

Case Report

Rehabilitation of a Maxillofacial Cheek Defect with a Double-Layered Epithesis: A Case Report

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Abstract

Patient: A 61-year-old man with full thickness facial cheek defect due to a complication of tissue necrosis occurred after surgical and followed radiation therapy for basal cell carcinoma of the submental region required prosthetic rehabilitation. Apart from the aesthetic concern, he was suffering from other oral debilities such as difficulty in eating, speaking and swallowing. As this type of carcinoma may have a potential risk of morbidity and mortality, it is an obligation of a prosthodontist to treat the patient to have an acceptable and normal social life for his remaining lifespan. The defect was, therefore, prosthetically rehabilitated with a double-layered technique of maxillofacial prosthesis which simulated both intra- and extra-oral tissues. Cosmesil Silicone was used to prepare the epithesis extraorally. The prosthesis was then soft relined using DentuSil Silicone.. The connection of both materials was made with an acrylic element in the mold.

Discussion: This resulted in practically good durability, placement, retention and adaptation of the denture both extraorally and intraorally. The patient reported being satisfied with the function and aesthetics of the epithesis.

Conclusion: This simple alternative approach of a double layered technique may help to improve the aesthetic and function in the reconstructions of patients with facial full thickness cheek defects.

Keywords: Epithesis; Cheek Replacement; Maxillofacial Prosthesis; Mandibular Basal Cell Carcinoma

Introduction

Basal cell carcinoma (BCC) is one of the most common skin neoplasms in humans, taking place for nearly 80% of all non-melanoma skin cancers all around the world [1-6]. The nodular and infiltrative-morpheaform are very common BCC types in the head and neck region; and in combination with the micronodular subtypes are the most aggressive tumors, because of their tendency to infiltrate the deep subcutis, muscles and even bones [2,6]. Although BCC rarely metastasizes

and has a cure rate >95% when diagnosed in early phases, BCC causes significant morbidity and presents an enormous burden to the healthcare system [2,6-8]. Most BCCs are easily treated by combination of surgery and postoperative radiation therapy in their early periods, resulting in local control, a satisfactory long-term functional and aesthetic result offered by both plastic and maxillofacial surgeons, as well as oral and dental rehabilitators [6]. However, in the late courses of the disease, the treatment can be challenging as it is less likely to be effective and more complicated than it is in

the early phase [3,8].

Radiation therapy can be an essential treatment for head and neck cancer in some cases. However, the condition of the operative field is entirely altered after radiation therapy. One of the major and severe complications involves radiation necrosis. The pathogenesis of radiation necrosis follows the “3Hs Theory” proposed by Marx in which radiation induces tissue injury by causing vessel thrombosis (hypovascularity), which leads to hypoxia, and results in cell death of the skin and the underlying structure of the bony element (hypocellularity) including the deep visceral structures [4,9].

This case report details prosthetic management of a patient with a full thickness facial cheek defect occurred after severe and extensive radiation necrosis due to a large dose of radiation therapy for the treatment of an invasive and recurrent basal cell carcinoma of the submental region. After achieving success with the control of the necrotic tissues, the open wound of the cheek was rehabilitated with a double-layered technique of maxillofacial epithesis with Cosmesil Silicone material extraorally and a soft relining material intraorally together attached with an acrylic element.

Outline of the case

A 47 year-old male patient was diagnosed with a BCC lesion of his left submental region at the Hacettepe University, Faculty of Medicine in 2000. The tumor was successfully surgically treated and followed up until 2010. However, the tumor had metastasis to his left cheek area. A multidisciplinary team composed of a head and neck surgeon, radiologist, radiation oncologist, plastic surgeon, and maxillofacial prosthodontist formulated a treatment plan for the patient. Treatment protocol included surgical excision of the tumoral area, closing the wound with flap and followed by radiation therapy. However, severe and extensive radiation necrosis of cheek region of the face because of a large dose of radiation has occurred during course of radiotherapy. The necrotic tissues were successfully controlled; however, full thickness of facial cheek defect has occurred (Figure 1). The patient's chief complaint apart from the aesthetic concern was oral debility like difficulty in speaking, eating and swallowing. A maxillofacial epithesis was planned to the patient as no further surgical operation could be performed to the exposed area due to the severe radiological complication. After a complete diagnostic work-up, the decision was made to fabricate the epithesis with a double layered technique as the silicone rubber could only be used for extraoral applications and easily be deteriorated because of the intraoral liquids. An intraoral silicone DentuSil (Dentu Sil Bosworth Company, Illi, USA) was selected to soft reline the epithesis.

