Cover Story

Dental considerations and the role of prosthodontics and maxillofacial prosthetics in facial transplantation

Natalie M. Plana, BA; João Malta Barbosa, DDS, MSc; J. Rodrigo Diaz-Siso, MD; Lawrence E. Brecht, DDS; Eduardo D. Rodriguez, MD, DDS

ABSTRACT

Background. Facial transplantation (FT) is a challenging reconstructive endeavor that requires the expertise of a multidisciplinary team. The specific role of maxillofacial prosthodontists has not yet been reported in detail.

Methods. This review considers the contributions of prosthodontists throughout the FT process, from patient selection and dental evaluation to long-term dental rehabilitation of the transplant patient postoperatively. Moreover, considerations of dental management are evaluated.

Results. In the almost 40 FT reported in the literature, the most consistently documented contribution by prosthodontists is the fabrication of a donor mask to maintain donor integrity. Though infrequently reported, prosthodontists have the potential to plan and perform a variety of dental procedures and follow-up plans.

Conclusions. When applicable, facial transplant teams are tasked with providing optimal stomatognathic function and dental occlusion to recipients with severe facial disfigurement. The maxillofacial prosthodontist's contribution is crucial to the long-term dental restoration of the edentulous facial transplant candidate, in addition to the fabrication of the donor mask which fulfills the team's ethical responsibilities.

Practical Implications. Maxillofacial prosthodontists play a pivotal role in facial transplantation, particularly when jaw segments are intended for transplantation.

Key Words. Facial transplantation; facial disfigurement; dental rehabilitation; immunosuppression; donor mask; maxillofacial prosthodontics.

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Facial transplantation (FT) has become a feasible reconstructive option for patients with severe facial disfigurement. However, because each candidate has a unique defect, each procedure poses a different challenge. The complex nature of FT requires the expertise of a multidisciplinary team.[1] Moreover, the surgical team is a dynamic group of specialists and subspecialists that vary on a case-by-case basis. The contributions of an oculoplastic surgeon during a FT that included the eyelids have been previously described,[2] and reports of bone-containing FT have highlighted the role of craniofacial surgeons.[3]

Although less involved intraoperatively, maxillofacial prosthodontists are an important member of the FT team. Their close involvement is of particular importance when the donor or recipient has partially or fully edentulous jaw segments. We describe the role of the prosthodontist during candidate selection, preoperative planning, peritransplant mask fabrication, and posttransplant dental rehabilitation. Furthermore, we briefly review the lessons learned from the short history of FT regarding the inset of bone-containing facial allografts, which preclude functional occlusion and dental rehabilitation.

HISTORY OF ANAPLASTOLOGY AND FACIAL PROSTHETICS

For millennia, prostheses have disguised facial disfigurements that otherwise result in social ostracism. Sixteenth-century reports by Paré[4] describe the design of prosthetic limbs and facial masks for

wounded soldiers. In the early 1900s, Tetamore[5] presented eyeglasses as a prosthetic component for optimal fit, and many contemporaries fabricated new chemical materials to improve appearance. During World War I, advancements in reconstructive surgery lagged behind the high prevalence of severe facial trauma. Consequently, dentists with advanced prosthetic skills provided wounded veterans with a suitable esthetic appearance until surgical intervention became a feasible option, if ever.[6] English sculptor-turned-prosthetist Derwent Wood set the esthetic standards of the time,[7] and dental surgeons developed flexible and durable materials such as silicone elastomers. In the 1980s Brånemark[8] coined the term "anaplastologist" to describe dental technicians/medical artists who worked alongside maxillofacial prosthodontists to fabricate facial prostheses. Throughout history, the aim of facial prosthodontists has been the reintegration of the facially disfigured back into society, whenever surgical reconstruction was unavailable, unsuitable, or refused.

