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Contents

Foreword	1
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William W. Shaw

Microvascular Free Flaps: The First Decade	3
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William W. Shaw

After a decade of microvascular free flap surgery, it is obvious that the procedure is here to stay and will become an increasingly important part of reconstructive plastic surgery. Among experienced plastic surgeons, the overall success rate is currently 95 per cent. This article reviews the major conceptual advances, the various donor sites and their specific uses, and the results to date.

Methods of Assessing the Viability of Free Flap Transfer During the Postoperative Period.....	21
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Douglas H. Harrison, Marjorie Girling, and Godfrey Mott

During the last five years, the authors examined various methods of monitoring the circulation through free flap transfers. Some methods proved to be unreliable, but they found modified plethysmography to be the most consistently reliable. The laser Doppler is a fascinating new tool that provides a response to a known factor, movement of red cells within a capillary bed. Further development is needed for the Doppler to provide more information related to the flow of blood into the flap, possibly to measure absolute volume per unit time.

Microvascular Free Flaps for Skin Coverage: Indications and Selection of Donor Sites.....	37
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Kiyonori Harii

The use of muscular and musculocutaneous flaps, as encouraged by many plastic surgeons in America, quickly became popular, owing to their technical simplicity and wide application. Development in utilization of the vascular anatomy of skeletal muscles has innovated this concept even further. The long stalk and large caliber of pedicle vessels in the musculocutaneous flaps enable easy and reliable anastomosis. Another use of the free flap is in varying a vascularized bone graft together with a skin flap.

Reconstruction of the Lower Extremity: Microsurgical Composite Tissue Transplantation.....	55
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Donald Serafin and Vincent E. Voci

Reconstructive surgery of the lower extremity has been revolutionized in the last decade with the introduction of new donor tissue

made possible by microsurgery. In these procedures, a large segment of muscle or cutaneous tissue on a muscle, island vascular pedicle, or neurovascular pedicle is transferred. In the hands of experienced surgeons, the length of the operation has not been excessive.

Microvascular Flap Reconstruction of the Head and Neck: An Overview..... 73

Stephen R. Colen, Daniel C. Baker, and William W. Shaw

The ability to transfer tissues by microvascular techniques has opened up new possibilities for reconstruction of the scalp, face, mandible, esophagus, intraoral lining, and neck. With advances in microsurgical techniques and the choice of donor flaps, the success rates of microvascular flaps in the head and neck compare favorably with that of regional flaps.

Replantation of the Upper Extremity..... 85

*Christopher S. Wilson, Bernard S. Alpert,
Harry J. Buncke, and Leonard Gordon*

In recent years the functional results after replantation of the upper extremity, including hands and digits, have improved with our increased experience. The groin, scapular, deltoid, and dorsalis pedis flaps are the mainstays of free flap transplantation to the upper extremity. Stiffness remains the single greatest postoperative problem, but improvements in this area are now possible with closely supervised hand therapy and splinting.

Replantation of the Lower Extremity..... 103

Zhong-Wei Chen and Bing-Fang Zeng

Traumatic amputation of the lower extremity is not uncommon when compared with that of the upper extremity. However, fewer cases of lower extremity replantation have been reported. One of the possible reasons for this is that few severed lower limbs were feasible for replantation because of severe trauma. The authors present their results of 36 lower extremity replantations.

Replantation of Amputated Parts of the Penis, Nose, Ear, and Scalp 115

*Berish Strauch, Leonard A. Sharzer,
Jane Petro, and Bruce Greenstein*

The primary restoration of traumatically amputated penis, nose, ear, and scalp is now routinely possible through the use of microvascular and microneural surgery. The predictable survival of tissues and the return of neural function, especially the sensory mode, suggest that replantation of these parts would result in a greater survival rate, more esthetic results, and better function.

Salvage Replantation 125

*Stephen R. Colen, Mauro C. Romita,
Norman V. Godfrey, and William W. Shaw*

The immediate concern of surgeons in the past who treated traumatic limb amputations or severe crushing injury was to decide upon the level of amputation. Recently the focus has shifted to that of deciding

whether replantation of the amputated limb is indicated or not. The authors report the salvage of four patients. In each case the ultimate reconstructive goals were planned during the initial operative procedure, allowing them to use parts that had been amputated and would otherwise have been discarded.

Microlymphatic Surgery for Lymphedema 133

Charles L. Puckett

Why certain tissues develop lymphedema and others do not is an enigma. Some progress has been made in understanding the disease, and treatment has improved but is palliative at best. This article discusses primarily the role of lymphovenous microanastomoses in treating lymphedema.

Microvascular Reconstruction of the Hand 139

Sumner A. Slavin

The advent of microsurgical techniques has revolutionized reconstructive vascular surgery of the hand. Conditions previously considered untreatable or difficult to treat—such as chronic digital ischemia, palmar aneurysms, major arterial thromboses, digital occlusions, and Raynaud's disease—can now be repaired under the operating room microscope. This article reviews the more common vascular problems of the hand in terms of recent advances in both diagnostic evaluation and microsurgical management.

Microsurgery and the Community-Based Plastic Surgeon 145

David W. Furnas

To determine the role played by the use of microscopes and loupes in the day-to-day community practice of plastic and reconstructive surgery, the author sent questionnaires to plastic surgeons who completed their residency programs at the University of California, Irvine, during the period from 1970 to 1980. It was found that microsurgical training was clearly useful in affording the surgeons the best techniques for repair of nerve and vessel injuries and for introducing them to more complex procedures. The results may be useful in formulating a microsurgery program in the community hospital.

Free Flaps in Young and Old Patients 149

*David W. Furnas, Ivan M. Turpin, and
Joseph M. Bernstein*

Free flaps are not common at the extremes of age because vessels are small in children and are afflicted with degenerative changes in the elderly. The authors of this article performed an iliac osteocutaneous free flap transfer in a 9-year-old girl with hemifacial microsomia and a radial artery free flap in a 91-year-old man with a skull defect from malignant histiocytoma.

Reproductive and Urogenital Microsurgery 155

Thomas F. Crais, Jr.

A new interspecialty has evolved, based on the knowledge of reproductive endocrinology, the awareness of gynecologic and uro-

Contents

logic pathologies, and the techniques of microsurgery. This article discusses the applications of microsurgery to such procedures as vaginal or tubal reconstruction, ureterotomy, vasoepididymostomy, vasovasostomy, testicular transplantation, and penile reconstruction.

Microsurgical Correction of Vasculogenic Impotence 173

William W. Shaw and Adrian Zorngiotti

There is no doubt that many patients with vasculogenic impotence can benefit from microsurgical revascularization and regained potency. The simplicity and low morbidity of current microsurgical bypass procedures already make such procedures easily justifiable.

The Current Status of Free Vascularized Bone Grafts 185

G. Ian Taylor

Free vascularized bone transfer has special application for those situations in which the bone defect is large, the recipient bed is poorly vascularized, and there is an associated soft tissue deficiency. Donor sites now include the fibula, iliac crest, rib, metatarsal, radius, and scapula. The author uses ten case studies to illustrate the application of these grafts.

Preservation of Tissues for Transplantation and Replantation 211

R. Razaboni and William W. Shaw

The success of transplantation and replantation in recent years clearly establishes the fact that most tissues or organs in the body can tolerate a period of ischemia and survive after reestablishment of circulation. Extending this tolerable period of ischemia would be immediately useful in extending the scope of feasible clinical microvascular surgery. Experimental data and clinical experience with hypothermic preservation indicate that this tolerable warm ischemia time can be extended several-fold simply by cooling.

Index 217

Subscription information Inside back cover