



Case Report

Immediate and interim prosthodontic management of post-surgical maxillectomy patient using obturator prosthesis: A case report

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ARTICLE INFO

Article history:

Received 12-09-2021

Accepted 30-09-2021

Available online 27-01-2022

Keywords:

Surgical obturator

Interim obturator Hemimaxillectomy

Squamous cell carcinoma

ABSTRACT

This clinical report describes a comprehensive prosthodontic treatment of a young patient diagnosed with squamous cell carcinoma in hard palate. The treatment procedures included surgical removal of the tumor, immediate surgical plate and interim obturator. The surgical plate and interim prosthesis were fabricated using conventional polymethyl methacrylate resin material with retention derived from wrought wire clasps to the remaining natural teeth. The follow-up system revealed satisfactory results with no deterioration in the prosthesis.

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1. Introduction

Oral carcinomas are the fifth most common carcinoma worldwide.¹ The course of the disease and its management has a huge effect on psychological and functional wellbeing of the patient.² Oral cancer management involves many treatment modalities like surgery, radiotherapy and chemotherapy etc. Besides the elimination of the carcinoma, regaining the patient's aesthetics and oral function which was lost or altered is also of prime importance.

Primary oncology surgery can impede prosthodontic rehabilitative goals. These effects include an altered oral anatomy, compromised soft tissue conditions like missing or scarred tissues, bulky flaps, altered muscle attachments, restricted mouth opening, loss of lip competence, loss of hard tissue such as bone or teeth and alternations in facial profile.³ Rehabilitating such oral defects remains a challenge because of the limitations in management options, commonly due to lack of support or space for the prosthesis, impeded resiliency of soft tissues and loss

of integrity. Studies that have looked into the quality of life of patients post oral cancer surgeries has reported that prosthodontic rehabilitation of lost oral function is of at most importance.^{4,5}

Among the several prosthodontic measures in rehabilitating an oral cancer treated patient, an obturator prosthesis remains widely used by the maxillofacial prosthodontists and well accepted by the patients. This clinical case report describes in detail of patient affected by carcinoma of left hard palate post primary surgery and pre radiotherapy treatment modalities.

2. Case Report

A 38 year old female patient reported to the department of maxillofacial surgery with the chief complaint of swelling in the palatal region. (Figure 1 a) On intraoral examination she presented with a swelling in the left hard palate confined to the posterior maxillary region. (Figure 1b) A discoloured tooth - #21 was also present. Oral hygiene was satisfactory on examination.

Clinical and radiographical examination was carried out. On histopathological examination, carcinoma of palate was

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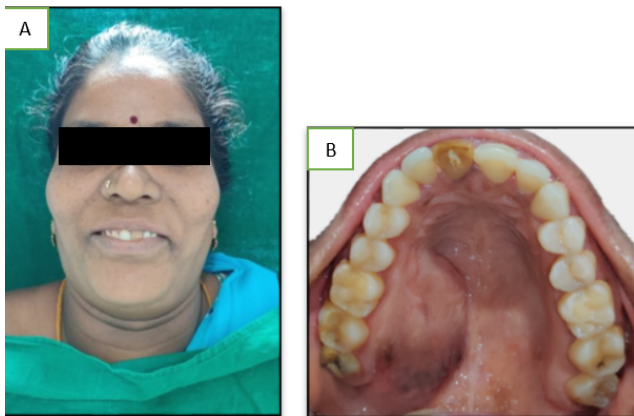


Fig. 1: a-b

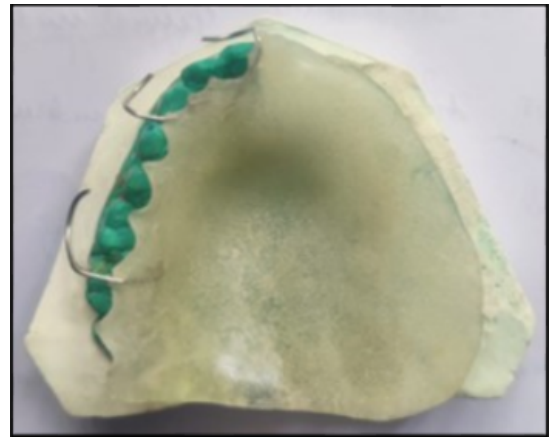


Fig. 4:

