Commentary

A Second Chance at Life

ALEXANDRE G. LELLOUCH and LAURENT A. LANTIERI

History

Vascularized Composite Allotransplantation (VCA) including Facial Transplantation (FT) emerged as a unique solution for anatomically restoring faces after disfigurement. It became a clinical reality after the first successful face transplantation in 2005.[1] VCA is a rapidly growing new field in plastic surgery; and from November 2005 to the time of this writing in September 2018, 44 transplants have been performed worldwide. It is clear that many more transplantations will be performed in the future. The main concern in VCA remains the risk of chronic rejection[2] and graft loss[3] despite life-long immunosuppression. Scientists are actively working on new strategies to reduce the burden of immunosuppression and prevent immune rejection. The most promising approach is the development of tolerance protocols through the induction of mixed chimerism[4]. Indeed, it is the sole strategy to have demonstrated long-term tolerance in solid organ transplantation in humans.[5] Currently, the gold standard in reconstructive surgery remains the use of autologous tissue. This strategy is still very useful to replace limited missing body parts (like mandible) by tissue transfer (for example, osteomyocutaneous flap). However, the functional sensory organs (mouth, eyes) cannot be restored adequately by these conventional surgical techniques.

The goal of face transplantation is not only to restore the patient's appearance but also, to create a new physiognomy that will allow the facially disfigured person to adapt and reintegrate into life. Before the advent of VCA, the complexity of the face made surgeons unable to reestablish an "acceptable outcome," leaving disfigured patients little chance of social rehabilitation. Nowadays VCA surgery, while offering new hope, represents an important challenge (even for the top facility) for the surgical[6] and medical[7] team. First, there must be a high level of cooperation between the various specialists including surgeons, anesthesiologists and nephrologists. Secondly, the management of immune rejection remains a primary on-going concern due to the untreatable chronic rejection effect.[8]

Background

Over the last 20 years, our surgical team has been led by Laurent Lantieri. Numerous articles have been written on the ethical issues[9,10,11] pertaining to FT. In our hospital, European George Pompidou in Paris, the anatomical study on face transplantation was performed in 2005[12]. In 2007, we performed our first partial face transplant case[13] (the third in the world); the first successful partial face transplant was performed in 2005 in Amiens, France.[14] We determined that in the light of immunosuppressive regimen improvement, it appeared reasonable to consider VCA as a clinical option, especially for hand and face transplantation.[15]

The scientific community continues to debate the ethical dilemmas regarding FT[16]. Our team already transplanted a patient after shotgun injury.[17] Following the

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success of our first face transplant, we decided to go further with the elaboration of the first full face transplant.[18] Our first report evaluating the short-term quality of life was encouraging.[19] Regarding types of disfigurements, the most frequent situations involve the severely disfiguring facial tumors of neurofibromatosis, shotgun injury, dog bites, and burns; but in our experience, burn patients are not considered the best candidates for receiving VCA due to the risk of sensitization after care management.[20] Furthermore, there is no benefit to changing the standardized care management of burn patients (using skin allograft, blood transfusion) due to the high risk of medical complications.[21] In our series of VCA/FT patients with more than five years follow-up, we demonstrated positive outcomes.[22] In addition to improvements in immunosuppressive strategies, we described our protocol for management of the facial nerve (one anastomosis at the trunk). The aim was to simplify and improve surgical outcomes in FT by avoiding dyskinesia.[23] Unfortunately, one of our FT patients rejected his face leading to a total graft loss within a few months. We published a letter to the editor in the journal *Lancet* addressing the risk of face retransplantation.[24] Under extremely urgent conditions we pushed forward in retransplanting the patient.[25]

Comment

In their paper, McQuinn et al. raise the challenge of human FT post Self-Inflicted Gunshot Wound (SIGW). The major ethical concern is the potential risk of recurrence of such a suicide attempt. According to the manuscript, 25% of the FTs performed have been in patients identified as survivors of SIGWs, and one recipient has committed suicide post-transplant.[26] This clinical reality has already been accepted by most VCA surgeons. Interestingly, ballistic trauma patients have eclipsed burn patients who were initially projected to make up the largest number of transplants. This confirms the observation that we made in 2004[27] that ballistic trauma patients can be excellent candidates for FT. Beyond the risk of suicide, patients' intellectual ability and their understanding of long-term treatment is the minimal requisite for suggesting this surgery, and more determinative than the type of injury itself.

