Case Report

Prosthetic rehabilitation of a geriatric patient with squamous cell carcinoma of the buccal mucosa: A report of clinical challenges

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Abstract

Objective: This article aims to highlight the rehabilitation of a geriatric patient with an orofacial cheek defect by an extraoral silicone prosthesis.

Methodology: Structured extra- and intra-oral examination of tissues coupled with a justified choice of impression materials, techniques, and prosthetic rehabilitation with a high-temperature vulcanizing silicone was done.

Results: The presence of compressible tissues, static appearance of the prosthesis during patient's facial movements, variability in complexion of the skin around the defect, and manipulating heat-vulcanized silicone were the challenges faced during clinical procedures. Rehabilitation of orofacial defects is a challenge to the maxillofacial prosthodontist due to limited material properties, soft-tissue mobility, compromised retention of prostheses, and poor patient acceptance. The fabrication of a facial prosthesis is as much an art as it is science. Prosthetic form, coloration, and texture of the prosthesis must be indiscernible from the surrounding tissues. Prosthetic reconstruction helps in restoring functional disability and aids in raising the morale of the patient. Prosthetic options of rehabilitation include interim and definitive conventional adhesive-retained or implant-retained prostheses. Initially, vulcanite rubber and acrylic resins were used for reconstruction.

Conclusion: We report clinical challenges during extraoral rehabilitation of orofacial tissues with a silicone cheek prosthesis such as impression making and shade matching during restoration in a geriatric patient. The use of silicone maxillofacial elastomers allowed intrinsic, extrinsic coloring and ease of construction.

Keywords: Cheek prosthesis, extraoral prosthesis, geriatric, maxillofacial, orofacial, silicone, squamous cell carcinoma

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INTRODUCTION

Cancer is a common health issue and is reported to affect over 24.6 million of the world population.[1] Among different types, oral cancer is the sixth most common cancer worldwide and the third most common cancer in both sexes accounting for 69,820 new cases and 47,653

Access this article online	
Quick Response Code:	Website: www.jpionline.org
	DOI: 10.4103/jphi.JPHI_17_17

How to cite this article: Adaki R, Raikar S, Shigli K, Gali S. Prosthetic rehabilitation of a geriatric patient with squamous cell carcinoma of the buccal mucosa: A report of clinical challenges. Int J Pharma Investig 2017;7:107-10.

cancer-related deaths per year in India.[2,3] Treatment of squamous cell carcinoma, one of the most commonly occurring oral cancers, entails a multidisciplinary approach. Maxillofacial rehabilitation after surgical resection remains a huge challenge to the prosthodontist due to limited material properties, soft-tissue mobility, compromised retention of prostheses, and poor patient acceptance.[4]

Prosthetic options of rehabilitation include interim and definitive conventional adhesive-retained or implant-retained prostheses.[4] However, detailed clinical decisions such as impression technique, external form and shade of the prosthesis, prosthesis adaptability, and its retention particularly for an extraoral prosthetic rehabilitation seem to be challenging. This report presents a clinical case of orofacial cheek defect wherein an extraoral maxillofacial rehabilitation was attempted.

METHODOLOGY

A 75-year-old female patient reported to the Department of Prosthodontics with a chief complaint of an opening on the left side of the face and inability to eat and drink. Her medical history revealed surgery for well-differentiated squamous cell carcinoma of buccal mucosa on the left side 6 months earlier with no radiation therapy. The temporalis muscle flap placed on the buccal mucosa of the left cheek failed due to severe cough. Considering her medical condition and age, the flap could not be replaced by surgeons and the defect region was left open.

Extraoral examination revealed an opening of about 3 cm × 4.5 cm radius on the left cheek through which the oral cavity, anterior part of oropharynx, and nasopharynx could be seen. The defect was surrounded superiorly by skin overlying the zygomatic arch, posteriorly by skin overlying the ramus of mandible, and inferiorly by skin overlying the body of mandible. Anteriorly the skin was not supported by any bony structures around it, resulting in more compressible tissues in anterior region. Intraorally, her mouth opening was of about 1–2 mm, with multiple missing teeth in both arches, because of which the patient was unable to chew and speak. The patient was fed through nasogastric tube [Figure 1]. Due to restricted mouth opening and mandibular movements and immovable skin surrounding the maxilla and mandible, an extraoral cheek prosthesis was planned for the patient after obtaining informed consent.

