Maxillary Hollow Obturator for Rehabilitation of Palatal Defect: A Case Report

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Abstract

Intraoral defects may be congenital or acquired are most commonly seen in the maxilla. These are usually large openings in the palate or the peripheral structures along with palate. Patients with acquired maxillary surgical defects very commonly appear with lingering functional disabilities and cosmetic disfigurement. One of the most acquired jaw defects among all is a patient suffering from oral cancer. The aim to treat this entity is to give a comfortable, cosmetically acceptable prosthesis that can restore the impaired physiological activities i.e deglutition, speech, and mastication. An obturator is very much promising for this type of complaint. Obturatorsprimarily close more specifically seal the defects to restore the above-mentioned patients' basic needs and as well as aesthetics when it is concerned. This article presents a case report describing the technique for fabricating a hollow bulb obturator in a hemimaxillectomy patient.

Keywords: *Hollow obturator, Maxillary defect, Rehabilitation, Aramany Classifications.*

Introduction

Defects of the maxilla are more often formed by surgical removal of benign or malignant tumors, to trauma or infectious causes or oral cancer. Prosthodontics is the specialty of dentistry,which deals with restoration and rehabilitation of maxillofacial defects. Complete and sometimes partial surgical removal of tumors in the maxillary region can lead to chewing, phonation,aesthetic, and functional disorders.[1] The aim is to fabricate obturator prosthesis which seals tissue openings of the palate and contiguous structures and improves the quality of life by recuperating of course aesthetics and also deglutition, speech, mastication. Rehabilitation and re-establishment of functions by prosthesis of patients with maxillary defectsis divided into three phases and each having altered objectives. The initial phase of the treatmentis called surgical obturation and entails the placement of prosthesis during the surgical procedure. It primarily helps to restore and maintain oral functions at the time of immediate postoperative period.[2]

The second phase is called the interim obturation, and it allows the tissue to heal. The interim obturator is usually fabricated 2 to 6 weeks after the surgery and it is held in reserve till the final prosthesis is made.[3-5] The third or last phase of treatment is the fabrication of definite obturator which is made 3 to 6months after the surgery when the site is well healed.[6,7] Hollow obturator is one of the best treatment options for rehabilitation and re-establishment oforal function and aesthetic. There is numerous way of fabricating the hollow obturator. All these techniques propose to provide a lightweight prosthesis that is well accepted by the patient. The open bulb obturator provides the benefit of easy cleans facility, but the accumulation of moisture necessitates frequent cleaning. One piece of hollow bulb obturator can be

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fabricated by refilling the hollow portion using materials like salt, sugar, sponge, polyurethane foam, and gas injection using argon gas. Some times nondetachable screw cap may also be used to coat the opening made to serve the sugar or salt.[8,9]

Case Report: A 62 years male patient from Berhampur, Odisha came to the Department of Prosthetics and implantology, IDS, Bhubaneswar, Odisha with the chief complaint of missing teeth in upper left back tooth region and closure of the defect in the same region. On eliciting the history of presenting illness hemi maxillectomy has been done to cure the squamous cell carcinoma of the left half of palate, 3 months back from the reported date.

On further interrogation,the patient gave no relevant past medical history. He was a chronic gutkha chewer, 4-5 times per day, for 10-15 years approx, placement of the gutkha in the left buccal mucosa. But he discontinued the habit since he was planned for the surgery. He was well oriented to the time, place, and person and all the vitals were in the normal range. On examination, there is partially edentulous from 13 to 17. The patient has generalized attrition. The left palatal arch distal to 12 is showing erythematous area with erythematous border. Tissue healing of that part is satisfactory. It is encountered that the defect is the Armani class II maxillary defect in the left palatal arch.

Impression Procedure:

Figure 1: Intra oral pictures of maxillary defect.

Before making the primary impression patient's mouth was cleaned thoroughly with a salinecoated wet gauge. Then a small piece of the wet gauge with saline was put deep inside the defect to prevent naso-oral communication. Then the primary impression was made using alginate. The primary cast was made and a special tray was fabricated. Border molding was done using a green stick compound. And the final impression was made using elastomeric impression material. The master cast was thus, obtained over which denture base was fabricated. Jaw relation was done. Teeth arrangement was done by using monoplane teeth due to generalized attritionand tried in the patient's mouth. 3 C clasps were made by 21 gauge orthodontic wire with the help of Adam's and universal pliers. One clasp was placed around the left lateral incisor and the other two were placed around the right canine and first molar respectively. Then these clasps were sealed along with the trial obturator over the master cast. Then wax-up was done properly.

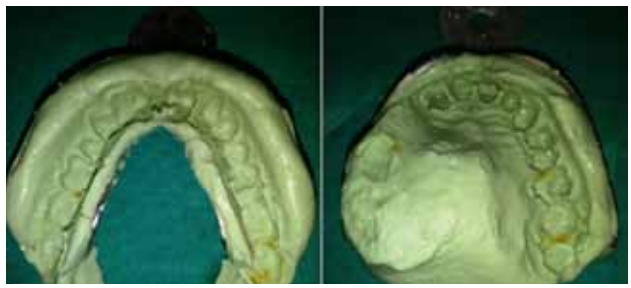

Figure 2. Primary impression of maxilla and mandible

Figure 3. Final impression

Processing Technique: The whole trial denture assembly was flasked and dewaxed. Upper and lower part of the flask was cleaned and wiped properly. Separating media was applied properly in both parts. Heat cure acrylic powder and liquid were mixed in a porcelain cup according to the manufacturer's instruction. Previously depending upon the size of the defect salt was kept for the packing procedure. When the dough stage reached one layer of acrylic material was placed along the floor of the defect. Then salt was put over it and again wrapped by acrylic material and packed properly by a clamp.