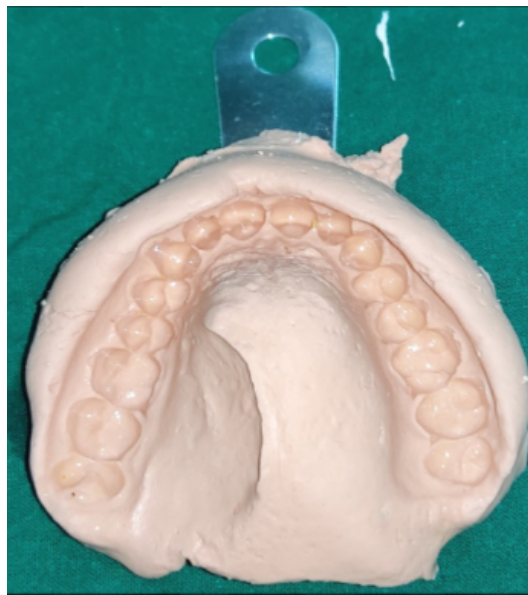


Fig. 2:



Fig. 5:

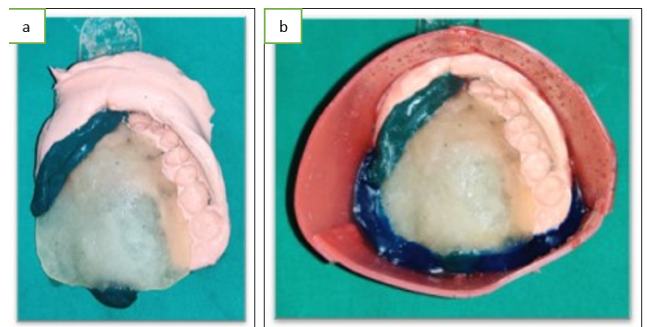


Fig. 6: a-b

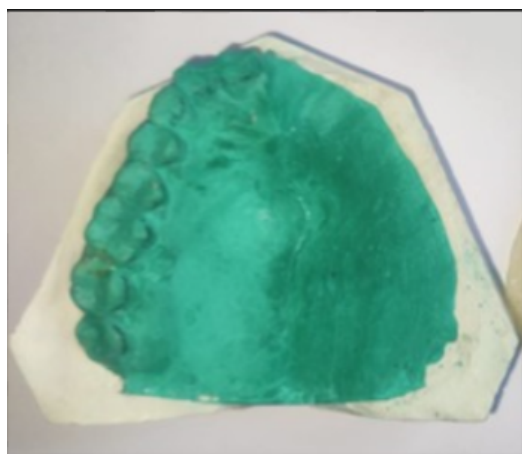


Fig. 3:

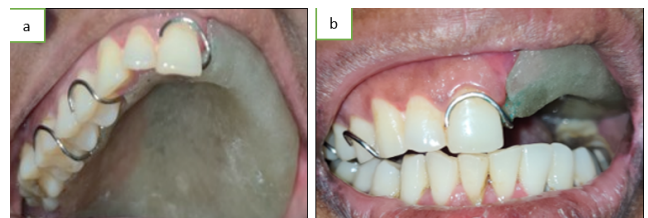


Fig. 7: a-b



Fig. 8:

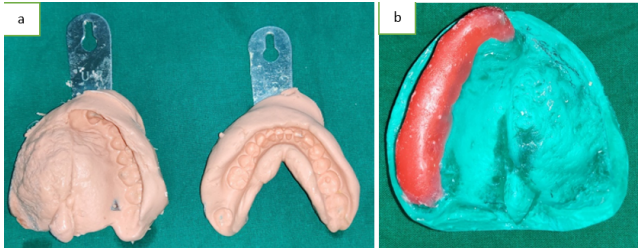


Fig. 9: a-b

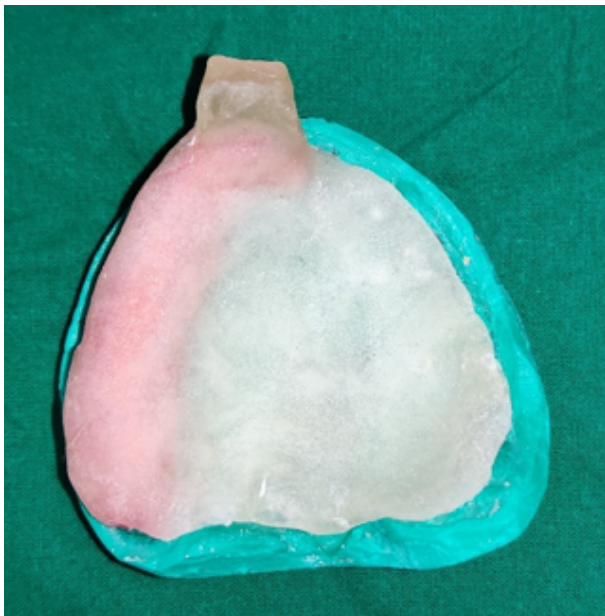


Fig. 10:



