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Important Functional Aspects on Face Transplantation. Current Literature Review

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ABSTRACT

Patients who suffer severe facial trauma not only face the burden of social isolation due to disfigurement, but they also frequently lose the ability to breathe on their own, eat without the use of substantial accommodations like straws or pureed food, or communicate verbally or through expressions. FT may be beneficial in improving quality of life and may even be able to avert potentially fatal consequences. To overcome the experimental nature of FT and strengthen evidence, future outcome reports should include information on problems and the capacity to smell, breathe, eat, speak, grimace, and feel facial sensations before and after FT. Unfortunately, many data are lacking from these reports.

KEYWORDS: Face transplant, functional improvement, risks.

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INTRODUCTION

A person's life is altered in a number of ways by severe facial injuries. Patients who suffer severe facial trauma not only face the burden of social isolation due to disfigurement, but they also frequently lose the ability to breathe on their own, eat without the use of substantial accommodations like straws or pureed food, or communicate verbally or through expressions. Since a condition of full mental ability frequently coexists with all of these restrictions, face injuries rank among the most challenging impairments that may exist. It's interesting to note that rather than the corresponding sensorimotor functional limitations, the general public may see the evident defiled look of people with severe facial damage as the primary functional defect to be "cured" via face transplantation (FT). However, the sensorimotor functions of the face serve practical objectives, some of which are necessary for survival and others of which are necessary for a sufficient quality of life [1-3].

In 2005, a face transplant was performed for the first time in history in Amiens, France. Since then, over thirty whole or partial face transplants have been recorded from more than six nations, and there may be several more that are still being performed but have not yet been published. The first patient was a 38-year-old lady who had been bitten by a dog and had serious damage to her lips, nose, and cheeks. The initial outcomes of this treatment were astounding, offering hope to patients whose facial abnormalities were deemed "unreconstructible" by traditional means and a medical breakthrough to the entire globe. Since then, a number of further face transplants have been carried out, and the positive outcomes of these instances have also shown the incredible potential for restoring facial function and aesthetics—something that was previously unattainable with conventional reconstructive treatments. But since three transplant patients have passed away, the medical community's once enthusiastic view on face transplantation

has gradually changed to one of caution. The first patient refused to take immunosuppressive drugs, which led to his undetermined death in China; the second patient was a badly burnt individual who had simultaneous bilateral upper limb and face transplantation but passed away from sepsis a month after the treatment. An HIV-positive patient had the third verified fatality following a face transplant due to a tumor recurrence following a prior cancer excision. A number of minor problems, including infections, have been documented in addition to these heartbreaking fatalities. by opportunistic pathogens and diabetes mellitus brought on by steroids. Reconstructive surgeons and patients continue to be enthusiastic about face transplantation despite these issues, the uncertainty surrounding the procedure's long-term outcomes, and the fact that it is still mostly regarded experimental [4].

Intact face structures are necessary for the senses of smell and vision. Although FT cannot bring back lost vision, it can normalize smell through nasal channel restoration. Speech and facial expression are necessary for communicating. The fundamental language of emotion expression that is widely accepted involves 26 facial muscles. Each of these muscles has a role that is difficult to replicate with traditional reconstructive methods, but FT allows for the restoration of anatomical counterparts. For an intelligible articulation, breech and vowel sounds require labial competence and an oral cavity, which cannot be recovered by traditional restoration in the most severe injuries [5, 6].

To survive, one must breathe and consume food. Patients with serious facial injuries may struggle to consume solid foods, liquids, or even their prescriptions due to oral cavity leaks, trismus, and lack of masseter muscles. This finally results in the placement of a gastrostomy or feeding tubes, which can be extremely uncomfortable and increase the risk of infection, hemorrhage, malnourishment, and even death. Impairments to the upper respiratory tract are far more dangerous to health. When a patient's mouth opening is insufficient, their nasal channel is blocked, their naso- and velopharyngeal spaces are restricted, or they are seriously deformed, making tracheostomy inevitable. Dysphagia and fistula development are two problems related with tracheostomy that have a significant risk of death. In a single step, FT restores the upper airway, the oral cavity, and masticatory function. Decannulation and oral food intake are viable postoperatively, which can result in considerable improvements in quality of life and the avoidance of potentially fatal complications [7, 8].

