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Review paper

Rehabilitation of a Partial-Maxillectomy Patient with a Split Obturator in Restricted Mouth Opening: A Case Report

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Twin occlusion

ABSTRACT

Rehabilitation following surgical resection of the maxillary region is a challenging task for maxillofacial prosthodontists, with defect size and location impacting the level of impairment. The communication between the nasal and oral cavities often cause difficulties with speech, swallowing and aesthetic appearance. An obturator prosthesis is commonly used to address these issues in hemi maxillectomy cases. This article presents a case of maxillary defect caused by squamous cell carcinoma, featuring unfavourable undercuts and the patient with limited mouth opening. The defect was successfully treated with an immediate obturator post-surgery, followed by a one-piece, closed hollow bulb obturator. By utilizing the remaining palate and dentition, the prosthesis maximized support, stability and retention, while acting as a barrier between the oral and nasal cavities.

1. Introduction

Maxillary defects, which commonly present as openings into the antrum and nasopharynx can arise from various causes. These defects may be congenital, developmental, acquired, traumatic or surgical impacting the oral cavity and its associated anatomical structures.

Acquired maxillary defects are distinct from congenital ones as there is disruption of normal physiological processes following maxillary surgical resection. Using an obturator prosthesis for prosthodontic rehabilitation can help restore the patient's quality of life.

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Oral squamous cell carcinoma is the most common malignant epithelial neoplasm of the oral cavity, typically occurring between the fifth and seventh decades of life and represents 90% of oral carcinomas. Treatment should follow the National Comprehensive Cancer Network guidelines with a multidisciplinary approach. Management is primarily based on the disease stage with surgical intervention being the preferred method for both early and late stages, aiming for clear margins of 1 to 2 cm.

A maxillofacial prosthesis plays a vital role in improving both orofacial aesthetics and the restoration of fundamental functions such as chewing, swallowing and speaking. The success of the prosthesis largely depends on its proper fit, which is essential for ensuring greater patient compliance.

2. Case History

A 50-year-old male patient reported to Department of Prosthodontics and Crown & Bridge referred from Department of Oral Surgery, Sri Siddhartha Dental college Tumkur with chief complaint of Oro nasal communication and failed PMMA flap surgery. Patient gave history of squamous cell carcinoma for which he had undergone hemi maxillectomy of first quadrant followed by reconstruction with PMMA FLAP surgery which failed due to improper closure. On intra oral examination it was found to be Armany's classification 4 where the defect crosses the midline and involves both sides of the maxilla, with abutment teeth present on one side, [Fig. 1] and due to the failed scar tissue of the PMMA flap, there was considerable deviation of mandible towards left and on assessing the occlusion, there was no contact on posterior unresected teeth.

Fig. 1 Pre-Restorative Inta-Oral Image Depecting the Hemi-Maxillectomy Defect (Armany's Class Iv)

Various treatment options were given to patient :1) Fixed resection of failed flap surgically and placement of immediate obturator followed by Prosthetic rehabilitation with zygomatic implants. 2) Resection of failed flap surgically followed by immediate obturator and definitive removable prosthesis for mandible. After evaluating all pros and cons of the treatment modalities patient opted for the later one.

When the patient reported for fabrication of immediate surgical obturator, an impression was made. The cast was scored, a heat cure surgical obturator was fabricated and inserted [Fig. 2].

Fig. 2 Surgical Plate was Fabricated with Heat Cured Acrylic and Inserted on the Day of Surgical Excision

After 4 weeks when patient reported for definitive obturator, we were able to observe there was restricted mouth opening due to the fibrosis of the PMMA flap.

So after 2 weeks, a new alginate impression was made along with the defect, and a diagnostic cast was obtained [Fig. 3].

Fig. 3 Diagnostic Impression Made with Irreversible Hydrocolloid

Border molding was done with low fusing compound along with a final impression was made with elastomers and a master cast was obtained. Bite registration was done. Casts were mounted on the semi-adjustable articulator.

Teeth arrangement was done in such a way that twin occlusion was given on unresected side such that the mandibular teeth occludes with acrylic teeth and conventional cusp to fossa arrangement on the left resected side.