Fig. 11:

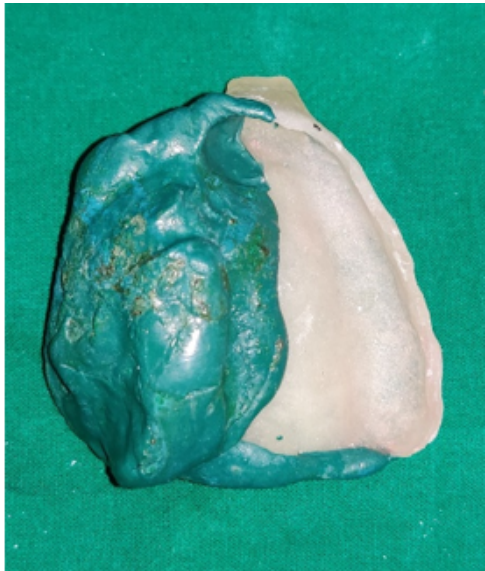


Fig. 12:

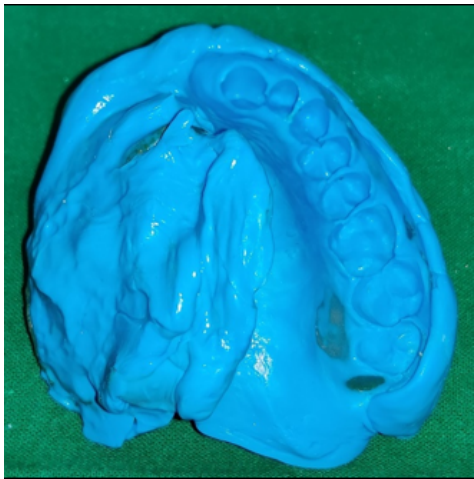


Fig. 13:

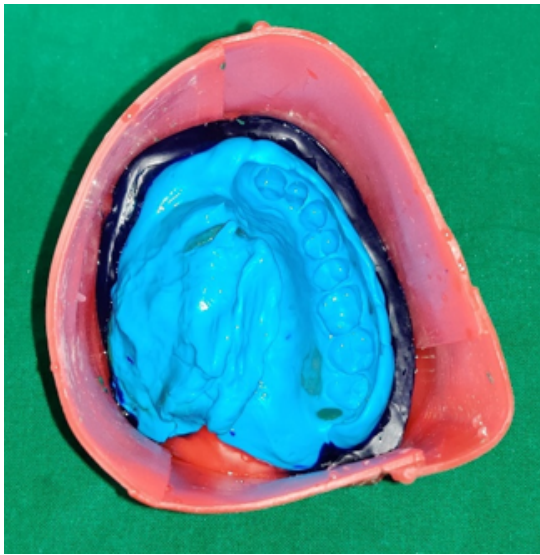


Fig. 14:

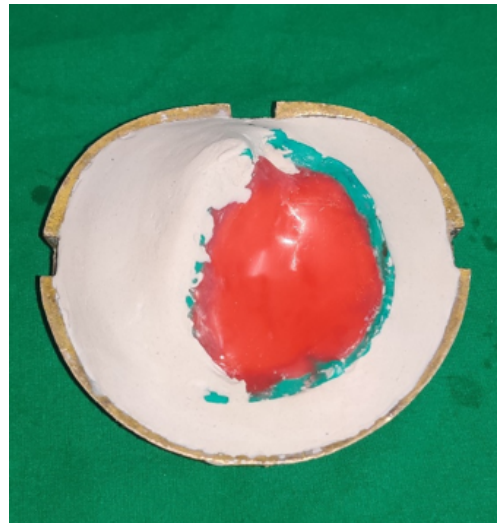


Fig. 17:



Fig. 15:

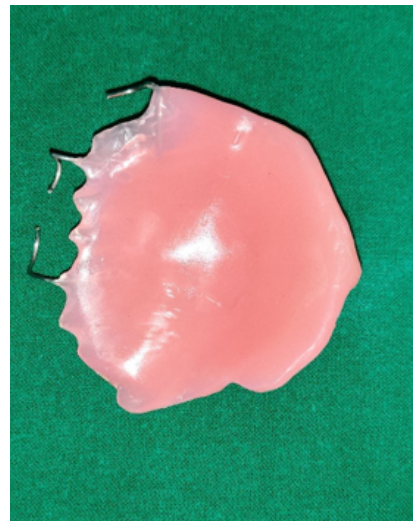


Fig. 18:



Fig. 16:



Fig. 19:



Fig. 20:

diagnosed and the clinical findings were confirmed. The patient was then referred to the post graduate clinics of department of maxillofacial prosthodontics for construction of a surgical obturator / plate.