PRETRANSPLANTATION

Candidate evaluation and selection

Early involvement of the prosthodontist in the patient selection phase is useful for determining a candidate's oral health, because dental disease may increase the risk of developing infection in recipients who are immunosuppressed.[9-11] In a survey of US solid-organ transplantation (SOT) centers, 80% of respondents requested a dental evaluation before transplantation; in addition, posttransplantation sepsis from a suspected dental source was acknowledged in 27% of cases.[12] Thus, a thorough dental history should be obtained to identify predictors of noncompliance to preventive and postprocedure oral/dental instructions.[10] SOT evaluations also focus on radiology to identify reduced salivary flow and related pathologic processes and to quantify the risk of developing bleeding and infection related to oral surgery.[13] Active oral/dental disease must be effectively treated before transplantation, because the immunosuppression regimen may increase the risk of developing systemic complications.[10,11,14,15] A care plan should be developed while the patient is on the wait list and should be continued after transplantation.[10,16] As an added benefit, the prosthodontist can complement the teamwide evaluation of the candidate's support system, an important factor in oral health maintenance.[17]

Evaluation of the edentulous candidate for transplantation

Despite the latest advances, edentulism continues to be highly prevalent.[18] Stomatognathic function and quality of life are affected by the absence of functional dentition or lack of adequate prosthetic rehabilitation,[19,20] which may influence the outcome and complexity of oral rehabilitation. The American College of Prosthodontists developed a classification for edentulous and partially edentulous patients, Prosthodontic Diagnostic Index, that considers the main factors to be evaluated[21,22] (Box 1). In partially edentulous patients, main considerations include the location and extent of the edentulous area, the overall condition of abutment teeth, the state of occlusion, and the characteristics of the residual maxillary and mandibular ridges.[21,22]

PERI-TRANSPLANTATION

Donor mask

Unlike other forms of transplantation, facial allograft procurement leaves the donor void of his or her most unique, socially identifying feature. This substantial disfigurement becomes apparent to those who may interact with the donor's body.[23] Fabrication of a prosthetic donor mask offers a humanistic component to the donor's remains and maintains dignity for all involved (Figure 1). Restoring donor integrity is an ethical responsibility among FT teams and is a legal obligation in certain countries.[24] Since the first FT performed in 2005,[25] most teams have adopted this additional step that, should the family desire an open-casket funeral, allows for a respectable appearance of the donor[26-28] (Table 1[1,26,28-37]). It is a relatively easy, inexpensive procedure that does not increase overall operative time and has few, if any, drawbacks.[23,38] Moreover, some argue that donor-likeness restoration may aid in achieving greater social acceptance of FT, because it addresses common public concerns that arise when considering organ donation.[38]

Two main techniques can be used, depending on the preferred materials and workflow. Quilichini and colleagues[29] described a "traditional" method in which an irreversible hydrocolloid impression

ABBREVIATION KEY

CT: Computed tomographic.
FDP: Fixed dental prosthesis.
FT: Facial transplantation.
SOT: Solid-organ transplantation.
3D: 3-dimensional.

Box 1. Summary Prosthodontic Diagnostic Index classification criteria for complete and partial edentulism.*

■ **Complete Edentulism**
- Mandibular bone height
- Maxillary ridge morphology
- Mandibular muscle attachments
- Interarch relationship

■ **Partial Edentulism**
- Location and extent of edentulous areas
- Abutment teeth condition
- Occlusion
- Residual ridge morphology

■ **Complete and Partial Edentulism**
- Oral manifestations of systemic disease
- Maxillomandibular dyskenisia and/or ataxia
- Maxillofacial defects
- Temporomandibular disorders
- Refractory patient

**Source: McGarry and Colleagues.*[21,22]

Figure 1. Image of fabricated silicone mask of a donor's likeness during research allograft procurement exercise.

is created and reinforced by plaster bands. Subsequently, colored acrylic resin is poured into the mold; preoperative photographs of the donor are used to guide coloring after complete polymerization. Silicone elastomer can be used instead of acrylic for mask fabrication; however, it increases manufacturing time and complexity. Advantages of this technique include simplicity and reduced cost. A minor disadvantage is the requirement of immediate bedside fabrication.

Table 1. All face transplantations reported in the literature and type of donor mask fabricated.

