

Maxillofacial Prosthetic Rehabilitation of Patients with Resection of Squamous Cell Carcinoma: A Report of Two Cases

Abstract

Maxillofacial prosthetic rehabilitation is almost always indicated after surgical treatment of affected individuals with oral cavity and pharynx cancers. Few articles have described in detail the technical sequence of maxillofacial prosthesis fabrication. The first case is a 56-year-old woman who was rehabilitated with pharyngeal obturator prosthesis after a partial maxillectomy, including soft palate, tonsil, oropharynx, and retromolar space regions. The second case is an 83-year-old man who was rehabilitated with hard palatal obturator prosthesis after a maxillectomy, including hard palate and nasal floor. In both cases, the patients complained of oronasal regurgitation and difficulty in chewing, swallowing, and speaking. A multi-professional approach including oral rehabilitation should be part of the treatment plan for individuals with oral and pharyngeal cancer after tumor resection.

Keywords: Complete denture, maxillectomy, maxillofacial prosthesis, oral and pharyngeal cancer

Introduction

In the US, more than 10,000 deaths from oral cavity and pharynx cancer were expected for 2018.^[1] The picture in Brazil is quite similar.^[2] More than 90% of oral malignancies in the upper aerodigestive tract are squamous cell carcinomas (SCC).^[3,4]

Maxillofacial prosthesis rehabilitation is related to the improvement of quality of life of these patients, but few reports have described in detail the technical sequence of steps for the fabrication of this prosthesis.^[5,6] We described two different types of prosthetic rehabilitation with a maxillofacial prosthesis after tumor resection for SCC in edentulous patients.

Case Reports

Informed consent was obtained from the patients included in the study.

Case 1

A 56-year-old White female, ex-smoker, and ex-alcohol drinker reported missing teeth as the main complaint. Her medical history included a tumor resection in the soft palate, tonsil, oropharynx, and retromolar space regions with partial maxillectomy due to the treatment of

T3N0M0 SCC in 2017. The surgical procedure included left supraomohyoid cervical emptying. She also had a history of total thyroid resection with medication treatment for hormone replacement and had no history of radiotherapy. She was receiving speech-language therapy because of dysarthria, hypernasality, oronasal regurgitation, and oropharyngeal dysphagia and was medically monitored on a quarterly basis.

The patient was referred to the maxillofacial prosthetic rehabilitation service only after the surgical procedure. She was edentulous for approximately 30 years and had been using a complete denture since her complete tooth loss. However, after the surgical procedure, she stopped using her denture because it did not fit anymore, and she was only on a liquid diet. Although a provisional prosthesis may be indicated in some cases immediately after surgery, in her case, prosthesis for immediate use after surgery would not be indicated due to the extension of the procedure to the pharynx, since in this region there is great intensity of both healing and soft tissue modification after surgery.

Clinical examination showed an oronasal communication, good surgical

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wound healing, and good condition of adjacent tissues [Figure 1a]. Rehabilitation with pharyngeal obturator prosthesis with extension to the pharynx was suggested. No preprosthetic surgery was necessary. Initially, an upper and lower primary impression was performed with irreversible hydrocolloid (Hydrogum 4, Zhermack SpA, Badia Polesine, Italy) for the creation of special acrylic resin trays. The upper tray was made with an extension in the pharyngeal area to support the impression material and to obtain an accurate copy of the defect region.

For the final impression, a peripheral sealing was performed using a plastic stick compound to reproduce frenulum and flanges. At the upper edge, an impression with polyvinyl siloxane (Express XT, 3M Espe, Maplewood, USA) was first obtained only in the oral communication to copy and compress the soft tissue that delimits this area. To complete the impression step, each tray was filled with polyether material (Impregum Soft, 3M Espe, Maplewood, USA) after application of the adhesive for adhesion of this material to the tray [Figure 1b]. The greatest difficulty of this rehabilitation is to obtain the correct delineation of the defect area and the deviation of adjacent muscles to copy the basal area to promote both retention and stability of the prosthesis.

After the impression, stone casts (Durone IV, Dentsply Sirona, New York, USA) were obtained, on which acrylic resin record bases were made. The record bases were placed on the patient's mouth to determine the vertical dimension of occlusion, as well as the smile height and the position of the median line [Figure 1c]. The record bases were transferred to a semi-adjustable articulator for later tooth assembly.

In the next session, the patient performed the try-in procedure to check occlusion and esthetic and functional details [Figure 1d]. In this session, labial profile, molar occlusion, and nasal speech presence were evaluated. The

patient was instructed to pronounce high-pressure oral sounds and was also subjected to the test of drinking a glass of water to check if there was passage of fluid from the mouth to the nose, and thus, if the prosthesis was satisfactory. The prosthesis should approach the posterior pharyngeal wall to avoid hypernasal speech and fluid passage.

