

Early Rehabilitation of Facial Defects Using Interim Removable Prosthesis: Report of Two Clinical Cases

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Postsurgical facial defects often pose a challenge to patient rehabilitation. Such defects can have a severe adverse effect on patient perceptions of body image and self-esteem. When immediate surgical repair of the defect is not feasible, an interim removable facial prosthesis may be considered. This prosthesis can be fabricated and placed as soon as several days after surgery to provide a cosmetically acceptable appearance, permitting the patient to more comfortably and confidently resume social interactions during the postoperative healing period. This article presents two case reports describing the use of interim facial prostheses to provide rapid patient rehabilitation.

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Surgical resection of neoplasms or malformations of the face may result in defects that are not amenable to immediate surgical reconstruction. In these cases, the use of an interim removable facial prosthesis can offer a rapid alternative treatment solution. This prosthesis can be placed soon after surgery to provide a more cosmetically acceptable facial appearance. The patient may then resume social interactions more comfortably while permitting easy access to the facial defect to observe tissue healing while awaiting definitive rehabilitation. The next two clinical cases describe the use of interim facial prostheses in this manner for the rapid rehabilitation of facial defects.

Case Report 1

Interim Nasal Prosthesis

A 68-year-old woman presented to the Zoller Dental Clinics at the University of Chicago for prosthetic evaluation after a rhinectomy and postoperative radiotherapy for a basal cell carcinoma of the nose. The examination revealed a partial nasal resection leaving the bridge of the nose intact (Fig 1). Healing was noted to be progressing well though residual swelling and tenderness persisted. The patient expressed dissatisfaction with her appearance and was especially concerned about attending an upcoming social event because of her facial disfigurement. The patient elected to proceed with the fabrication of an interim nasal prosthesis.

A facial mouldage was made using standard dental impression material to permit the fabrication of a stone cast of the face. A model of the planned nasal prosthesis was sculpted in wax on this resultant cast using the remaining normal anatomic landmarks for reference (Fig 2). An interim nasal prosthesis was processed from the wax model using a medical-grade silicone elastomeric material with extrinsic coloring incorporated to match the surrounding skin tones. White surgical tape was applied to the prosthesis margins in contact with the skin. Healing progressed and anticipated changes in dimensions of the defect occurred, causing a loss of marginal fit of the prosthesis; however, this was easily corrected by adding more tape. Finally, white surgical tape was strategically added to the prosthesis to create the illusion of the patient having undergone a less extensive surgical procedure.

Retention for the prosthesis was obtained using a medical-grade adhesive augmented by the white surgical tape and the close fit of eyeglass frames to the prosthesis at the bridge of the nose



Fig 1. Nasal defect. Note presence of bridge of nose for support of temporary prosthesis.

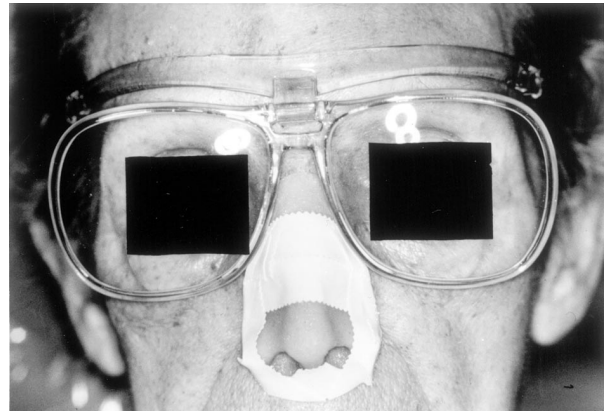


Fig 3. Interim silicone nasal prosthesis. Note use of surgical tape and eyeglasses for added retention and masking of defect.



Fig 2. Wax model of nasal prosthesis on cast.

(Fig 3). The bridge of the nose provided enhanced support for the prosthesis and eyeglass frames. At the subsequent 4-week follow-up appointment, the prosthesis was noted to be functioning well. The patient stated that she was satisfied with the cosmetic result and had felt very comfortable attending the social event while wearing the prosthesis. Definitive surgical reconstruction was scheduled to be performed at a later date.

Case Report

Interim Midfacial Prosthesis

A 50-year-old man was evaluated in the surgical intensive unit facility for prosthetic treatment at the University of Chicago after a midfacial resection performed 5 days earlier to treat a recurrent adenoid cystic carcinoma. This resection consisted of a left total maxillectomy including the adjoining left zygoma, left orbital exenteration, rhinectomy, and upper lip excision. Partial surgical reconstruction of the defect had been performed to partition the



Fig 4. Frontal view of midfacial defect involving the nose, left orbit, and upper lip.

nasal and oral cavities (Figs 4 and 5). The patient elected to proceed with interim prosthesis fabrication to mask the facial defect to permit him to more comfortably interact with family and friends during his postoperative recovery.

