

EVALUATION AND TREATMENT OF UPPER AND LOWER EXTREMITY CIRCULATORY DISORDERS

Edited by
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and
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Grune & Stratton, Inc.

(Harcourt Brace Jovanovich, Publishers)

Orlando	San Diego	San Francisco	New York		
London	Toronto	Montreal	Sydney	Tokyo	São Paulo

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Grune & Stratton, Inc.
Orlando, FL 32887

Distributed in the United Kingdom by
Grune & Stratton, Ltd.
24/28 Oval Road, London NW 1

Library of Congress Catalog Number 83-49101
International Standard Book Number 0-8089-1630-0
Printed in the United States of America

84 85 86 87 10 9 8 7 6 5 4 3 2

Foreword

This book is the product of an annual event, the symposium on vascular surgery at Northwestern University, organized and directed by the editors, Drs. John Bergan and James Yao. They ask the participants to submit manuscripts in advance of the symposium and, with remarkable efficiency, work with the publisher to make the book available at the symposium. Few books have such short gestation times. The result is an up-to-date volume that provides the reader with the most recent thoughts and techniques of the authors.

The contributors are experts. They take care of patients, in addition to teaching and investigating, so that their chapters have a practical orientation. The splendid piece by Harris B. Shumacker, whose brilliant surgical career is taking an equally impressive literary turn, is a special treat.

The body of knowledge that comprises vascular surgery is increasing in breadth as well as depth, a trend reflected in the subject matter covered in this book. Evaluation and treatment of circulatory disorders of the extremities now requires an understanding of nutrition and platelet function, as well as the roles of a variety of angiographic and noninvasive techniques in the assessment of patients. The newer nonsurgical treatments, including balloon dilatation and thrombolytic therapy, are under intense scrutiny by surgeons; their potential usefulness is obvious, and the specific indications and contraindications are less hazy, but not yet crystal clear. Our understanding of those less common circulatory disorders that are not caused by atherosclerosis is much more complete, and although our knowledge of these diseases is replete with uncertainty, we do know how to help these unfortunate patients, who often are young and anxious to be productive.

The people who wrote this book, and Drs. Bergan and Yao, who brought them together, have served us well. We now have a treatise on circulatory disorders of the extremities, written by experts in the field, which is both comprehensive and up-to-date.

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Introduction

Human endeavor is marked by change; so is the treatment of circulatory disorders of the extremities. In 1956, Peter Martin's authoritative textbook on vascular disorders covered the treatment of gangrene in five pages, two of which were filled with photographs. No mention was made of revascularization prior to amputation or debridement. So, within the scope of a surgical practice lifetime, the educated surgeon has come to prefer revascularization and rehabilitation, and considers amputation to be suitable for only a small percentage of the patient population.

This volume represents an attempt to place within two covers the newest thinking about treatment of circulatory disorders. The subjects are discussed by authors who have made original contributions in the area of their exposition.

Harris Shumacker, now at the Uniformed Services University of the Health Sciences in Bethesda, made early contributions on the treatment of causalgia and frostbite and investigated basic principles of arterial wound healing. No one is more qualified than he to present a fact-filled summary of the beginnings of vascular surgery, which makes interesting reading as well.

There have been many studies on the interactions of constituents of vessel walls. In this volume, the interactions of vascular smooth muscle cells and endothelial cells are discussed by Alexander Clowes of Seattle.

Change also occurs in the methods of evaluation of circulatory disorders. New techniques, such as digital subtraction angiography, so eloquently detailed by Jerry Goldstone of Tucson, have become a regular part of vascular practice, and no longer appear to be futuristic in concept. Noninvasive assessment has become routine in vascular surgical practice. The application of noninvasive techniques in evaluation of the lower extremity was pioneered by D. Eugene Strandness of Seattle, who supplied the chapter on this subject, while his former coworker, David Sumner of Springfield, provided information on noninvasive assessment of the upper extremity.

Noninvasive and invasive methods of assessment of circulatory disorders of the extremities have invaded the operating room. The Northwestern University group pioneered pre-bypass operative arteriography, and their experience is summarized in a chapter by Terry King, now of Washington, D.C. D. Preston Flanigan of the University of Illinois in Chicago has become authoritative on the techniques of peri- and intraoperative assessment in limb revascularization, and covers the subject in this volume.

Vascular surgeons are learning lessons from their general surgical colleagues, and have found nutritional supportive measures to be important in dealing with complicated problems of vascular reconstruction and infection. Jonathan Meakins of Montreal has long been an authority in this field, and summarizes his thoughts on the vascular patient in his contribution.

Sympathectomy and its effect played a large part in the text of Peter Martin's 1956 volume. Since that time, the operation as applied to the upper and lower extremities has undergone a decline. The procedure nevertheless remains useful. James May and John Harris of Sydney, Australia have had much experience, and have compared various approaches to sympathectomy of the upper extremity. While Leriche advocated peri-arterial sympathectomy, and the operation was practiced by surgeons as late as the Korean War, this operation had become obsolete until resurrected by microsurgeons operating principally on the hand. E. F. Shaw Wilgis of Baltimore has been a careful observer of this operation, and has measured the results in his patients. His presentation in this volume represents the latest thinking on this operation.