STUDY	DATE	LOCATION	SURGICAL TEAM	MASK TYPE
Devauchelle and Colleagues,[26] 2006	November 2005	Amiens, France	Devauchelle and Dubernard	Silicone mask
-	April 2006	Xi'an, China	Guo	Unreported
Quilichini and Colleagues,[29] 2012	January 2007	Paris, France	Lantieri	Resin mask
Pomahac and Colleagues,[28] 2012	December 2008	Cleveland, OH	Siemionow	
Quilichini and Colleagues,[29] 2012	March 2009	Paris, France	Lantieri	Resin mask
Quilichini and Colleagues,[29] 2012	April 2009	Paris, France	Lantieri	Resin mask
Pomahac and Colleagues,[30] 2011	April 2009	Boston, MA	Pomahac	Silicone mask
Quilichini and Colleagues,[29] 2012	August 2009	Paris, France	Lantieri	Resin mask
-	August 2009	Valencia, Spain	Cavadas	Unreported
-	November 2009	Amiens, France	Devauchelle and Dubernard	Unreported
-	January 2010	Seville, Spain	Gomez-Cia	Unreported
Barret and Colleagues,[31] 2011	March 2010	Barcelona, Spain	Barrett	Yes, unspecified
Quilichini and Colleagues,[29] 2012	June 2010	Paris, France	Lantieri	Resin mask
Bueno and Colleagues,[1] 2011	March 2011	Boston, MA	Pomahac	Silicone mask
Quilichini and Colleagues,[29] 2012	April 2011	Paris, France	Lantieri	Resin mask
Quilichini and Colleagues,[29] 2012	April 2011	Paris, France	Lantieri	Resin mask
Bueno and Colleagues,[1] 2011	April 2011	Boston, MA	Pomahac	Silicone mask
Bueno and Colleagues,[1] 2011	May 2011	Boston, MA	Pomahac	Silicone mask
Roche and Colleagues,[32] 2015	January 2012	Ghent, Belgium	Blondeel	Silicone mask
-	January 2012	Antalya, Turkey	Ozkan	Unreported
-	February 2012	Ankara, Turkey	Nasir	Unreported
-	March 2012	Ankara, Turkey	Ozmen	Unreported
Dorafshar and Colleagues,[33] 2013	March 2012	Baltimore, MD	Rodriguez	Silicone mask
-	May 2012	Antalya, Turkey	Ozkan	Unreported
-	September 2012	Amiens, France	Devauchelle and Dubernard	Unreported
Bueno and Colleagues,[1] 2011	February 2013	Boston, MA	Pomahac	Silicone mask
Maciejewski and Colleagues,[34] 2016	May 2013	Gliwice, Poland	Maciejewski	Unreported
-	July 2013	Antalya, Turkey	Ozkan	Unreported
-	August 2013	Antalya, Turkey	Ozkan	Unreported
Krakowczyk and Colleagues,[35] 2017	December 2013	Gliwice, Poland	Maciejewski	Silicone mask
-	December 2013	Antalya, Turkey	Ozkan	Unreported
Bueno and Colleagues,[1] 2011	March 2014	Boston, MA, USA	Pomahac	Silicone mask
-	September 2014	Cleveland, OH, USA	Papay	Unreported
Bueno and Colleagues,[1] 2011	October 2014	Boston, MA, USA	Pomahac	Silicone mask
-	February 2015	Barcelona, Spain	Barret	Unreported
-	May 2015	St. Petersburg, Russia	—	Unreported
Sosin and Colleagues,[36] 2016	August 2015	New York, NY	Rodriguez	Silicone mask
-	June 2016	Rochester, MN, USA	Mardini	Unreported
Makitie and Colleagues,[37] 2016	February 2016	Helsinki, Finland	Lassus	Digital mask
Pomahac and Colleagues,[28] 2012	May 2017	Cleveland, OH, USA	Papay	Plaster cast

Digital methods of mask fabrication are possible through the acquisition of 3-dimensional (3D) surface data of the donor face.[37] The resulting files can be used to either directly print a mask (positive printing) or a mold (negative printing) into which conventional fabrication materials are poured. The main advantage of this method is the ability to transfer impression files to a remote

location with printing machinery, streamlining the fabrication process.[38] Resolution of 3D printing and surface detail may be a limiting factor, depending on the expected distance of human interaction with the donor mask. Although the traditional technique is relatively simple, digital techniques require 3D printing technologies that are relatively expensive and not universally available.

