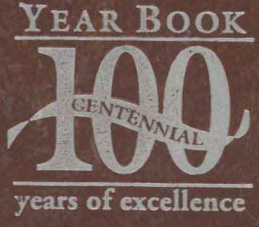
YEAR BOOK®

YEAR BOOK OF VASCULAR SURGERY®

2001



JOHN M. PORTER

2001

The Year Book of VASCULAR SURGERY®

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VASCULAR SURGERY®

Statement of Purpose

The YEAR BOOK Series

The YEAR BOOK series was devised in 1901 by health professionals who observed that the literature of medicine and related disciplines had become so voluminous that no one individual could read and place in perspective every potential advance in a major specialty. That has never been more true than it is today.

More than merely a series of books, YEAR BOOK volumes are the tangible results of a unique service designed to accomplish the following:

- to *survey* a wide range of journals
- to *select* from those journals papers representing significant advances and statements of important clinical principles
- to provide *abstracts* of those articles that are readable, convenient summaries of their key points
- to provide *informed commentary* about their relevance

These publications grow out of a unique process that draws on the talents of outstanding authorities in clinical and fundamental disciplines, trained literature specialists, and professional writers—all supported by the resources of Mosby, the world's preeminent publisher for the health professions.

The Literature Base

Mosby and its editors survey approximately 500 journals published worldwide, covering the full range of the health professions. On an annual basis, the publisher examines usage patterns and polls its expert authorities to add new journals to the literature base and to delete journals that are no longer useful as potential YEAR BOOK sources.

The Literature Survey

More than 250,000 peer-reviewed articles per year are scanned systematically—including title, text, illustrations, tables, and references—by the publisher's team of literature specialists. Each scan is compared, article by article, to the search strategies that the publisher has developed in consultation with the nearly 200 outside experts who form the pool of YEAR BOOK editors. A given article with broad scientific or clinical implications may be reviewed by any number of YEAR BOOK editors, from one to a dozen or more, regardless of the discipline for which the paper was originally published. In turn, each editor who receives the article reviews it to determine whether it should be included in his or her volume. This decision is based on the article's inherent quality, its relevance to readers of that YEAR BOOK, and the editor's goal to represent a comprehensive picture of a given field in each volume of the YEAR BOOK. In addition, the editor indicates when to include figures and tables from the article to help the YEAR BOOK reader better understand the information.

Of the quarter million articles scanned each year, only 5% are selected for publication within the YEAR BOOK series, thereby assuring readers of the high value of every selection.

The Abstract

The publisher's abstracting staff is headed by a seasoned medical editing professional and includes individuals with extensive experience in writing for the health professions. When an article is selected for inclusion in a YEAR BOOK, it is assigned to a member of the abstracting staff. The abstractor, guided in many cases by notations supplied by the physician editor, writes a structured, condensed summary designed to rapidly communicate to the reader the essential information contained in the article.

The Commentary

The YEAR BOOK editorial boards, sometimes assisted by guest contributors, write comments that place each article in perspective. This provides the reader with insights from authorities in each discipline that point out the value of the article and that often reflect the authority's thought processes in assessing the article.

Additional Editorial Features

The editorial boards of each YEAR BOOK organize the abstracts and comments to provide a logical and satisfying sequence of information. To enhance the organization, editors also provide introductions to sections or individual chapters, comments linking a number of abstracts, citations to additional literature, and other features.

The published YEAR BOOK contains enhanced bibliographic citations for each selected article, including extended listings of multiple authors and identification of author affiliations. Each YEAR BOOK contains a Table of Contents specific to that year's volume. From year to year, the Table of Contents for a given YEAR BOOK may vary, depending on developments within the field.

Every YEAR BOOK contains a list of the journals from which articles have been selected. This list represents a subset of approximately 500 journals surveyed by the publisher and occasionally reflects a particularly pertinent article from a journal that is not surveyed routinely.

Finally, each volume contains a comprehensive subject index and an index to authors of each selected article.

The 2001 Year Book Series

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Year Book of Gastroenterology™: Drs Lichtenstein, Dempsey, Ginsberg, Katzka, Kochman, Morris, Nunes, Rosato, and Stein

Year Book of Hand Surgery®: Drs Berger and Ladd

Year Book of Medicine®: Drs Barkin, Frishman, Jett, Klahr, Loehrer, Malawista, Mandell, and Mazzaferri

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Year Book of Neurology and Neurosurgery®: Drs Bradley, Gibbs, and Verma

Year Book of Nuclear Medicine®: Drs Gottschalk, Blaufox, Coleman, Strauss, and Zubal

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Year Book of Oncology®: Drs Loehrer, Eisenberg, Glatstein, Gordon, Johnson, Pratt, and Thigpen

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Year Book of Orthopedics®: Drs Morrey, Beauchamp, Currier, Peterson, Swiontkowski, and Trigg