The pre operative impression was made using irreversible hydrocolloid (Hydrogum 5, Zhermack, Italy) in a perforated dentulous tray. (Figure 2) The impression was poured with dental stone (Gyproc, Prevest Denpro, Jammu, India) to produce the positive template/cast. The area for resection was marked and sent by the surgeon and immediate surgical obturator was fabricated accordingly. (Figure 3)

In the operating room resection of left maxilla was done to remove the tumor and a surgical closure was attempted using the adjacent soft tissues. The surgical obturator was inserted immediately after resection of the left maxilla and held in position using C-clasps on the remaining natural teeth thereby, providing the tripod stabilization for the obturator prosthesis. (Figure 4) One week after surgery the patient was reviewed to rule out complications and proper position of the plate was ensured. The patient presented with a maxillectomy defect extending from the midline to the soft palate in the left side. (Figure 5)

Clinical intra-oral examination showed a hollow remaining with an oro-nasal communication, while the remaining teeth, gingiva and other half of the palate appeared within the normal limits. Lack of oral hygiene may have been due to limited mouth opening and plate in her oral cavity. Extra-oral examination showed a curved profile, an asymmetrical face, no deviation of mandible, no palpable or tender lymph nodes and normal TMJ in function. The defect is under Aramany class I classification. The patient was instructed on removal and repositioning the plate and maintenance a good oral hygiene.

A month later, patient reviewed clinically, intra- and extra- oral examination revealed a good initial healing at the defect site and sutures were evident. The surgical plate was modified by molding the anterior and posterior border

seal using green stick compound (HiFlex, Prevest Denpro, Jammu, India) and a pick-up impression using irreversible hydrocolloid material ((Hydrogum 5, Zhermack, Italy) in a perforated sectional stock tray. (Figure 6a) Beading and boxing of impression was done with modelling wax (Hindustan Modelling wax no:2, India). (Figure 6b) The impression was poured with dental stone (Gyproc, Prevest Denpro, Jammu, India) to produce the positive template/cast. Auto-polymerizing resin was added to seal the borders in the old surgical plate. The modified surgical plate was finished, polished and inserted into the patient's mouth. (Figure 7a & b)

Patient reviewed after 3 weeks prior radiotherapy, the clinical intra- and extra-oral examination was done and healing status of the defect site was re-assured. (Figure 8) The fabrication of an interim obturator was initialized. Maxillary and mandibular impressions were made using irreversible hydrocolloid material (Hydrogum 5, Zhermack, Italy) in a perforated dentulous tray. (Figure 9a) The impression was poured with dental stone (Gyproc, Prevest Denpro, Jammu, India) to produce the positive template/cast and wax spacer was adapted on the remaining natural teeth of the cast for custom tray fabrication (Figure 9b)

A custom tray using auto-polymerising resin (DPI RR Cold Cure Repair Material Powder, India) was fabricated with loop (21 gauge stainless wire) secured in the tray with auto-polymerizing resin. (Figure 10) Border molding was done to seal the defect area confined to the left maxillary palatal region using green stick compound. (Figure 11) The intra oral defect was recorded by engaging green stick compound to the wire loop and the other parts of the custom tray (Figure 12) A wash impression was made in putty and monophase polyvinyl silicone impression material (Aquasil Lv ultra, smart wetting impression, Dentsply, Detrey GmbH, Germany). (Figure 13)

The beading and boxing of final impression was done.(Figure 14). The impression was poured with dental stone (Gyproc, Prevest Denpro, Jammu, India) to produce the positive template/cast. (Figure 15) The usual steps in fabricating the conventional acrylic partial denture were followed. (Figures 16, 17, 18 and 19) The retention for this type obturator was gained from the remaining teeth with wrought wire clasps on teeth 11, 14, 16. The processed interim obturator was inserted (Figure 20). Patient was reviewed for retention and patient comfort after one week, on intra oral examination, the defect site revealed no pathologies due to the prosthesis. (Figure 20) A follow up system will be scheduled three months later, post-radiotherapy and the soft tissue status will be evaluated.

3. Discussion

Rehabilitation of patients with acquired maxillary defects is relatively simpler than rehabilitation of defects in the mandible and pleasing as well as accepted outcomes can be

identified at the end of the treatment. On the other hand, great efforts should be given in dealing with large defects to obtain the substantial requirements for retention and support of the prosthesis.⁶ The infiltrative nature and pattern of squamous cell carcinoma in oral cavity makes it difficult to remove completely, which explains its high recurrence rate and need for radiotherapy.