The complete denture with pharyngeal bulb prosthesis was finalized and installed [Figure 1e and f]. Occlusal adjustment was performed and the patient returned to follow-up After 6 and 12 months. She was satisfied with her complete denture and was able to eat solid food.

Case 2

An 83-year-old White male reported speaking and chewing difficulty as his main complaint. His medical history included arterial hypertension controlled by medication and a partial left maxillectomy, including hard palate and nasal floor, because of surgical treatment of SCC in 2016. The patient had a late diagnosis, with cancer staging as T4N0M0. He was submitted to adjuvant radiotherapy treatment with a high-dose rate (5400 cGy on tumor margin and 6000 cGy on primary tumor bed). The patient remains under biannual medical monitoring but is not receiving speech-language therapy.

Clinical examination showed both intra- and extra-oral tissue loss, oronasal communication on the left side [Figure 2a], atrophic ridge, good condition of adjacent tissues, oronasal regurgitation, and xerostomia. The patient lost muscle tissue and part of the lip, with consequent esthetic disharmony, showing more teeth on the left side.

Rehabilitation with palatal obturator prosthesis was suggested. Initially, an upper and lower primary impression was performed with irreversible hydrocolloid for the creation of a special acrylic resin tray. For the final impression, a peripheral sealing was performed using a plastic stick compound to reproduce frenulum and flanges.

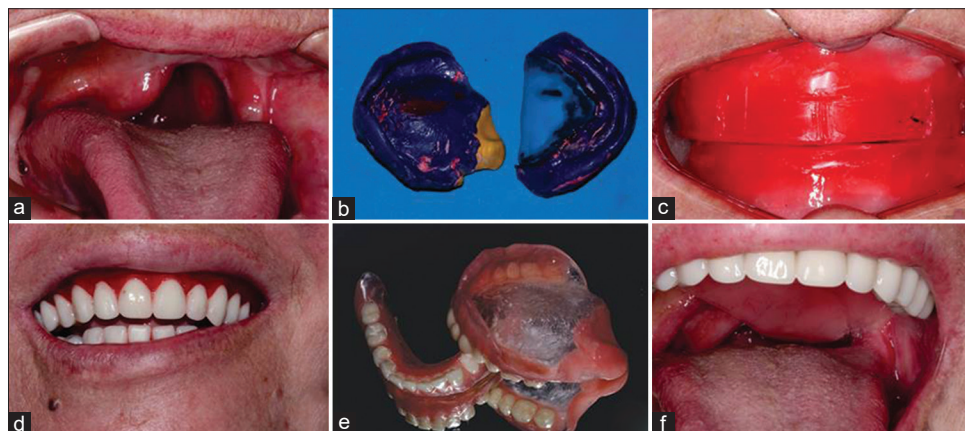


Figure 1: (a) Intraoral view of oronasal communication in the pharyngeal region. (b) Upper and lower mold. (c) Intermaxillary registration. (d) Try-in procedure to check esthetic and functional details. (e) Complete denture with pharyngeal bulb prosthesis. (f) Intraoral view and patient's smile while wearing pharyngeal bulb prosthesis

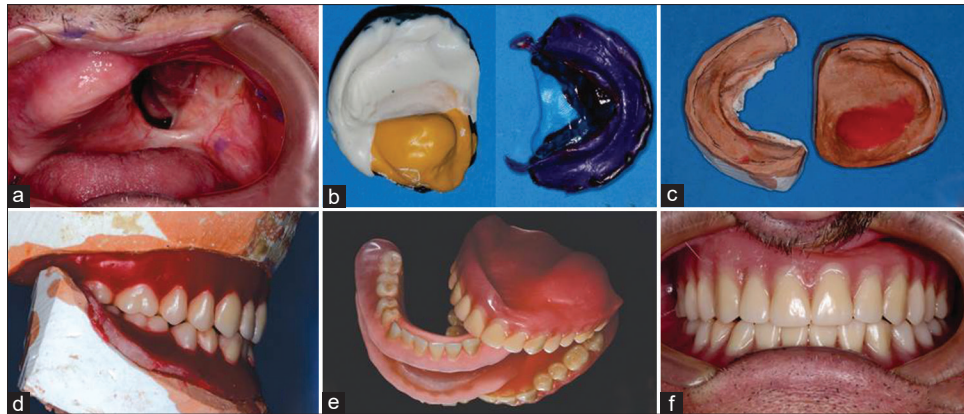


Figure 2: (a) Intraoral view of oronasal communication in hard palate and alveolar bone. (b) Upper and lower molds. (c) Dental plaster casts. (d) Artificial teeth occlusion in centric relation position. (e) Obturator complete denture. (f) Intraoral view and patient's smile while wearing obturator complete denture