A moulage of the face was made and a wax model was created on the resultant cast to fabricate an interim silicone midfacial prosthesis using the same procedures as described in the previous case report. White surgical tape was used to permit easy masking, to anticipate discrepancies in marginal fit as healing progressed, and to create the illusion of a less extensive



Fig 5. Profile view of midfacial defect.

surgical procedure having been performed (Fig 6). Retention of the prosthesis was obtained through the use of a medical-grade adhesive augmented by surgical tape, eyeglasses, and the use of an eye patch over the prosthetic eye and tied behind the head (Fig 7). The patient accommodated the prosthesis well and was discharged to return to his out-of-state home with plans to return for reconstructive surgery after an adequate disease-free period had elapsed.

Discussion

Postsurgical defects of the face can pose a significant challenge to inpatient rehabilitation. Treatment options commonly consist of surgical reconstruction, removable prosthesis fabrication, or some combination of the two modalities. Disadvantages exist for each option that may adversely affect rehabilitation outcomes. Surgical reconstruction of facial defects may be delayed or determined to be inappropriate for some patients. A 3- to 5-month delay after resection is typically required before fabricating a definitive facial prosthesis to allow for sufficient healing and reorganization of the defect to occur to obtain an acceptable long-term fit.^{1,2} Such delays can present a significant hardship for patients with pronounced facial defects and create the poten-



Fig 6. Interim silicone midfacial prostheses with applied surgical tape.



Fig 7. Interim silicone midfacial prosthesis. Note use of eye patch for added retention and masking of defect.

tial for serious adverse psychosocial consequences. The postsurgical fabrication of a custom-sculpted interim facial prosthesis combined with masking agents such as surgical tape and eyeglasses can provide rapid cosmetic rehabilitation, allowing the patient to more comfortably and confidently resume social interactions without the obvious stigma of facial disfigurement.¹⁻³ Because the procedure introduces no trauma to the operative site, fabrication of the prosthesis can commence within several days after surgery, as noted in the second case report in which treatment began on the fifth postoperative day.

In the aforementioned case studies, the problem posed in maintaining the proper aesthetic fit of the interim prostheses subsequent to postsurgical marginal tissue changes was addressed by the placement of white surgical tape along the

margins of the prostheses. Because marginal fit is lost during healing, additional tape can rapidly be applied, eliminating the need for revising the prosthesis. In this manner, effective early rehabilitation can be achieved and easily maintained over time using a more natural-feeling and readily adaptable prosthesis.

The alternative of attempting to continually revise the interim prostheses in response to loss of fit poses significant logistical and technical problems. Prosthetic revisions are very labor-intensive and may require multiple patient visits. Further, it is technically difficult to effectively add new medical-grade silicone material to existing silicone prostheses with the products currently available. Debonding with separation of the newly added silicone material away from the existing prosthesis commonly occurs. Because of this technical difficulty, poly (methyl methacrylate) resins have been recommended as an alternative material for interim prosthesis. New resin can be easily bonded as needed over time in response to postoperative marginal tissue changes.¹ Prostheses made from these resins, however, are rigid and feel much more artificial. Medical-grade silicone materials as used in the aforementioned case reports more closely approximate the viscoelasticity of the surrounding tissues. This resulted in prostheses with a more life-like feel for the patients. In addition, revising methyl methacrylate prostheses still requires significant treatment time.

Because some individuals may demonstrate hypersensitivity to tape adhesive, patients should be closely observed initially to permit early identification of adverse tissue reactions. Marked, persistent contact irritations may require the patient to limit the time during which the prosthesis is worn or to discontinue wearing of the prosthesis. No adverse skin reactions to adhesive tape were observed in either case reported. Patients need to be instructed to remove the prosthesis at least daily to permit cleaning of the underlying tissue. The prosthesis should be removed in the evening before the patient sleeps to further limit the risk of contact irritation of the skin.

When feasible, advanced planning before the proposed surgery can increase the efficiency of this treatment option. Measurements of presurgical facial anatomy and planning discussions between the surgeon and prosthodontist can assist

in maximizing interim prosthetic treatment aesthetic outcomes. Anatomic sites of value in supporting and retaining the prosthesis can be identified and taken into account during surgery. For example, the bridge of the nose typically provides valuable support for a nasal prosthesis as well as for eyeglass frames.³ However, when presurgical planning is not possible, rehabilitation can still rapidly proceed with good results, as seen in the two case studies presented.

Interim prostheses may provide one additional benefit in that they allow for easy access to clinically observe postoperative wound healing and provide additional intervention therapies as needed.^{3,4} Final surgical revisions of facial defects or definitive prosthetic rehabilitation can then proceed at an appropriate pace without the overlay of patient concerns regarding appearance.

