Prosthetic rehabilitation of a patient following partial maxillectomy for Squamous cell carcinoma: A clinical report

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Abstract

Squamous cell carcinoma of maxillary alveolar process and palate accounts for 1-5% of all the neoplasms of the oral cavity. This clinical report describes a method for prosthetic rehabilitation of a patient with squamous cell carcinoma of maxilla following partial maxillectomy with a prosthetic obturator.

Keywords: Oral cavity, Obturator prosthesis, Squamous cell carcinoma, Maxillectomy, Hard and Soft palate, Prosthodontic rehabilitation.

Introduction

A considerable number of people each year acquire oral defects as a result of malignant disease, trauma and congenital deformity. Malignant tumors of the upper gum and hard palate account for 1-5% of malignant neoplasms of the oral cavity; two thirds of the lesions which involve these areas are squamous cell carcinomas1. Most of these carcinomas are diagnosed late, when they invade the underlying bone.

Treatment options include surgery, radiation therapy, and chemotherapy2. In recent years, newer treatment options such as cryotherapy, immunotherapy, cytotoxic treatment, photodynamic treatment, and hypothermal treatment have been used in conjunction with conventional treatment methods for head and neck cancers3. However, most of these methods result in unwanted or incapacitating defects requiring immediate short- or long-term management and rehabilitation procedures.

The term maxillectomy refers to partial or total removal of maxilla in a patient suffering from benign or malignant neoplasm4. The resultant surgical defect often includes part of hard and soft palate, which results in an oro-antral and/or oro-nasal communication5.

Rehabilitation can be accomplished either surgically (free flap transfer) or prosthetically (obturator)5. The choice of rehabilitation depends upon the site, size, etiology, severity, age, and the patient’s wishes. However, age, general medical condition of the patient, radiation therapy, anatomic complexity, possibility of recurrence, appearance of the area to be rehabilitated, complexity of the surgical procedure, and the patient’s refusal to undergo further surgery may contraindicate surgical reconstruction.

Maxillary obturator prosthesis is more frequent treatment modality than surgical reconstruction due to ease of fabrication and maintenance6-9. The prosthesis recreates a partition between oro and naso-pharynx and facilitates improvement in mastication, deglutition and speech intelligibility6,10.
The traditional treatment sequence for a patient requiring a maxillectomy is the initial insertion of an immediate surgical obturator at the time of surgery or soon thereafter, and an interim obturator used after initial healing until the tissues are stabilized (approximately 3 months), and a definitive obturator prepared after the tissues have stabilized, with few appreciable changes. Many different materials have been used for the fabrication of the obturator. Silicone rubber, although advantageous in certain clinical situations, is porous in nature and has poor long-term durability, requiring replacement on a routine basis. Visible light-polymerized resin has also been used; however, maximal strength and long-term durability of these obturators have not been assessed. Heat-processed acrylic resin has been proven to be one of the most durable, tissue-compatible materials to date for the fabrication of this prosthesis.

Case report
A 60 year old lady was surgically operated for the squamous cell carcinoma of a right maxilla in SKIMS Soura, Srinagar. She was referred to the Department of Prosthodontics, Government Dental College Srinagar, India. Medical and dental history revealed surgical resection of the anterior and right posterior maxilla and corresponding alveolar bone due to T3N2M0 squamous cell carcinoma 4 months ago. Intraoral examination revealed well healed surgical defect creating an oro-antral communication (Figure 1). All the remaining maxillary teeth and complete mandibular dentition were examined clinically as well as radiographically and found to be caries-free with no significant gingival/peridontal problems. Masticatory, phonetics and esthetics of the patient were severely affected due to missing maxillary structures. The patient was diagnostically classified as ‘Class IV (severely compromised) clinical situation’ according to the Prosthodontic Diagnostic Index (PDI) described by McGarry et al. Various modalities of prosthetic reconstruction were discussed with the patient and the patient indicated a desire for an economical solution. Hence, heat-polymerizing resin prosthesis was planned, and the expectations of this prosthesis were explained to the patient.

Treatment
Impression making was difficult as there was limited mouth opening and the tissues on the operated side were taught and lacked normal flexibility. There was difficulty in inserting the tray. The stock metal tray was modified with modeling wax for support of the impression material (Figure 2). Impression of the defect was obtained using alginate. The removal of the tray along with impression of whole defect area were challenging and technique sensitive. The impression was poured and undercuts were blocked using modeling wax (Figure 3). Final impression (Figure 4) was made using putty and light body elastomeric impression material. The secondary impression was poured in die stone and undercuts were blocked and a duplicate refractory cast was made. Pattern wax was adapted on this refractory cast and casting was done to obtain the metal framework (Figure 5). Wax occlusal rim (Figure 5) was made and bite registration was done. Teeth arrangement was done in accordance to the existing occlusion (Figure 6). After teeth arrangement the waxed up obturator was tried in the patient’s mouth. Occlusal contacts and fit is verified. Flaking of waxed prosthesis was done and the wax was eliminated (Figure 7). The defect and the framework was lined with approximately 2 mm thick layer of heat-cure resin. The center of the defect was then filled with table salt to fill the concavity created by the perivous step, then another layer of heat-cure resin was placed to within approximately 2 mm on the top (Figure 8). Mold was packed with heat-curing acrylic resin in the usual manner. Processing of acrylic resin was done according to manufacturer’s specifications. After Deflasking the prosthesis No. 8 bur was used to drill a hole in the superior surface of the obturator to pour out the salt. Auto polymerizing acrylic resin was used to seal the hole made by the bur. Finish of restoration was done in the customary manner. The obturator was then inserted intra orally; fit of the obturator framework was verified and occlusion was checked (Figure 9). The patient was instructed on home care and prosthesis maintenance. To sanitize the wound, the patient was instructed to gently remove any exudates with a wet cotton tip soaked with a 5% Betadine solution and to clean the intaglio (impression) surface of the prosthesis once a day. The patient was scheduled for the first post-insertion adjustment 3 days after the insertion. At the first post-insertion appointment, the surgical wound was observed to ensure health of the tissues, to relieve the prosthesis for pressure areas on the tissue, to compensate for processing changes, and to emphasize hygiene and home care. The patient was placed on a 3-month recall for evaluation and observation of any recurrence.

Conclusion
Malignant tumors of the upper gum and hard palate account for 1-5% of malignant neoplasms of the oral cavity; two thirds of the lesions which involve these areas are squamous cell carcinomas. This clinical report describes a method for prosthetic rehabilitation of a patient with squamous cell carcinoma of the maxilla following partial maxillectomy with an obturator. Rehabilitation restored the separation between the oral and nasal cavities, enabled the patient to swallow, maintained or provided mastication, supported the soft facial tissues, re-established speech and restored an aesthetically pleasing smile.

References
Figure 1 Patient with acquired palatal defect

Figure 2 Modified Stock Metal Tray

Figure 3 Primary cast with blocked undercuts

Figure 4 Secondary Impression

Figure 5 Metal frameworks with wax occlusal rim

Figure 6 Teeth arrangement in semi adjustable articulator after face bow transfer
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