At the upper edge, an impression with polyvinyl siloxane (Express XT, 3M Espe, Maplewood, USA) was first obtained only in the communication region to copy and compress the soft tissue that delimits the communication, and then, an irreversible hydrocolloid (Hydrogum 4, Zhermack SpA, Badia Polesine, Italy) was used to complete impression. The lower impression was performed with polyether material (Impregum Soft, 3M Espe, Maplewood, USA) [Figure 2b]. After the impression, stone casts (Durone IV, Dentsply Sirona, New York, USA) were obtained [Figure 2c], and intermaxillary registers were performed on the patient and transferred to a semi-adjustable articulator for artificial teeth assembly [Figure 2d].

In the next session, esthetic and functional trials of artificial teeth were performed to check occlusion and additional details of face harmony, with evaluation of labial profile, molar occlusion, and nasal speech presence. The patient was instructed to pronounce high-pressure oral sounds and to drink a glass of water to check if there was fluid passage from the mouth to the nose.

An obturator complete denture was fabricated with thermoplastic material, polished [Figure 2e], and installed in the patient's mouth [Figure 2f]. The patient was also instructed to make use of artificial saliva and denture adhesive because adherence of the prosthesis was compromised due to hyposalivation. It is important to note that the obturator area should not reach the full depth of the defect but should only penetrate about 3 mm, to avoid fluid passage between the nasal and oral cavities. Occlusal adjustment was performed, and the patient returned to follow-up after 2 months. He was satisfied with the prosthesis. However, he was still unable to eat solid food and was only under semisolid feeding.

Discussion

Rehabilitation with a maxillofacial prosthesis may not be sufficient to restore patient's full functionality and esthetics but may assist in the relief of sequelae related mainly to speech, swallowing, and chewing.^[5,7] Surgeries in the

maxillae usually result in oronasal communication, which causes liquid and solid food escape from the mouth into the nostrils,^[6] with the consequent risk of food aspiration while eating.^[7-9] In this respect, a surgical/immediate obturator may have some benefits, by enabling the patient to speak and swallow immediately after surgery.^[5,7,8,10] In Case 1, the confection of a surgical prosthesis could not be indicated due to the resilience of the tissues in the oropharynx region and the great alteration that occurs during the healing process. For Case 2, it would have been possible to fabricate a surgical prosthesis. However, the patient only sought the dental service late, remaining with the old prosthesis he used before surgery.

Oronasal communication, saliva consistency, and bone discontinuity also cause sound distortions such as hypernasality.^[5,7,8,10] Sometimes, rehabilitation with a minimum weight palatal obturator reduces oronasal communication and is sufficient to rehabilitate the patient's speech.^[5,7,10] The association of prosthetic rehabilitative treatment with speech therapy can greatly improve speech.^[5,7] In both cases reported here, the patients were referred to the speech-language pathologist for correct reestablishment of speech. However, the Case 2 had not started this therapy until the last dental appointment.

In cases of edentulous individuals, chewing is the most challenging function to be restored.^[5,6,9] This is a source of concern because diet and maintenance of weight are important for the survival and good quality of life of patients with a history of oral cancer and surgical treatment.^[5,7,8,10] Subjects who underwent radiotherapy and who lost more teeth during surgery most commonly eat a liquid or mashed diet and suffer greater weight loss.^[5] Patients also lose more weight when they are not satisfied with their prosthesis.^[5,6,9] In Case 2, the prosthesis adherence was compromised due to hyposalivation caused by the high dose of radiotherapy. Because of that, he was instructed to make use of artificial saliva and denture adhesive, but unfortunately, this was not enough to permit solid feeding.

In summary, maxillofacial prosthetic rehabilitation for patients with oral and pharyngeal defects arising from tumor resection is a challenge, since each individual has very specific anatomical characteristics of both soft and hard tissues. The treatment should be planned and executed in an individualized manner, with almost artisanal care.

Declaration of patient consent

The authors certify that they have obtained all appropriate patient consent forms. In the form, the patients have given their consent for their images and other clinical information to be reported in the journal. The patients understand that their names and initials will not be published and due efforts will be made to conceal their identity, but anonymity cannot be guaranteed.

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Conflicts of interest

There are no conflicts of interest.

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