Figure 1. EPISODE OF ACUTE REJECTION

Figure 2. THE RECIPIENT'S FACE AND CORRESPONDING FACIAL STRUCTURES ARE DISSECTED SIMULTANEOUSLY WHILE THE DONOR'S GRAFT IS REMOVED.

DISCUSSION

The human face performs essential duties for day-to-day living and to avert potentially fatal situations. The sense of smell is vital for identifying scents and has a role in flavor perception. Numerous studies have demonstrated that a diminished sense of smell suppresses appetite, which can result in changes in body weight or even malnutrition. When comparing patients with hyposmia to healthy volunteers, quality of life evaluations revealed slightly different findings [1-3].

Reduced airway volume, increased airway resistance, and ultimately reliance on a tracheostomy tube for breathing are the outcomes of anatomic deficiencies in the upper airway. Fischer et al. (Boston, MA, USA, submitted April 2014) examined the impact of FT on airway recovery in one of our most recent investigations. In addition to experiencing subjective improvement and unrestricted nasal breathing, all patients who were reliant on tracheostomy tubes had their tubes removed following FT. Tracheostomy tubes can lead to a number of issues, including blockage, persistent aspiration, dysphagia, pulmonary infections, fistula development, and bleeding ulcerations. These complications can all have severe or even fatal effects. Decantulation following FT thereby enhances quality of life and guards against possibly fatal sequelae. Independency from an artificial airway might be one of the most valuable aspects of FT [3].

Following FT, every patient was able to talk clearly again and use their faces to convey their feelings. This illustrates how

FT promotes social integration for those who were previously deformed as well as communication amongst people. It also makes these people more beautiful [9].

However, there is no denying that FT is a high-risk technique, and that both the surgical process and the necessary immunosuppression have a danger of fatal consequences [10].

Twenty FT recipients who were reported at the time of Chopra et al.'s study were given a score. The majority of the data was either absent or taken from the general public rather than peer-reviewed publications, despite the fact that the results supported FT as an effective method for face reconstruction. Moreover, social stability and performance ratings, comorbidities, and surgical history were all included in the scoring system, which was first used to identify candidates for FT. These are factors that are not immediately related to face function and need time to assess in retrospect [11].

Surgical approach

Both the donor's and the recipient's operations begin simultaneously. The recipient patient should have their veins and nerves exposed initially, followed by the excision of scar tissue—that is, non-functioning tissues—during the process. Because of the bleeding, this period can be especially challenging in cases of neurofibromatosis. More than anyplace else, improvisation puts the patient at risk of severe bleeding and perhaps death. The external carotid artery and venous trunks are examples of recipient vessels. The facial nerve trunks and trigeminal nerve branches are examples of recipient nerves. When it comes to burn patients or individuals who have had several surgeries, this stage might be challenging. A chilled box is used to transport the transplant. Arterial anastomosis is performed after flushing. Subsequently, contralateral anastomoses are made after venous anastomosis. The graft must subsequently be modified to account for the recipient patients' loss of content. Due to the frequent incongruity, this phase might be challenging in cases where bone structures have been lost. Osteosynthesis is the process of joining bone components with miniplates and titanium screws. The primary challenge is that when this osteosynthesis is completed, some structures—like the palatine veil or specific nerves—that need to be sutured will no longer be accessible. A series of wires positioned beforehand that will be dropped at a distance using the slipknot concept solves the problem. Lastly, skin and mucosal stitches are applied [12].

CONCLUSION

A face transplant has never been performed in our country. Regardless of how far forward FT has progressed in recent years, a consistent outcome evaluation is necessary to expand the application space, get past the experimental stage, and establish FT as the primary reconstructive choice for patients with severely deformed faces.

FT may be beneficial in improving quality of life and may even be able to avert potentially fatal consequences. To overcome the experimental nature of FT and strengthen evidence, future outcome reports should include information on problems and the capacity to smell, breathe, eat, speak, grimace, and feel facial sensations before and after FT. Unfortunately, many data are lacking from these reports.

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