In transplants, as in the rest of modern healthcare, the debate also involves the cost for society. In our institution, the transplantation of a face led to higher costs than heart or any other solid organ, and represented twice the costs for a liver transplantation.[28] The question is: how much is society willing to expend resources to help these people? In the case of face transplant (contrary to solid transplantation indications), there are no face shortages so far.

A close follow-up post-face transplant is crucial for detecting the first signs of psychological distress. As reported by the authors, mortality from SIGWs can be as high as 80%. The survivors have important morbidities and lifelong disabilities. A global assessment of the possibilities of motor and sensitive function restoration will help address the risk-benefit ratio in FT. A patient with SIGW suffers significant psychological pain that must be treated. The decision to perform a VCA is multidisciplinary, depending of the psychological state, the surgical feasibility, and the willingness of the patient. We understand and appreciate the importance of the role of psychiatrists and psychologists for identifying "low-risk patients." These professionals need to make the distinction between known psychosocial

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contraindications (active psychoses, amongst them) and SIGW. Our institution does not exclude patients with SIGW, viewing VCA as a chance to give the patient a "second chance" at life.

The patient's ability to make medical decisions for themselves cannot be overestimated. A prerequisite for the surgery is fully informed consent to all aspects of the procedure, which becomes a more complex issue as VCA for children is explored,[29] along with understanding and committing to the extensive after-care regimen. This point is particularly important since an inability to adhere to the post-transplant regimen can lead to adverse outcomes, including rejection and graft failure. But even with treatment compliance, we cannot rule out the risk of developing chronic rejection.

The authors stated that the general public in the United States supports solid organ donation but is hesitant about vascularized composite allotransplantation. But looking back at the first heart transplant, when the world was amazed by Christian Barnard's case, support was also not immediate for taking a heart that had only arrested during surgery with cardioplegia. This reluctance may be traced to insufficient communication, and lack of information from the VCA center. Inadequate clarification can lead to confusion and misunderstanding, causing relatives of donors to have misconceptions regarding the procedure, and refusing to donate for VCA. Disfigurement of their diseased loved one is often a major concern. As surgeons, it is imperative that we restore the donor's face to its original structure. The general public remains unaware of this part of the procedure, as does much of the medical community. This is necessary, to show respect to the donor's family, and also the donor.

The ethics of face transplantation go far beyond recipient risk-benefit analysis, and allocation of resources. It involves all the questions regarding the use of body parts after death raised in the literature by Mary Shelley's novel, *Frankenstein*, written a century ago. For example, are we an amalgamation of organs? If so, is a part of personality is transferred when organs are transferred—even more so when it is related to the face? But a human being is a complex system, and a complex system is not the addition of simple elements. In VCA, we are not transplanting personality through a face transplant, but restoring faces to rehabilitate patients and bring them back to a normal life.

Conclusion

FT goes beyond the restoration of the anatomical subject; it is the retrieval of the self-esteem. The right to have a face goes beyond improving the quality of life; it is at the core of human dignity. The atrocities performed on concentration camp prisoners in World War II, under the guise of "scientific experiments," demonstrated the ravages of a loss of dignity. We agree with the conclusion of the authors regarding the absence of justification for rejecting patients with SIGW. The allocation of health care resources is very important, but the decision to provide VCA lies at the health policy decision level; physicians have the professional duty to provide their patients with the best treatment options available. VCA is the best treatment option available for SIGW, and needs to be considered in the therapeutic arsenal for treating it. The report of long-term follow-up will bring new insight to this topic.

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