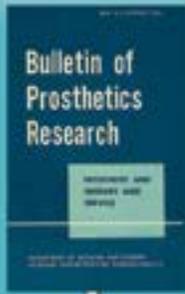
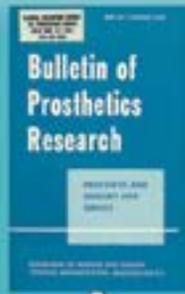


1964



1966



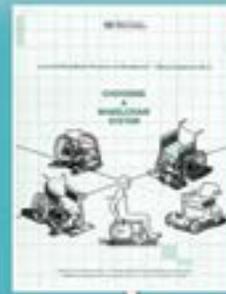
1967



1972



1985



1990



1994

THEN & NOW

2001

2003

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2009

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REPORTED FROM ABROAD*

LIMB TRANSPLANTATION: A SKEPTIC'S VIEW

Dr. Rolf Dederich, Director of the Orthopaedic Department of the St. Petrus Hospital in Bonn, expressed skepticism over press reports of successful reattachment of severed limbs in an article that appeared in *Orthopädie Technik*, January 1963. He stated that there was not the slightest reason to believe that transplantation of extremities from cadavers to amputees could succeed. Although Dr. Dederich acknowledged the possibility of reattaching a severed limb, he asserted that under no circumstances could previous function be restored. He also pointed out that since even skin homografts between parents and children and between siblings (nontwin) were rejected, there was little likelihood of a whole part, such as a finger, not incurring far greater difficulties. In Dr. Dederich's opinion, press reports of reattached limbs succeeded only in arousing false hopes in too many amputees throughout the world.

*Based chiefly on translations by Dr. Gabriel Rosenkranz, Medical Consultant to the VA Prosthetics Center.

<http://www.rehab.research.va.gov/jour/64/1/2/177.pdf>

LIMB TRANSPLANTATION: FROM A CONCEPT TO REALITY OVER THE LAST 50 YEARS

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In any scientific or clinical endeavor, we proceed with our best “guess” for our patients and hope for the best. A key part of this process is our colleagues, who objectively review the progress and define challenges that must be overcome. That was true 50 years ago and it is true today. That being said, I was pleased to review the 1964 article “Limb transplantation: A skeptic’s view” and reflect on the fact that in this case, the best guess turned out to be a good one.

In his comments, Dr. Dederich questioned whether amputated limbs could be successfully reattached. He went on to state that there was “not the slightest reason” to think transplantation of limbs from a cadaver could work and, in the case of reattachment, even if the limb survived, “under no circumstances could previous function be restored.” His concern was that such theories would arouse false hope in people with amputations.

At the time of the article, techniques of microsurgical repair were being developed around the world. Kleinert et al. performed the first digital artery anastomosis in a partially amputated thumb in 1963 [1]. Malt et al. attached the arm of a 12-year-old boy in 1962 [2]. Komatsu and Tamai reported on their experience attaching a completely severed digit in 1968 [3]. The field of replantation of severed arms and limbs continued to develop into standard of care practice, with more than 80 percent suc-

cess levels achieved within 20 years of Dr. Dederich’s comments.

In 1964, the first hand transplant was successfully attached in Ecuador [4], but the graft was quickly lost because of inadequate immunosuppression. The first successful hand transplants occurred within a few months of each other in 1998 and 1999 in Lyon, France [5] and Louisville, Kentucky [6]. Our first patient, Matt Scott, is more than 14 years posttransplant and doing very well. He has good intrinsic function and uses the hand in all types of activities of daily living. This addresses another of Dr. Dederich’s concerns, that good function would not be achieved in either replants or transplants. Mr. Scott has proven him wrong. In the last 14 years, the field of vascularized allotransplantation has become a reality, which we were privileged to publish in the *Journal of Rehabilitation Research and Development* in 2009 [7]. The field is growing steadily, but carefully, with more than 70 hand transplants performed to date (www.handregistry.com).

Challenges certainly remain. The requirement for systemic immunosuppression restricts this treatment from many who might benefit. However, novel strategies using stem cells from bone marrow and adipose tissue may allow us to greatly reduce the need for these drugs. These advances will allow us to offer transplantation to more than the select few and even to children. We are motivated to restore the best possible quality of life to those who have lost limbs in the service of our country.

Healthy skepticism is good for any project. If Dr. Dederich had the opportunity to shake the hand of one of our replant or transplant recipients, I am sure he would be pleased.

REFERENCES

1. Kleinert HE, Kasdan M, Romero JL. Small blood-vessel anastomosis for salvage of severely injured upper extremity. *J Bone Joint Surg Am.* 1963;45(4):788–96.
2. Malt RA, McKhann C. Replantation of several arms. *JAMA.* 1964;189:716–22. [[PMID:14175645](https://pubmed.ncbi.nlm.nih.gov/14175645/)]
3. Komatsu S, Tamai S. Successful replantation of a completely cut-off thumb. *Plast Reconstruct Surg.* 1968;42(4):374–77.
4. Gilbert R. Hand transplanted from cadaver is reamputated. *Med Trib Med News.* 1964;5:23.
5. Dubernard JM, Owen E, Lefrancois N, Petruzzo P, Martin X, Dawahra M, Julien D, Kanitakis J, Frances C, Preville X, Gebuhrer L, Hakim N, Lanzetta M, Kapila H, Herzberg G, Revillard JP. First human hand transplantation. Case report. *Transpl Int.* 2000;13 Suppl 1:S521–24. [[PMID:11112064](https://pubmed.ncbi.nlm.nih.gov/11112064/)]
6. Jones JW, Gruber SA, Barker JH, Breidenbach WC. Successful hand transplantation. One-year follow-up. Louisville Hand Transplant Team. *N Engl J Med.* 2000;343(7):468–73. [[PMID:10950668](https://pubmed.ncbi.nlm.nih.gov/10950668/)]
7. Kaufman CL, Blair BW, Murphy EE, Breidenbach WC. A new option for amputees: transplantation of the hand. *J Rehabil Res Dev.* 2009;46(3):395–404. [[PMID:19675991](https://pubmed.ncbi.nlm.nih.gov/19675991/)]