Another occlusal extension was made buccally on the mandibular posterior side (Right side) i.e. acrylic table with teeth arranged on which the maxillary posterior teeth occludes for better chewing efficiency. This removable prosthesis was tooth supported with the help of Adams clasp for retention [Fig. 4].

Fig. 4 Occlusal Table was Fabricated on the Mandibular Arch Opposing to the Non-Resected Side to Increase the Occlusal Efficiency

Try in was done. Dentures were acrylized and the bulb was made hollow with lost salt technique [Fig. 5]. Prosthesis was inserted and checked for occlusion [Fig. 6].

Fig. 5 Wax-Up And Acrylization Of The Prosthesis

Fig. 6 Final Insertion of the Sectional Obturators

Due to the restricted mouth opening, and considering the bulb size, we planned two sectional prostheses, one on the non-resected side for twin occlusion and another on the resected side with the acrylic teeth. Both the sections were connected with Press-buttons one in anterior and in posterior that aids in retention and holding them together [Fig. 7].

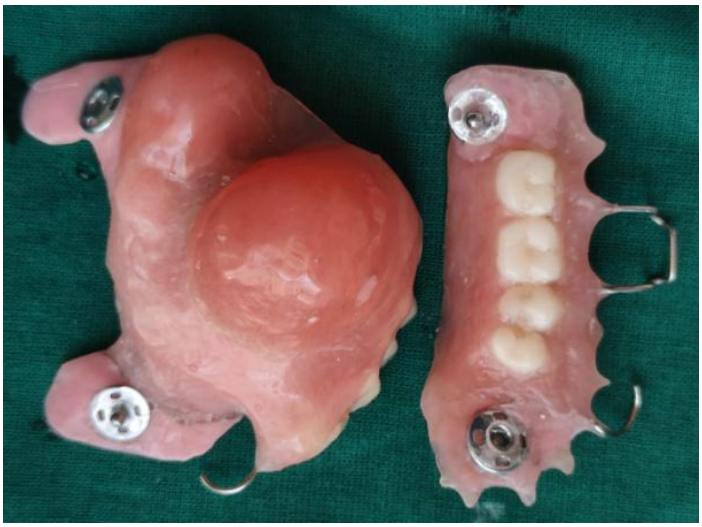

Fig. 7 The Sectional Obturators Showing the Two Parts , One Containg the Bulb on Resected Side and Another Twin Occlusion Provided on the Non-Resected Side and Connected with Press-Buttons One in Anterior and in Posterior

At the follow-up, the patient reported no issues and the hygiene instructions were given. The patient was then scheduled for a routine recall.

3. Discussion

Maxillofacial defects significantly impact the patient's overall quality of life. Addressing these issues through appropriate prosthetic solutions is essential for restoring both function and appearance. Prosthodontic rehabilitation gets more complicated when patient fails follow up ultimately leading to significant mandibular deviation and loss of occlusal contacts on the opposing side.

Due to the buccal flap fibrosis, the challenge in this present case is that, the mouth opening was restricted (20mm) which hampered the prognosis of the prosthetic treatment, hence a modified treatment plan was formulated with twin occlusion on the non-defective side which increases the masticatory efficiency for the patient. The two parts were joined with the help of press-buttons for easy removal, placement and cleaning. Use of hinge to join the segments would have been difficult considering the size of the hollow bulb.

Due to the deviation of mandible, and to establish the occlusion on both the sides, an additional row of teeth was placed on acrylic table in mandible opposing the non-resected side, so that there is occlusion is achieved that increases the masticatory table.

According to the Armany's Classification proposed in 1978, this type of defect is Class IV. Since the defect was large, a hollow bulb obturator was preferred to reduce the weight of the prosthesis and to increase the resonance of the voice.

The various materials can be used for fabrication of hollow bulb obturator prosthesis such as light polymerizing resins and cast partial dentures. On the other hand, the use of heat cure polymer increased the durability, esthetics and patient compliance.

Advantages includes rehabilitation with an obturator prosthesis is functional, reliable/safe, easy to build and has a low level of invasiveness.

The limitation includes the use of digital technology, which would have increased the precision but considering the cost factor it was not used.

4. Conclusion

In this case report, patient reported with a hemi-maxillectomy defect with fibrosis of buccal flap which had failed eventually resulted in trismus. An extra effort should be given to increase the masticatory efficiency to increase the overall health of the patient.

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