Inset of the bone-containing facial allograft

Ideal positioning of the bone-containing allograft, when indicated, is a critical and challenging step during FT. Surgeons are especially tested by the absence, or severe disfigurement, of the recipient's facial skeletal structures. Difficulty notwithstanding, proper fixation of maxillary, mandibular, and orbitozygomatic structures, in relation to one another and the skull base, is necessary for esthetic and functional success. Improper relations can result in malocclusion[39,40] and can interfere with airway function.[41] Computerized surgical planning and intraoperative navigation have improved the accuracy of FT,[33,42-45] providing maximal cephalometric control during allograft inset. This approach results in adequate functional and esthetic outcomes, supported by cephalometric, vascular, and physiological studies.[46] Preoperative 3D imaging has proven a reliable tool when assessing the facial skeletal anatomy in preparation for an osteomyocutaneous transplant.

Obtaining functional occlusion is a priority for surgical teams, particularly when only 1 segment of the jaw is transplanted; for some recipients, postoperative revisions have been necessary to achieve this difficult goal.[39,46] Detailed surgical planning may reduce the extent of major revisions after transplantation, which increase the risk of developing graft failure and infection.[46] However, by achieving the best possible maxillomandibular relation and eliminating interarch discrepancies, the FT surgical team can provide a reasonable framework for prosthodontists to complete optimal dental rehabilitation.

POSTTRANSPLANTATION

Dental rehabilitation

After transplantation, except for emergency situations, dental treatment should be avoided for 3 to 6 months to allow for adequate healing and therapeutic stabilization of the immune system.[10,15] Immunosuppression can trigger oral manifestations of infectious and malignant disease, setting important limitations/contraindications to dental treatment. This reinforces the recommendation of periodic screening after transplantation, even for completely edentulous patients.[11,47]

The uncertainty of donor anatomy (and thus, final result) delays concrete rehabilitation plans until the posttransplantation stage. As previously mentioned, early awareness of the surgical plan is important, but the prosthodontist truly works on the combination of the donor allograft and the recipient's preexisting structures. At this point, the initial rehabilitation plan may be adjusted as necessary, depending on the variability of the predicted surgical results. Several options are available for prosthetic rehabilitation of complete and partially edentulous patients. Removable dentures are the least invasive restorative option, but they result in the lowest masticatory efficiency, followed by removable overdentures and fixed dental prosthesis (FDP).[48,49] Endosseous dental implants are the standard of care for rehabilitation of edentulous patients[50] and hold promise for FT recipients, despite concerns about long-term immunosuppression.[51]

No evidence suggests that corticosteroid or immunosuppressive therapy are contraindications for dental implantation.[52] However, reduced bone density, increased epithelial fragility, and increased infection risk may compromise peri-implant bone healing and osseointegration.[50-55] Reports on dental implant therapy preformed in recipients of solid-organ transplants are scarce, but they describe overall positive results and excellent long-term follow-up.[50,51,53-56] The only report on oral rehabilitation in FT describes a patient with a maxillary and mandibular full-arch disk-form implant-retained FDP; 2-year follow-up was unremarkable.[49]

Although longer follow-ups and larger study populations are warranted, dental implant rehabilitation appears feasible in patients with immunosuppression. Implant-supported oral rehabilitation in a patient whose facial allograft included maxillary or mandibular bone has yet to be reported. However, positive results in immunosuppressed transplant recipients, in addition to the successful dental restoration of mandibular/maxillary reconstruction patients in whom implants are settled directly in the transferred free fibula, hold promise for FT candidates who require a substantial skeletal component.[57,58]

Box 2. Tests performed during comprehensive, multidisciplinary follow-up appointments.*†