Prosthetic rehabilitation of maxillary acquired defects could be organized into three stages of treatment. For each step a different type of obturator is fabricated.⁶

3.1. Immediate Surgical Obturator/ Plate

This type of obturator is fabricated from an impression obtained prior to the surgery day and inserted post resection of the tumor. Advantages of using surgical obturator include- 1. Can form a barrier between the oral cavity and wound during the initial healing phase and 2. It enables the patient to speak and swallow more effectively.^{6,7}

3.2. Interim Obturator

Three to four weeks after resection, the construction of interim obturator can be started.⁸ This type of obturator is totally acrylic incorporated with wrought wire clasps engaging the remaining natural teeth for retention. Patient should be reviewed every two weeks as the healing progresses and lining materials can be placed. In this case, fabrication of interim obturator was performed after 4 weeks of surgery. Retention was gained from the remaining natural teeth by incorporating wrought wire clasps.

3.3. Definitive Obturator

Defective obturator should not be constructed unless there is complete healing of the defect site and it is dimensionally stable. It may take up-to 3 to 6 months varying according to many factors.⁹ For this case, a definitive obturator will be scheduled after reviewing the healing status of the defect post radiotherapy.

Quality of life of patients with maxillary defects can be improved by a properly designed obturator prosthesis. These types of obturator can restore mastication, swallowing, esthetics, resonance and speech.

4. Conclusion

A proper diagnosis and a well designed treatment plan will produce desirable outcomes. Rehabilitation with obturator prosthesis always remains to be a functional and effective treatment modality. This paper discussed the prosthetic management of acquired maxillary defect prior to radiotherapy using an obturator prosthesis.

5. Informed Consent

The authors certify that the patient has given her consent for use of her images and other clinical information to be used

in the journal. The patient is also informed and understands that her name and initials will not be published and due efforts will be taken to conceal her identity.

6. Conflicts of Interest

The authors declare that there are no conflicts of interest regarding the publication of this paper.

7. Source of Funding

None.

References

1. Goon PK, Stanley MA, Ebmeier J, Steinsträsser L, Upile T, Jerjes W, et al. HPV & head and neck cancer: a descriptive update. *Head Neck Oncol.* 2009;1:36. doi:10.1186/1758-3284-1-36.
2. Korfage A, Schoen PJ, Raghoobar GM, Bouma J, Burlage FR, Roodenburg JL, et al. Five-year follow-up of oral functioning and quality of life in patients with oral cancer with implant-retained mandibular overdentures. *Head Neck.* 2009;33(6):831–9. doi:10.1002/hed.21544.
3. Nayar S. Current concepts and novel techniques in the prosthetic management of head and neck cancer patients. *Br Dent J.* 2019;226(10):725–37. doi:10.1038/s41415-019-0318-3.
4. Kamstra JJ, Jager-Wittenaar H, Dijkstra PU, Huisman PM, Van Oort RP, Van Der Laan BF, et al. Oral symptoms and functional outcome related to oral and oropharyngeal cancer. *Support Care Cancer.* 2010;19(9):1327–33. doi:10.1007/s00520-010-0952-4.
5. Vosselman N, Alberga J, Witjes M, Raghoobar GM, Reintsema H, Vissink A, et al. Prosthetic rehabilitation of head and neck cancer patients-Challenges and new developments. *Oral Dis.* 2020;27(1):64–72. doi:10.1111/odi.13374.
6. Beumer J, Marunick MT, Garrett N, Rohner D, Reintsema H, Abemayor E, et al. Maxillofacial rehabilitation: prosthetic and surgical management of cancer-related, acquired, and congenital defects of the head and neck. 3rd Edn. Chandler Drive: Quintessence; 2011. p. 155–210.
7. Andrades P, Militsakh O, Hanasono MM, Rieger J, Rosenthal EL. Current strategies in reconstruction of maxillectomy defects. *Arch Otolaryngol.* 2011;137(8):806–12. doi:10.1001/archoto.2011.132.
8. Frame RT, King GE. A surgical interim prosthesis. *J Prosthet Dent.* 1981;45(1):108–10. doi:10.1016/0022-3913(81)90021-4.
9. Keyf F. Obturator prostheses for hemimaxillectomy patients. *J Oral Rehabil.* 2001;28(9):821–9. doi:10.1046/j.1365-2842.2001.00754.x.

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Cite this article: Dhevishri S, Parameswari BD, Annapoorni H, Shankar MSS. Immediate and interim prosthetic management of post-surgical maxillectomy patient using obturator prosthesis: A case report. *International Dental Journal of Student's Research* 2021;9(4):188-193.