Impression making

The patient was seated in a reclined position with face turned on her right side. The defect was packed with

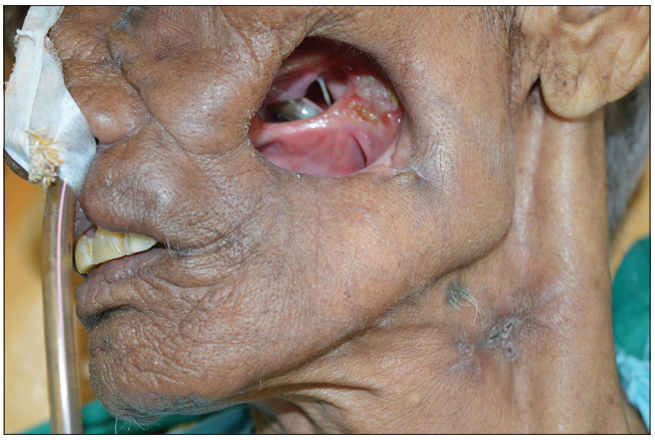

Figure 1: Orofacial defect and structures

lubricated gauze. The light body material (polyvinyl siloxane elastomeric impression material) (3M ESPE Express™ XT Light Body VPS Impression material 3M Deutschland Gmb H, Dental Products, Germany) was injected on the skin surrounding the defect in circular overlapping manner to avoid entrapment of air bubbles. When the light body was set, the putty consistency material (3M ESPE Express™ XT Putty soft VPS Impression material 3M Deutschland Gmb H, Dental Products, Germany) was placed on the light body all over. Superior, inferior, anterior, and posterior surfaces were indicated on putty by marking S, I, A, and P, respectively. This marking was later used as guideline for sculpting of wax pattern. The impression was then retrieved and was poured with type IV dental stone [Figure 2a and b].

To get the texture of the skin, the impression of the contralateral side, i.e., of the right cheek, was made with irreversible hydrocolloid impression material (Tropicalgin, Zhermack, Italy). The impression was poured with type IV dental stone (Pearl Stone, Die Stone Class IV, Asian chemicals, Veraval Industrial area, Rajkot, Gujarat, India) and cast was retrieved. Thin layer of petroleum jelly was applied and self-cure clear acrylic stent (DPI Cold Cure Acrylic material, Dental Products of India, Mumbai, India) was made on this cast.

The prosthesis was waxed (MAARC, Shiva products, Thane, Maharashtra, India) to form taking into consideration the elevations and depressions on the cheek. The sculpted wax pattern was verified on the patient's face at the try-in appointment, and minor corrections to the wax-up were made. Emphasis was laid on proper surface contour and margin continuity. A thin layer of modeling wax of about 1–1.5 mm was applied on the acrylic stent having surface texture of skin. The wax layer was removed carefully and attached on the wax pattern to get the skin texture [Figure 3].

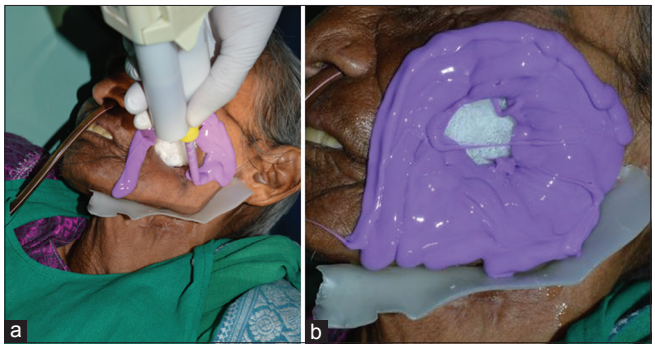

Figure 2: (a and b) Dermostatic impression

Indentations were made on the ledge of the cast and separating medium was applied. The cast with the wax pattern was boxed and counter flask was poured with type III dental stone (Pearl Stone, Die Stone Class III, Asian chemicals, Veraval Industrial area, Rajkot, Gujarat, India). Dewaxing was done.

Shades in different regions were developed chair side according to the lighter and darker areas present on the patient's face. Anteriorly a light-brown intrinsic shade was developed and posteriorly dark-brown shade. High-temperature vulcanized (HTV) silicone (Bredent,GmbH and Co., KG. Senden,Germany) was used for fabrication of prosthesis. Silicone material was packed in the flask. Care was taken to avoid the incorporation of air bubbles in the packed material. The curing was done at 60°C for half an hour. After curing of prosthesis, excess silicone fins were trimmed. The prosthesis was tried on the patient's face for fit, contour, skin texture, and margin adaptation [Figure 4]. The prosthesis was seated on the defect region with the help of tissue adhesive (ProBond adhesive, Technovent, UK).

Instructions regarding the postinsertion care of the prosthesis and tissues were given to the patient. Recall appointments were scheduled for prosthesis follow-up.

DISCUSSION

Cancer of the head and neck region can greatly affect the quality of life (QOL) of patients, as they are constantly reminded of their affliction.[5] The patient's oral intake of food was hampered by the orofacial defect on the left buccal mucosa, and longstanding feeding with nasogastric tube could debilitate her QOL. Long-term feeding through nasogastric tube should be avoided by early resumption to adequate oral food intake.[6] Conditioning of inhaled air by reestablishing nasal breathing is also critical for general health of the patient.[6] Hence, efforts to close the defect were made with a silicone prosthesis.