Test/Examination

- CT‡ scan/CT angiogram/angiogram of face
- Electromyography./nerve conduction studies
- Functional magnetic resonance imaging
- Semmes-Weinstein test
- Complete blood count, chemistry, prothrombin time, partial thromboplastin time
- Skin and mucosa biopsies
- Psychosocial evaluations
- Tacrolimus blood levels
- Immunologic laboratory tests (flow, mixed lymphocyte reaction, alloantibodies, Short tandem repeat)
- Dental (periodontal probing, caries, soft-tissue examination)

*Indicates follow-up care should take place for 24 months posttransplant, with the possibility of eliminating the last two months or adding two additional months of follow-up care, as needed by the patient; †The parameters are evaluated at each visit to the transplant center by the appropriate members of the extended transplant team on an every-2-month schedule. Appropriate dental interventions are undertaken dependent on positive findings; ‡CT: Computed tomographic.

The oral maintenance phase of interdisciplinary dental care after transplantation is tailored to the particular needs of each patient who receives a transplant. They are seen ideally for a complete dental prophylaxis, oral hard- and soft-tissue examinations for early detection of caries, periodontal disease, and any oral lesions (that is, signs of graft-versus-host lesions). These appointments are often in conjunction with the standard transplantation-mandated medical follow-up appointments. A detailed list of tests performed during comprehensive, multidisciplinary follow-up appointments can be found in Box 2. With a limited number of active FT centers, these patients' care is oftentimes managed from a far distance, which poses another challenge to quality long-term care. Frequency of visits are patient specific depending on feasibility of travel to FT centers and patients' lifestyles; a comprehensive interdisciplinary evaluation ensues at each visit typically lasting several days, but occurs less regularly with longer periods after transplantation. In cases when recipients' treatment is managed from a distance, receipients may be seen by local dental providers between visits to their tertiary care facility. The local dental care provider would serve as the initial provider should an emergency situation arise, followed by collaboration with the dental professionals on the FT team to develop the management strategy appropriate to each particular situation. Fortunately, no emergent dental situations have been experienced in the 2 patients whose cases we report.

Radiographic examination is performed according to the standard American Dental Association guidelines but modified appropriately for the needs of each patient who receives a transplant. The examinations are performed by the team prosthodontist/maxillofacial prosthodontist. Regular and routine dental prophylaxis are performed by registered dental hygienists under the supervision of the team prosthodontist/maxillofacial prosthodontist. Other dental specialists (endodontists, periodontists, etc.) are consulted when appropriately indicated.

CASE REPORT

Dental management and rehabilitation of 2 total facial transplantation recipients performed by the senior authors (L.E.B., E.D.R.) is detailed below.

Patient 1: Achieving optimal maxillomandibular relationship between donor and recipient structures

Patient 1 experienced a devastating high-energy ballistic injury to the central portions of his face, resulting in loss of his nose, medial zygomas, maxilla, mandible, anterior tongue, cheeks, and lips. A full facial allograft was transplanted, and bony structures included the entire maxilla and mandible and corresponding dentition.[33] Thus, dental evaluation of the recipient truly began after the transplantation was complete.

The donor's dentition was in a healthy state, and computerized surgical planning was used to plan allograft procurement and inset with the maxilla and mandible at occlusion. Despite initial success, anterior displacement of the mandible prompted orthodontic intervention and subsequent LeFort III advancement to restore dental relations 6 months after transplantation.[46] Five years after

Figure 2. Patient 1 4 years after facial transplantation with transfer of maxillofacial hard as well as soft-tissue structures. Retracted closed left lateral **(A)**, frontal **(B)**, and right lateral **(C)** views display xerostomia, development of widespread early changes in dentition consistent with a precarious condition. Also, the patient continues to drift anteriorly in his habitual maxillomandibular relationship. A complete dental prosthetic reconstruction is indicated for this patient.

Figure 3. Patient 2's dental condition after transplantation. Note extensive cervical restorations and recurrent carious lesions. Maxillary anterior teeth are palatally inclined as a result of forces applied from years of perioral scarring.

transplantation, the patient has several dental problems that require attention. First, anterior displacement of the mandible seen initially appears to have recurred, preventing normal dental interdigitation and resulting in flattened incisor occlusal surfaces. In addition, development of caries continues to be an issue despite fluoride treatment and oral health and diet counseling. Increased plaque and caries, however, are likely because of persistent xerostomia that can be medication induced. The patient's dental condition has been closely monitored, and, at this time, full prosthetic dental rehabilitation is indicated (Figure 2).