Blagoja Janevski of Maastricht, The Netherlands, has provided the most authoritative book on arteriography of the upper extremity. His chapter on angiography of the upper extremity is a comprehensive distillate of his book.

Digital embolization from proximal atherosclerosis, aneurysms, and cervical rib has been recognized for many years, but the treatment of this entity has changed, and this is summarized by Larry Hollier of the Mayo Clinic. Particular vascular complications due to the thoracic outlet are more thoroughly discussed by Edouard Kieffer of Paris, who has accumulated great experience with this entity.

Direct revascularization of the upper extremity has become routine. In this volume, distal reconstructions for hand ischemia are presented by Walter Whitehouse of Ann Arbor, who draws many of his conclusions from his experience at the University of Michigan.

Vascular access is an important part of the training and experience of vascular surgeons today. There was no such thing available in 1956, when Peter Martin discussed renal failure in his textbook. Charles Anderson of St. Louis has accumulated a great deal of experience, and has observed the changing methods for primary and secondary operations. His contribution can be considered to be a definitive one.

Revascularization of the severely ischemic lower extremity remains a challenge for vascular surgeons. Here, innovation remains the watchword. Various techniques, no one of which can be considered the final answer, are available. For example, the short vein bypass has proven itself in the hands of Frank Veith of New York, who contributed a chapter on this subject. The composite sequential graft, incorporating the principles of the short vein bypass, has been a particular interest of William Flinn, who has summarized the experience of the Northwestern vascular group. Wise judgment is required in selecting between autogenous vein and prosthetic grafts for femoro-tibial occlusive disease. No better authority than John Mannick of Boston could have been selected for the chapter on this subject. The isolated popliteal segment remains an enigma, but David Brewster of Boston provides insight into this operation. The obturator bypass, formerly used only for treatment of groin infection, has been extended to a variety of situations. William Pearce, now of Cincinnati, has contributed a chapter on this subject, and brings to it the thinking of the vascular group at Northwestern University. The thoracic aorta may be used in tertiary aortic reconstructions after successful treatment of aortic infection. John Ochsner of New Orleans, who combines the talents of cardiac and vascular surgery, has contributed the chapter on this subject.

Current investigations may point the way to future treatments. It is therefore necessary to understand the possibilities afforded by endothelial cell seeding of prosthetic grafts, which are discussed here by Linda Graham and James Stanley of the University of Michigan. The cells involved change in different milieu. These changes are enumerated in detail in the contribution of Vikrom Sotturai and Robert Batson of New Orleans. The reaction of these cells to platelets and antiplatelet therapy has been of interest to modern vascular surgeons, and James DeWeese of Rochester has been at the forefront of these investigations. His thoughts are summarized here.

The two newest forms of treatment of lower extremity ischemia, percutaneous dilatation and thrombolytic therapy, are presently useful but somewhat controversial. Percutaneous transluminal angioplasty has been scrutinized by K. Wayne Johnston of Toronto, who has updated and extended his series for this book. The University of Pennsylvania group, represented here by Brooke Roberts, has defined the utility of thrombolytic therapy in occluded arteries and bypass grafts, and has summarized this for us.

Vascular surgeons are called upon to treat unusual problems, and these are the spice of surgical practice. The young claudicant is an example of this. He may have muscular entrapment or adventitial cystic disease. These two entities are discussed by Norman Rich of Walter Reed and John Bergan of Northwestern, respectively. Arteritis may be the problem in patients with necrotic lesions of the toes and fingers. John Joyce of the Mayo Clinic brings the vascular internist's viewpoint to bear on this subject, providing surgeons with an extremely useful opinion. Buerger's disease is seldom recognized in the United States, but in other

parts of the world it is a defined entity. H.H.G. Eastcott of London, long a world traveler, has accumulated a large amount of experience with this disease, and includes the latest work performed in 1983 in his discussion. Vascular surgeons operate on the parasympathetic chain, and must treat causalgia. The treatment is easy, but the diagnosis is difficult. This subject is detailed for us by Wilson Garrett and Jesse Thompson of Dallas. Dr. Thompson's long-time interest in this subject is well known to those who attend vascular meetings in the United States. Hyperhidrosis is not thought to be a surgical problem, except by those dermatologists and internists who see the dramatic cure of incapacitating hyperhidrosis by sympathectomy. Roger Greenhalgh of London has provided a discussion of this subject that reflects his long interest and the influence of Peter Martin on his thinking. Finally, frostbite is with us still in the northern climates of the United States and in the Scandinavian countries. Frostbite has been thoroughly studied, and its treatment defined, by Murray Hamlet of the U.S. Army Research Institute of Environmental Medicine, who provides a fascinating chapter on this subject.

The entire field of treatment of circulatory disorders of the extremities has changed, and will continue to change. Thus, the early studies of frostbite by Shumacker, who now is an authoritative historian, are updated by Hamlet, the physiologic investigator. The changes will continue, but this volume, which is an attempt to summarize the present and point the way to the future, is intended to help those physicians and surgeons who currently treat the difficult problems of vascular disease of the extremities. Whether the objective has been accomplished will be left to the readers, but for our part we have enjoyed selecting the topics, inviting the authorities to join us, and now assembling this volume for their use.

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