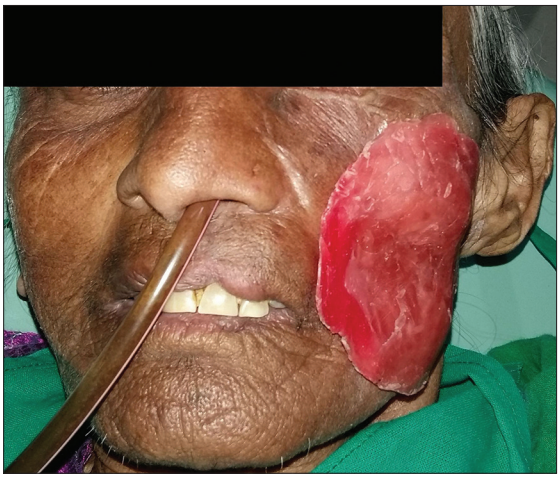

Figure 3: Wax try-in

The surface texture of the external form of the prosthesis was developed with a clear acrylic stent fabricated on the contralateral side. The prosthesis was prepared using silicone material, giving life-like appearance to the prosthesis. The use of silicone maxillofacial elastomers is advantageous as it allows customization, light weight, life-like appearance, ease of intrinsic and extrinsic coloring, tissue compatibility, ease of construction, and dimensional stability.[7] The advantage of using HTV silicones in particular is its high tear and tensile strength; however, it has flaws of poor esthetics and edge strength.[8]

The Indian population has more melanin content; hence, the basic tone is yellowish brown.[9] Intrinsic stains were used for the prosthesis coloration as these are more color stable and provide better esthetic results.

There are many methods of retaining orofacial prosthesis in the literature using magnets[7,10] and elastic straps attached to head cap.[5] However, in the present case, as the skin surrounding the maxilla and mandible was relatively immovable, the prosthesis was retained with anatomical undercuts and tissue adhesive. Since the defect was away from the commissure of the lip, leakage of saliva was not a problem.

Although the maxillofacial prosthesis intended to rehabilitate the defect, limitations such as static appearance of the prosthesis during patient's facial movements on the contralateral side could not be overcome.

Challenges faced during prosthetic construction

One of the challenges faced was impression making. Compressible tissues due to skin with no bone support anteriorly made the procedure of impression of the defect difficult as anteriorly the skin was not supported by any

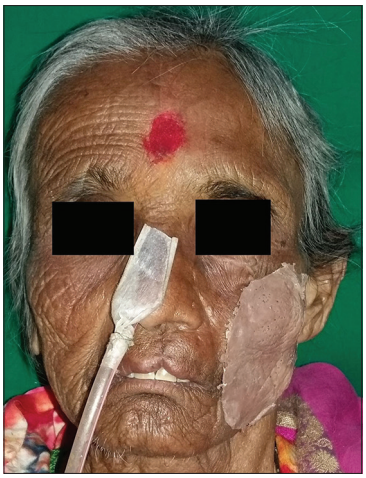

Figure 4: Front view of the patient with prosthesis

bony structures resulting in more compressible tissues. A preliminary impression with putty consistency of vinyl polysiloxane impression material was made and custom tray was fabricated to record the defect with light body. However, the impression resulted in an increased amount of space between the waxed prostheses and the tissues underneath which was overcome by recording the defect with a dermostatic impression using light body consistency material.

The other challenge was in developing the surface texture of the prosthetic cheek to mimic the elevations and depressions of the normal side which was overcome with an acrylic stent fabricated on the normal side.

Matching color of the normal skin using foreign shades was hard as even the darkest shade provided by the company seemed lighter for the Indian skin. In addition, there was variability in complexion of the skin around the defect. Therefore, we incorporated intrinsic colors to achieve a shade closer to the patient's shade.

Retention of the prostheses, however, could be achieved by utilizing anatomical undercuts and tissue adhesives.

CONCLUSION

While it is a challenge to provide a better quality of life to a surgically resected patient through prosthetic rehabilitation, the present case report attempts to highlight the restoration of orofacial tissues with a silicone cheek prosthesis.

Declaration of patient consent

The authors certify that they have obtained all appropriate patient consent forms. In the form the patient(s) has/have given his/her/their consent for his/her/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.

Acknowledgment

The authors would like to thank Dr. Dinshaw Hormuzdi for conducting the surgery. We acknowledge guidance rendered by Dr. K. Chandrasekharan Nair, Dr. Zafrulla Khan, and Dr. Lovely. We would also like to thank Dr. Dayanand Huddar for supporting us while providing patient treatment.

Financial support and sponsorship

Nil.

Conflicts of interest

There are no conflicts of interest.

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