Patient 2: Dental restoration after burn scar compromise

Patient 2 experienced full-thickness burns to his face, scalp, and neck. As a result, he experienced severe scar contractures throughout his face, particularly in the perioral and periorbital areas, leaving marked deficits in blink function and oral incompetence. Evaluation of this patient before transplantation revealed profound palatal and lingual retroinclination of the maxillary and mandibular teeth, respectively, secondary to perioral contractures. In addition, substantial caries was noted, likely because of prolonged xerostomia and labial incompetence that interfered with adequate dental hygiene. Because his facial skeleton was unaffected by his burn injury, this patient's facial allograft included all soft-tissue structures of the face and scalp and bony anchoring points in the zygomas and chin that also provided esthetic projection in these areas.[36] The recipient's native dentition was preserved during transplantation.

Dental management after transplantation ensued during the revision phase of his FT. Several months after transplantation and after surgical debulking of excess oral tissue, the patient had lip ptosis revealing his mandibular incisors and gums, in addition to continued palatal/lingual dental retroinclination and persistent caries (Figure 3). These factors, coupled with ongoing speech difficulties, prompted the FT team to pursue total dental rehabilitation. Orthodontic management on retroinclined positioning was considered, but it would not have completely addressed the degree of caries and lack of maxillary incisor show relative to the soft-tissue envelope provided by the facial allograft (Figure 4A). Moreover, the palatal inclination of the maxillary incisors was such that orthodontic intervention would have increased the degree of maxillary arch and opened interproximal spaces, producing an unsatisfactory esthetic result.

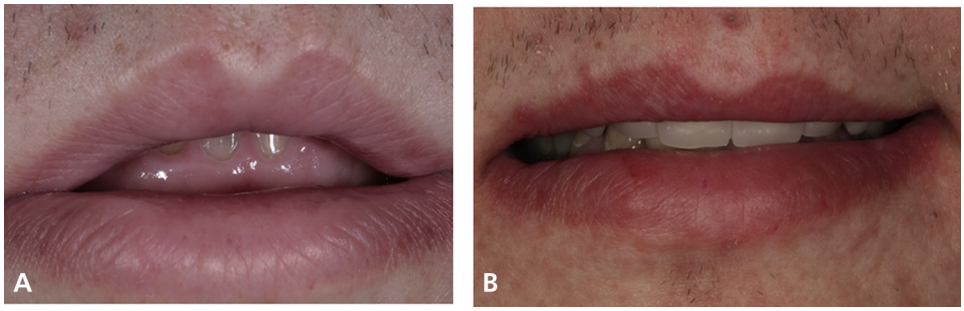

Figure 4. **A.** Patient 2's soft-tissue envelope after facial transplantation displays poor visibility of maxillary incisors. **B.** After prosthetic reconstruction of maxillary dentition, lengthening of maxillary incisors provides appropriate exposure of maxillary incisors. Speech and esthetics confirm appropriateness of restoration parameters.

Figure 5. Patient 2 after placement of final full-coverage restorations to reestablish proper incisor support for lips and appropriate tooth exposure during speech and function. Extensive cervical restorations and recurrent caries also provided absolute indication for full-coverage restorations.

Figure 6. Implant placement in posterior mandible of patient 2.

All maxillary teeth were excavated, and polymethylmethacrylate provisional restorations were placed for a trial period of 3 months (Figure 5). During this time, the patient adapted favorably, and notable improvement in oral function, speech, and esthetic appearance was observed. Mock-up of white wax of the definitive restorations followed, using high-strength ceramic material that achieved lengthening of maxillary teeth by 2 millimeters and maxillary canines by 3 mm. Similarly, posterior mandibular teeth were reconstructed using endosseous dental implants (Nobel Biocare; 8 mm in length, 4 × 3 mm in diameter) because of ongoing caries and lingual retroinclination (Figure 6). After complete dental rehabilitation, superior dental function and appearance have been achieved, highlighting the importance of prosthodontic management to overall FT results (Figure 4B).

