Many years ago, in my days as a resident in plastic surgery at Stanford University in California, Dr. Norman Shumway at that same university was pioneering the field of cardiac allotransplantation. One day, while seeing patients, I saw a young man whose left hand had been amputated. He consulted me with a request for a hand transplant. I counseled him that, at that time, although technically feasible, hand transplantation was not possible because the hand would reject. (In those early days, even cardiac transplantation was still just a research project in Shumway’s laboratories). Upon this confrontation with reality, the patient’s interesting response was: “Don’t worry doctor, if you go ahead with it, God will make it good.”

The past 2 years have seen the dawning of a new era of reconstructive surgery. This past May, I attended a remarkable conference in Louisville, Kentucky. Teams from Louisville, France, and China presented four human hand transplant cases, which at the time of the meeting had passed the 1-year post-transplant follow-up. The results presented were beyond all expectations. Both the Louisville and the Chinese patients demonstrated good function in the short follow-up period since the surgery. I was allowed to personally examine the Louisville patient and was impressed with the lack of visible rejection, the reasonably good tendon function, and the early return of sensibility that I observed.

Upon hearing of the early reports of hand transplantations, my initial reaction was that the time was not ripe for this feat. The strong anti-rejection medication required to sustain these transplants was, in my opinion, unwarranted. However, after seeing the results presented at the conference and having examined the Louisville patient myself, I have since changed my mind.

I now recognize that it was important to perform these transplants, especially under the strict research guidelines demonstrated by the Louisville group. Under these guidelines, the patient is well informed of the risks and dangers of the medications as well as the possibility of losing his transplant. Under these controlled circumstances and with the expertise both in hand surgery and medical transplantation, I believe that the patients, physicians, and public have been well served. Both the clinical and medical experience gained from performing these first transplants is of un estimable value. Once this novel procedure is no longer under a research protocol, this experience will serve as a valuable platform from which others among us will be able to offer this procedure at multiple institutions worldwide.

The symposium in Louisville and its testimonies of the world’s best in transplantation have led me to believe that this time will soon be upon us. Two experimental protocols were presented at the meeting that would abolish the need for anti-rejection medication making the patient “tolerant” to the transplanted organ/tissue. If successful in humans, these tolerance protocols would allow transplantation without immunosuppression and the preservation of the patient’s immune system to protect against harmful antigens. When techniques like these enter the clinical arena, procedures like hand transplantation will immediately become common practice in reconstructive surgery. Then the time will have come when our young residents can tell their patients: “Yes, with a little tolerance, and the help of God, we can reconstruct your arm with a transplanted hand!”

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INTRODUCTION

As organizers of the Second International Symposium on Composite Tissue Allotransplantation, it is with great pleasure that we compile and edit the proceedings of this unique and exciting symposium for the readers of Microsurgery. In addition to chronicling the highlights of this meeting, the 17 articles in this special issue were especially selected and edited to provide reconstructive surgeons with a broad overview of where the field of composite tissue allotransplantation (CTA) came from, where it is today, and where it is headed in the future.

A recent survey (1) revealed that more than 7 million Americans require tissue (skin, muscle, nerve, bone, cartilage, tendon, or ligaments) for these types of reconstruction each year. This figure is more than double the number of solid organs (heart, liver, pancreas, and kidney) needed annually. Despite this great need, CTA has not enjoyed the same widespread clinical acceptance as solid organ transplantation. One of the main reasons for this can be explained by a risk-versus-benefit equation.

Because organ transplants are often life-saving procedures, the risks posed by the toxic immunosuppressive drugs required to prevent organ rejection are considered to justify the benefits. In the case of non–life-saving transplants like CTAs (such as hand, larynx, bone, facial, tendon, nerve), this equation is not as clear. Indeed, many argue that the risks posed by immunosuppressive drug therapy do not justify the benefits of using CTAs for reconstructing large tissue defects.

In September 1991, a conference on the clinical use of CTA was held in conjunction with the Rehabilitation Research & Development Service of the Department of Veterans Affairs in Washington, DC. The purpose of the conference was to determine “the clinical feasibility of transplanting limbs in patients with limb loss” and “the direction in which clinically oriented limb transplantation research should head.” The conference participants concluded that composite tissue allotransplantation would be clinically possible in the near future and that “historic” initial trials would occur within the next 2 to 5 years.

Six years later (November 1997), although initial clinical trials had not yet materialized, a meeting (1st International Symposium on Composite Tissue Allotransplantation) was convened in Louisville, Kentucky, to discuss “the scientific, clinical, and ethical barriers standing in the way of performing the first human hand transplant”. At the meeting, international experts from a variety of different disciplines concluded that the time had come to perform the first clinical hand transplant. This was highlighted in the closing remarks of the meeting proceedings (Transplantation Proceedings 1997;30:2686–2787) that ended by stating the time had come to “just do it.” Within the next 22 months, the first four successful human hand transplants had been performed by three teams in Lyon, France, (September 23, 1998), Louisville, Kentucky (January 23, 1999), and Guangzhou, China (two separate transplants on September 21, 1999). On May 17–18, 2000, the 2nd International Symposium on Composite Tissue Allotransplantation was held in Louisville, Kentucky. The purpose of this second meeting in Louisville was to evaluate the status of the CTA procedures that had been performed to date and to share the successes and failures experienced by the different teams. At this meeting, the clinical outcomes of not only hand but also bone, nerve, tendon, and larynx allotransplants were presented. The overall consensus of the meeting was cautiously optimistic. At the time of the meeting, the early results of all the CTAs presented were encouraging and without a doubt warranted further clinical trials.

Before performing the first human hand transplant, reconstructive surgeons had perfected their surgical techniques during many years replanting amputated hands. At the same time, transplant surgeons had perfected all aspects of donor tissue procurement, patient selection/preparation, and immunosuppressive drug therapy during years of clinical solid organ transplantation. The combination of this vast knowledge and experience has created a new field of medicine. As we shape this new field, we have both the opportunity and the responsibility to do so in such a way that will bring maximum benefit to our patients and, most important, do no harm. We hope that this series of articles will serve to dispel past misconceptions about CTA and in doing so help move this valuable new treatment option into the mainstream of reconstructive surgery in a thoughtful and responsible way.

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REFERENCE