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Year Book of Pathology and Laboratory Medicine®: Drs Raab, Bissell, Dabbs, Silverman, and Stanley

Year Book of Pediatrics®: Dr Stockman

Year Book of Plastic, Reconstructive, and Aesthetic Surgery®: Drs Miller, Bartlett, Garner, McKinney, Ruberg, Salisbury, and Smith

Year Book of Psychiatry and Applied Mental Health®: Drs Talbott, Ballenger, Eells, Frances, Jensen, Meltzer, Simpson, and Tasman

Year Book of Pulmonary Disease®: Drs Jett, Castro, Maurer, Peters, Phillips, and Ryu

Year Book of Rheumatology, Arthritis, and Musculoskeletal Disease™: Drs Panush, Hadler, Hellmann, Lahita, Lane, and LeRoy

Year Book of Sports Medicine®: Drs Shephard, Alexander, Kohrt, Nieman, Torg, and Mr George

Year Book of Surgery®: Drs Copeland, Bland, Cerfolio, Deitch, Eberlein, Howard, Luce, Seeger, and Souba

Year Book of Urology®: Drs Andriole and Coplen

Year Book of Vascular Surgery®: Dr Porter

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Journals Represented

Mosby and its editors survey approximately 500 journals for its abstract and commentary publications. From these journals, the editors select the articles to be abstracted. Journals represented in this YEAR BOOK are listed below.

Acta Dermato-Venereologica
Acta Neurologica Scandinavica
American Journal of Kidney Diseases
American Journal of Medicine
American Journal of Neuroradiology
American Journal of Public Health
American Journal of Roentgenology
American Journal of Surgery
American Surgeon
Anesthesiology
Annals of Internal Medicine
Annals of Surgery
Annals of Thoracic Surgery
Annals of Vascular Surgery
Annals of the Royal College of Surgeons of England
Archives of Dermatology
Archives of Internal Medicine
Archives of Neurology
Archives of Surgery
Arthritis and Rheumatism
Australasian Radiology
Blood
British Journal of Surgery
Canadian Association of Radiologists Journal
Cardiovascular Surgery
Chest
Circulation
Clinical Orthopaedics and Related Research
Clinical Pharmacology and Therapeutics
Clinical Radiology
European Heart Journal
European Journal of Surgery
European Journal of Vascular and Endovascular Surgery
Gastrointestinal Endoscopy
Journal of Bone and Joint Surgery (British Volume)
Journal of Internal Medicine
Journal of Orthopaedic Research
Journal of Pediatric Surgery
Journal of Pharmacology and Experimental Therapeutics
Journal of Surgical Research
Journal of Thoracic and Cardiovascular Surgery
Journal of Trauma: Injury, Infection, and Critical Care
Journal of Vascular Surgery
Journal of the American College of Cardiology
Journal of the American College of Surgeons
Journal of the American Medical Association
Lancet

Neurology
Neurosurgery
New England Journal of Medicine
Radiology
Stroke
Surgery
Thrombosis and Haemostatis

Standard Abbreviations

The following terms are abbreviated in this edition: acquired immunodeficiency syndrome (AIDS), cardiopulmonary resuscitation (CPR), central nervous system (CNS), cerebrospinal fluid (CSF), computed tomography (CT), deoxyribonucleic acid (DNA), electrocardiography (ECG), health maintenance organization (HMO), human immunodeficiency virus (HIV), intensive care unit (ICU), intramuscular (IM), intravenous (IV), magnetic resonance (MR) imaging (MRI), ribonucleic acid (RNA), and ultrasound (US).

Note

The Year Book of Vascular Surgery® is a literature survey service providing abstracts of articles published in the professional literature. Every effort is made to assure the accuracy of the information presented in these pages. Neither the editors nor the publisher of the Year Book of Vascular Surgery® can be responsible for errors in the original materials. The editors' comments are their own opinions. Mention of specific products within this publication does not constitute endorsement.

To facilitate the use of the Year Book of Vascular Surgery® as a reference tool, all illustrations and tables included in this publication are now identified as they appear in the original article. This change is meant to help the reader recognize that any illustration or table appearing in the Year Book of Vascular Surgery® may be only one of many in the original article. For this reason, figure and table numbers will often appear to be out of sequence within the Year Book of Vascular Surgery®.

Publisher's Preface

The publication of the 2001 YEAR BOOK series marks the 100th anniversary of the original Practical Medicine Series of Year Books. To commemorate this milestone, each 2001 Year Book includes an anniversary seal on the cover. The content and format of the Year Books remain unchanged from the beginning of the last century—each volume consists of abstracts of the best scholarly articles of the year, accompanied by expert critical commentaries.