FUTURE ROLE OF MAXILLOFACIAL PROSTHETICS/ANAPLASTOLOGY

Progress in FT is limited by the risks of lifelong immunosuppressive therapy and an overwhelming shortage of donors. Furthermore, FT is mostly performed under institutional review board–approved research protocols, which state that candidates are eligible only after multiple autologous

Table 2. Advantages and disadvantages of reconstructive options available to patients presenting with the most severe disfigurement involving structures of the central face.

RECONSTRUCTIVE OPTION	PROS	CONS
Conventional Reconstruction	No immunosuppression	Limited functional and esthetic improvement
		Multiple major surgeries
		Limited donor sites
Vascularized Composite Allotransplantation	Considerable functional and esthetic improvement	Lifelong immunosuppressive therapy
	Single major procedure	
		Psychological impact of new face
Facial Prosthetics	Esthetic improvement while maintaining self-appearance	No functional improvement
	Minor procedures	
		Inert prostheses

reconstructive attempts have failed to achieve optimal function and appearance. Another provision requires that candidates have enough autologous tissues to serve as back-up reconstructive options to ensure that the candidate may at least be returned to his or her pretransplantation state in the event of facial allograft failure. Although quite justified because of the current state of immunosuppressive therapy and donor availability, it seems contradictory that to be accepted as a candidate for FT, a patient must have undergone reconstructive procedures that may well limit their back-up options after transplantation.

Contrary to claims that the role of prosthodontics may be reduced because of FT,[59] it is possible that the field may become even more prominent as limiting factors are gradually addressed. In an ideal future, with access to nontoxic immunosuppressive therapy or reproducible induction of donor-specific tolerance, in addition to an increased supply of organ and tissue donors, it is possible that autologous reconstruction may be limited to initial wound control and coverage using simpler techniques. Therefore, prosthodontics and maxillofacial prosthetics may evolve to serve as temporary esthetic reconstruction for candidates awaiting FT, which would eventually address their esthetic and functional concerns in a permanent fashion. In this scenario, initial free-flap reconstructive attempts would be avoided should the patient opt for transplantation, preserving autologous back-up options. However, in an age of increased patient education and autonomy, it is important that patients understand the risks and benefits of all available treatment options for their facial defects. (Table 2)

CONCLUSION

FT is an evolving reconstructive option that requires multidisciplinary expertise on a case-by-case basis. When maxillary and mandibular segments are included in the facial allograft, the contribution of prosthodontists is important during all phases of transplantation, particularly when restoring recipient dentition. As patients with increasingly complex defects consult for transplantation, allograft designs of matching complexity will achieve reconstruction of facial form. Long-term rehabilitation will require challenging restorative dental procedures, in which the collaboration between reconstructive surgeons and prosthodontists will stretch the limits of available techniques and technologies to improve the function of face transplant recipients; exciting times are ahead. ■

Ms. Plana is a predoctoral research fellow, Hansjörg Wyss Department of Plastic Surgery, New York University Langone Medical Center, New York, NY.

Dr. Malta-Barbosa is a resident, Jonathan and Maxine Ferencz Advanced Education Program in Prosthodontics, New York University College of Dentistry, New York, NY.

Dr. Diaz-Siso is a postdoctoral research fellow, Hansjörg Wyss Department of Plastic Surgery, New York University Langone Medical Center, New York, NY.

Dr. Brecht is an assistant professor, Hansjörg Wyss Department of Plastic Surgery, New York University Langone Medical Center, and an assistant professor, Jonathan and Maxine Ferencz Advanced Education Program in Prosthodontics, New York University College of Dentistry, New York, NY.

Dr. Rodriguez is chair and professor, Hansjörg Wyss Department of Plastic Surgery, New York University Langone Medical Center, 307 E 33rd St. Lower Level, New York, NY 10016, e-mail eduardo.rodriguez@nyumc.org. Address correspondence to Dr. Rodriguez.

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