Procedure

Impression of the defect site was made using vinyl polysiloxane material (Elite HD+; Zhermack SpA, Italy). The impression device was assembled and the impression material was placed over the cheek area with the help of a mixing tip. After the impression material was set, cast model was prepared with type IV dental stone (GC Fujirock EP; GC Europe, Belgium). First, the middle portion of the denture was made on the cast model using autopolymerizing acrylic resin (Figure 2). Then, wax model simulating the cheek area was prepared. Evaluation of the wax model was done clinically and confirmed; then the wax model was placed in the mold (Figure 3) After the burnout procedure, the model was isolated, silicone material (Cosmesil M511, Principality Medical, Newport, UK) was mixed and colour pigments were added. During the preparation of silicone rubber, the acrylic middle portion was also kept in the mold. Mold then closed, clamped in the conventional way, and placed in a dry heat oven at 100°C for 1 hr. After polymerization, the denture was carefully removed from the mold and flash was trimmed away with a sharp scalpel. The prosthesis was painted and finished (Figure 4). The epithesis was then placed over the cheek region and controlled. For intraoral usage, the epithesis was soft relined with DentuSil soft reline material. Inside of the epithesis was filled with DentuSil and placed in the defect site (Figures 5-7). After a setting time of 5 min., the epithesis was removed and trimmed (Figure 8). The adjustments were made, the prosthesis was polished and reinserted (Figure 9). The patient was instructed in the insertion and removal of the epithesis and on home care and prosthesis maintenance. At 1 month of follow-up after prosthesis delivery, the patient reported being satisfied with the aesthetics and function of the double layered maxillofacial cheek prostheses.



Figure 1. Patient with a full thickness facial cheek defect.



Figure 2. Middle portion of the denture.



Figure 5. Soft relining material - DentuSil.



Figure 3. Acrylic element was placed in the mold.



Figure 6



Figure 4. Extraoral portion of the prosthesis was prepared using Cosmesil.



Figures 6 and 7. Soft relining material was placed over the defect site.



Figure 8. Complete epithesis.



Figure 9. The prosthesis was placed over the defect site.

Discussion

Loss of facial structures has substantial functional and aesthetic consequences. Alone or combination of free tissue transfer, local flaps and/ or maxillofacial prosthesis may help to achieve the form and the function of the native tissue that patients desire [10-12]. Because of the length and complexity of the surgical procedures, placement of a maxillofacial prosthesis has been a conventional and reliable method in obturating the facial defects. Prosthetic rehabilitations can be preferred where surgical procedure is not possible in the short or long term treatments of maxillofacial defects [10,13,14]. In this article, the process for fabrication and construction of a facial cheek prosthesis by use of simple available materials such as silicone and acrylic materials was described. This was fabricated and

delivered to the patient within a week to achieve the objectives outlined. Prosthetic rehabilitation of the maxillofacial tissue with epithesis is invasive, less expensive and can be done almost immediately after primary healing of the surgical site or necrotic tissues. The fabrication of the epithesis is relatively simple and aesthetically better. It also provides the clinician with easy access to monitor recurrence of the disease. One of the disadvantages of the epithesis is that it is removable and could affect the patient's perception of body image. Other disadvantages include the consistent need for future remakes owing to the deteriorating color and marginal tearing of the silicone material [9-15]. However, as the palliative dental care's main focus is to re-establish the quality of the remaining life, in addition to the alleviation of physical and psychological suffering of the far-advanced disease patients, this goal was fully achieved for this patient [15].

Conclusion

The patient was satisfied with the double layered maxillofacial prosthesis in terms of functional, aesthetical and physiological aspects. Within the limitations of this clinical report, this simple alternative approach of a double layered technique may help to improve the aesthetic and function in the reconstructions of the patients with facial full thickness cheek defects.

Conflict of Interest (COI)

The authors declare that they have no competing interests.

Consent

A fully informed consent has been obtained from the patient.

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