It was left for bench cooling. Then salt was vaporized during the curing procedure inside the waterbath. After cooling down the flask, the obturator was retrieved and cleaned properly. Holes were made in the lid for easy cleaning with the round bur. The obturator was finished and polished.

Figure 4. Final prosthesis

Figure 5. Intraoral pictures showing occlusion after insertion

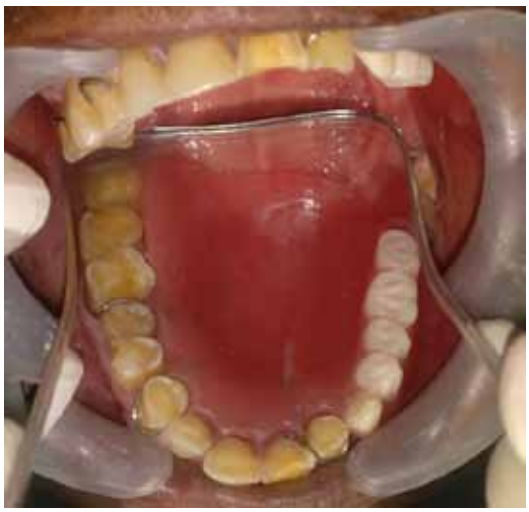

Figure 6. Intraoral view of a final prosthesis

Discussion

"In 1978 the late Dr. Mohammed Aramany presented the first published system of classification of postsurgical maxillary defects. He divided all defects into 6 categories based on the relationship of the defect to the remaining teeth and the frequency of occurrence of the defect".[10]

Class I. Curved Arch form and Linear Arch Form: "The class I category represents the classic maxillary resection defect where the hard palate, alveolar, ridge, and dentition are removed to the midline. This unilateral defect is the one most commonly seen in the maxillofacial rehabilitative practice". "The linear design is used for the class I defect when there are no anterior teeth present or when one does not desire to use the anterior teeth. The remaining posterior teeth are usually in a relatively straight line."

Class II: "Class II includes arches in which the premaxilla and the premaxillary dentition on the contralateral side are maintained. A single, unilateral defect is located posterior to the remaining teeth."

Class III: "Class III involves a midline defect of the hard palate and may include a variable portion of the

soft palate as well. The dentition is usually preserved, making this obturator prosthesis design simple and effective."

Class IV: "Class IV situations involve the surgical removal of the entire premaxillae, leaving a bilateral defect anteriorly and a lateral defect posteriorly. There are often a few remaining posterior teeth located in a relatively straightline, creating a unilateral linear design problem where leverage cannot be used to an effective degree."

Class V: "This situation involves a bilateral posterior surgical defect located posterior to the remaining teeth. Many or all of the teeth are present anterior to the defect. Labial stabilization and the use of splinting, especially of the terminal abutments, is desirable."

Class VI: "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."

Maxillectomy results in a sudden change in the physiological process creating oronasal and oroantral communication. An obturator provides a simple reconstructive solution for separating oronasal communication, reducing the difficulties associated with swallowing, mastication, supporting the facial soft tissues, re-establishing speech and providing immediate dental restoration, without the need for second surgery.[11]

The remaining teeth and their location and number will determine the type of retainer to be used. Retainers that are properly designed help to reduce stress to the abutment tooth. Hence, while designing the clasp assembly, basic principles such as passive placement, encirclement and stabilization should be followed. However, in cases with large palatomaxillary defects, the stability and retention of the obturator could be significantly compromised because of the diminished bone support or if terminal abutment tooth is absent, for long-term clasping. There are different types of retentive aids that are used for the conventional hollow-bulb obturator prosthesis such as magnets and snap-on (friction type) attachments, acrylic buttons, retentive clips and implants. Implants reduce prosthesis movement, prevent rotation and encourage axial loading. Obturators retained using implants and cast metal framework will be of a different design and their weight may change accordingly. In this particular case, the patient was not willing to have further surgical procedures or to bear the additional cost involved. Obturator with open lid inserted intraorally.[12-14]

A heavy obturator prosthesis exerts continuous stress affecting the health of the tissues and resulting in discomfort. The weight of the prosthesis should be minimized to reduce dislodging forces. The most commonly used material for the fabrication of obturator prostheses is heat cure acrylic resin because of its durability and compatibility with tissues. A hollow-bulb obturator fabricated by the open lid technique is a lightweight prosthesis that not only extends effectively into the defect area but can also be easily tolerated by the patient. It is hygienic and increases speech intelligibility.[15]

Conclusion

In patients with maxillary defects, surgical procedures cannot provide satisfactory cosmetic and functional rehabilitation. These are compromised people who require physical as well as psychological rehabilitation through a multidisciplinary approach.A good result will depend upon the correct diagnosis and well-made treatment plan. Obturator satisfies the functional and psychological needs of the patient and aneffective treatment modality. This case report discussed the prosthetic treatment of acquired maxillary defect with one obturator.

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