cross section of completed hollow extension obturator in which the exterior of the hollow extension is coated by a soft silicone layer over a hard acrylic resin shell-like shim.

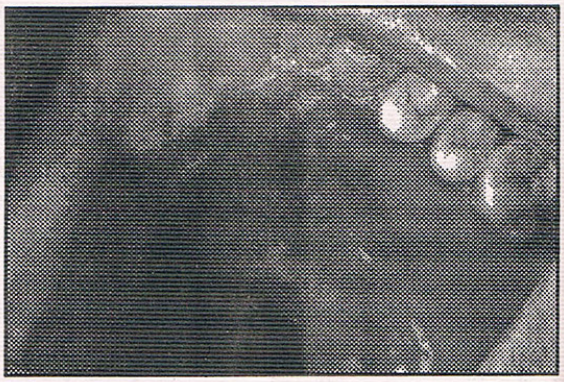

Fig. 2. Acquired palatal defect, -Intraoral view

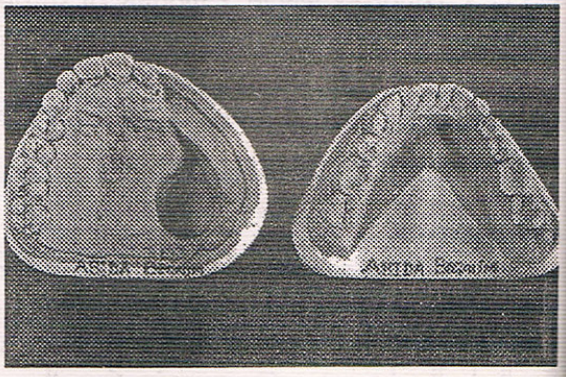

Fig. 3. Master Casts

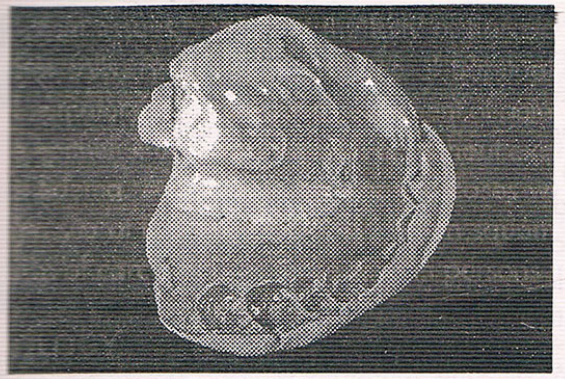

Fig. 4. Rubber base impression with custom tray (Putty & light body combination)

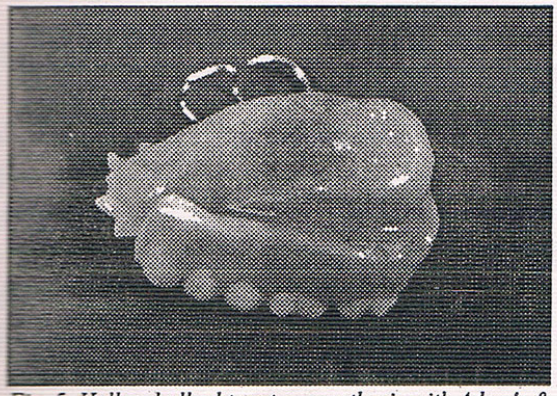

Fig. 5. Hollow bulb obturator prosthesis with Adam's & C-clasp

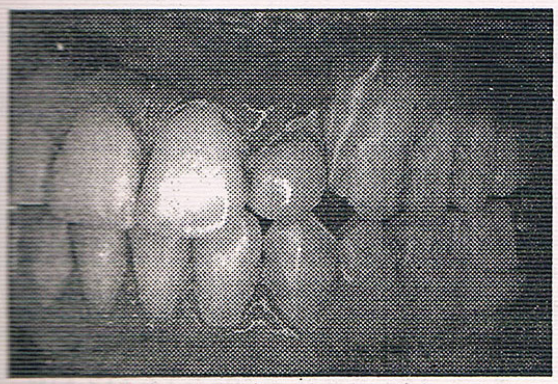

Fig. 6. Hollow bulb obturator prosthesis in patient's mouth

was inserted into the mouth. Necessary trimming and adjustment of clasps were done. Patient was given post insertion instructions and recalled after 24 hours for check up. She was advised to take high protein diet and keep the obturator clean.

After 24 hrs of recall visit necessary adjustments in the denture base extensions were carried out. On 3rd day's visit occlusal corrections were made. Patient was recalled after 3 months and 6 months. During recall visit the obturator as well as defect were examined carefully. There were no signs and symptoms of inflammation in the defect area. Patient's acceptance was evaluated. According to her, she was totally comfortable during insertion and removal of prosthesis, chewing as well as swallowing.

The satisfaction was rated high as compared to all the obturators she was wearing earlier. Prosthesis constructed in this manner-indicated success in function and tissue tolerance with minimal need of adjustment.

The resiliency of the outer surface of the hollow extension facilitates insertion of the prosthesis into deep undercuts, providing improved retention while minimizing tissue irritation in a manner not possible in the past when hard acrylic resin devices were used in apposition to nasal mucosa and other soft tissue structures. The hard acrylic resin shim provides shape and strength to the obturator and stability under stress, which was not the case previously when sole use of hard acrylic resin was used in the construction of the hollow extension.

Discussion

Rather than seeing a maxillary defect as a serious problem for deglutition, speech

and mastication to be overcome, the defect area can be successfully utilized for retention, stability during function as well as limited support for obturator prosthesis with the use of resilient liner. Dimensional stability of silicone materials has been investigated, with particular emphasis on their use as denture liners[6]. The dimensional stability of silicone hollow extension obturator, in various sizes and shapes used as prosthesis for large oral-nasal defects, has not yet been determined. Empirical evidence to data suggests that the stability is sufficient not to pose a major impediment to continual use of the silicone in clinical practice. However durability of resiliency of the resilient liner should be evaluated periodically at least twice in a year and obturator be relined accordingly if the resiliency is affected.

Moreover, due to increased wettability, the plaque/candida adherence may pose threat to hygiene of already mutilated mucosa in the involved defect area. The silicone based heat cured Molloplast-B (Dentax; GmbH & Co. KG, Germany) does not promote the adherence of candida organisms. Therefor it can be safely used for relining the hollow bulb obturator.

Conclusion

Maxillary resection has a high level of morbidity, with significant psychological and functional implications for the patient [7,8]. To restore function, it is essential that the surgical defect must be obturated adequately to prevent escape of air, fluid and food between the oral and nasal cavities. In large resection cases the obturator may also need to provide support for the overlying facial tissues. This invariably places high demands on the retentive ability of the obturating prosthesis.

A philosophy and technique is presented for the construction of a hollow extension obturator comprised of two material:

(1) and inner hard acrylic resin hollow core to decrease weight and provide dimensional stability and

(2) an outer layer of soft silicone to enhance retention and tissue tolerance.

Reference

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