Conclusion

Interim facial prostheses offer an option to commence early rehabilitation for patients with significant facial defects who might otherwise be faced with extended periods of disfigurement. Interim prostheses can be rapidly fabricated using soft, silicone materials and placed soon after facial surgery. They can then be easily revised with the use of surgical tape to accommodate for postoperative defect changes arising from marginal tissue healing. They provide a cosmetically acceptable interim treatment outcome, permitting patients to comfortably resume many social activities. Further, they permit easy access to observe wound healing and provide additional therapy as indicated.

References

- 1 Beumer J, Curtis TA, Marunick MT. Maxillofacial rehabilitation: prosthetic and surgical considerations. 2nd ed. St Louis: Ishiyaku Euroamerica; 1996
- 2 Reisberg DJ, Habakuk SW. Nasal conformer to restore facial contour. *J Prosthet Dent* 1990;64:699-701
- 3 Toljanic JA, Lee J, Bedard J-F. Temporary nasal prosthesis rehabilitation. *J Prosthet Dent* 1999;82:384-386
- 4 Cheng AC, Morrison D, Wee AG, et al. 1998 Judson C. Hickey Scientific Writing Award. Maxillofacial prosthodontic management of a facial defect complicated by a necrotic frontal bone flap: A clinical report. *J Prosthet Dent* 1999;82:3-7

Invited Discussion

Ian Zlotolow, DMD

This article by Toljanic et al entitled “Early Rehabilitation of Facial Defects Using Interim Removable Prosthesis: Report of Two Clinical Cases” is an excellent example of two disciplines (plastic surgery and maxillofacial prosthetics) intervening in patients to provide optimal aesthetic outcomes with a multidisciplinary team approach.

The use of interim or postsurgical prosthetic rehabilitation for facial deformity has been used for centuries, i.e., for war injuries, congenital malformation and syndromes, and, most recently, in the past three to four decades after ablative cancer resections.

With the advent of Mohs’ surgical techniques in the 1970s and now, after microvascular free tissue transfers, often the maxillofacial prosthodontist or anaplastologist has been forgotten as a late entry to augment, when needed, the skills of the plastic and reconstructive surgeon.

Toljanic et al present two scenarios in which a simple prosthetic appliance using state-of-the-art technology contributed to the overall well being of the patient. Ideally, when anticipation of a facial defect by the plastic and reconstructive surgeon cannot be totally reconstructed to an acceptable preoperative form and contour, the patient is initially psychologically devastated and/or could have unrealistic expectations. In this scenario, the patient should have a joint consultation with the plastic surgeon, cancer ablative surgeon (head and neck or surgical dermatologist), and the maxillofacial prosthodontist at the time of surgical planning.

Appropriate answers to patients’ and their families’ questions regarding expectations of outcomes could be addressed at the time, thus possibly eliminating low self-image and confronting possible unrealistic expectations upfront. With a multidisciplinary team approach, advantages, disadvantages, risks, benefits, and alternatives should be discussed with the patient before surgery.

The maxillofacial prosthodontist (or anaplastologist) should discuss advantages and drawbacks of silicone and methylmethacrylate resin

material and even take a preoperative facial moulage to use postoperatively, if needed, to reform a more exacting contour of the required nasal and/or facial prosthesis.

Usually, if given a choice between plastic reconstruction and a prosthetic appliance, the patient will often choose reconstruction via their own tissues. Many patients who have had previous surgeries (basal cell carcinomas) via different surgical approaches often misinterpret expectations as explained and discussed by their cancer (ablative) surgeon or plastic surgeon. It is conceived that a “prosthetic replacement” is an “inferior” or, by some, last-ditch “alternative” device.

At Memorial Sloan-Kettering Cancer Center, patients who undergo partial and total rhinectomy are routinely seen for prosthetic consultation preoperatively for potential use of a prosthesis. The possible use of a “surgical” interim prosthesis inserted in the operating room at the end of the surgical procedure or during the immediate postoperative time setting is discussed. In addition to the methods of retention (surgical tape, medical adhesives, and eyeglass frames) that were mentioned and used by Toljanic in these two patients, colorization is applied early and usually provides a realistic effect of the prosthesis. Color match, contour, and form are critically looked on as criteria that establish the prostheses as acceptable to the patients and their families. One advantage of prosthetic rehabilitation is that it is noninvasive and reversible; resculpting is easily performed and new margins are easily attainable.

Maxillofacial prosthodontists and their intervention in restoring facial contours during early rehabilitation are well demonstrated in these two case reports and should be considered an integral component of cancer therapy. The team approach, as practiced at the University of Chicago and other teaching institutions and tertiary cancer centers, is the acceptable “standard of care” in the 21st century. Patients and surgeons anticipating potential use of a maxillofacial prosthesis should have access and availability of a maxillofacial prosthodontist for optional early rehabilitation.

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