The first Year Book appeared in 1900 when Gustavus P. Head, MD, produced the first *Year Book of the Nose, Throat and Ear*, a volume consisting of highlights from the previous year's best literature, enhanced by expert observations. Dr Head assembled a small group of distinguished physicians to serve as editors, and the first series of Year Books was published in 1901. The first volumes of the Year Book series—*General Medicine, General Surgery, The Eye, Gynecology, Obstetrics, Materia Medica and Therapeutics, Pediatrics, Physiology,* and *Skin and Venereal Diseases*—appeared at monthly intervals, with 10 volumes published in 1 year. The entire series was met with critical enthusiasm.

In 1904, Dr Head's brother, Cloyd, assumed responsibility for the management of the Year Books. In 1905, the volumes began to appear at regular intervals during the calendar year instead of on a monthly basis. By World War I, the Year Books had been established as an authority on medical and surgical progress.

The postwar period brought about a significant change in the practice of medicine: specialization. To accommodate the rise of specialization in medicine, the Year Books were now sold as individual volumes rather than only as a complete set. This change brought about a tremendous response and sales of the books increased. In 1922, the Year Books became even more specialized, as the books now had different editors for the different medical specialties covered in each volume. Later, in 1933, the title of the series changed from the Practical Medicine Series of Year Books to the Practical Medicine Year Books to reflect these new designs.

The Year Books have grown significantly from the first 10-volume series in 1901 to a diversified series of 32 volumes in 2001. That the Year Book series is the only series of their kind to have survived is a testament to the vision and commitment of its founders. Some minor changes in format and design have occurred throughout the years, but the mission of the Year Book series—to provide a record of exceptional medical achievements distinguished by the reflections of many of the great names in medicine today—has remained constant.

Introduction

With this 2001 YEAR BOOK OF VASCULAR SURGERY, I complete my ninth year as Editor, far longer than I ever anticipated. I have derived considerable enjoyment from this activity and hope it has been as important to your continuing education as it has to mine.

At the outset, I would like to clear up several housekeeping matters. The more astute among you will notice that certain articles have been placed in one section or another, seemingly arbitrarily. I plead guilty to this accusation. While a significant majority of articles lend themselves to precise categorization, a significant minority could easily fit into multiple sections. I have frequently had to make an arbitrary decision.

A second point concerns the matter of the various Camel Awards. In the first place, be informed again these are done in a spirit of good fun, with the intent to entertain and to gently chide, certainly not to insult. Realistically, are there any among us who could not stand a little periodic deflation of pretension? Several book reviewers in recent years have completely misunderstood the Camel Awards, and they have speculated that I deliberately included poor articles to provide a foil for my rapier-like wit. Untrue. I pick articles based on my belief that they have the potential to significantly influence vascular surgery practice. If I find them to be deficient, I am pleased to present the authors an appropriate Camel Prize to indicate my assessment of either the lack of importance of the contribution, the way in which it was prepared, or in recognition of multiple publications. I have never included a poor article simply to serve as a foil for the Camel Award.

Traditionally, at this point in the Introduction I include my assessment of the progress of health care delivery in the United States during the past year. I note without editorial comment that things go poorly for the for-profit HMOs. Their stock prices are depressed, many have been sold, many have been reorganized, and many HMO CEOs have been fired. Basic reality appears inescapable: The only way to save significant money in health care is to render fewer units of health care to the consumer. The HMOs have appropriately responded by raising every barrier under the sun, even to the point where the US Congress has begun to pass several extremely specific and ultimately rather pointless laws prohibiting certain types of HMO behavior. I perceive a basic conflict between the financial well-being of the for-profit HMOs and their stock holders and the best health care interests of the patients. This conflict, in my opinion, is basic and ultimately will doom the for-profit HMO model. The inescapable conclusion is that the United States will simply have to come to grips with some form of universal health care that applies to all our citizens, specifically including the 40 million or so currently with no health insurance at all. The precise type and structure remains clouded in mist, but I suspect it may be closer than we think.

The past year has witnessed a reaffirmation of some old ideas, and there have been interesting new insights. Several studies again confirm the health

benefits of moderate alcohol consumption. Specifically, in this past year we have been informed that moderate alcohol consumption reduces the incidence of ischemic stroke along with the incidence of cardiovascular events and peripheral arterial disease. It specifically appears effective in reducing the rate of sudden cardiac death.

Abundant interest has been focused on the role of the matrix metalloproteinases (MMPs) in the causation of aneurysm. Various tetracyclines have been proved to penetrate aneurysms, and they certainly decrease the activity of MMPs. Perhaps one day soon we will know whether any of the tetracyclines can actually reduce either aneurysm formation or expansion. One of the hottest items in the past year has been the effects of ionizing radiation (brachytherapy), usually administered intraluminally in coronary arteries to reduce postangioplasty fibrosis. The early results several years ago were exciting and filled with promise. In the past year, a number of articles have reported endothelial damage and delayed resorption of thrombus in areas of irradiation, about what one would expect from a structurally damaged arterial segment. The only appropriate conclusion is that we are presently unable to accurately determine potential benefits versus potential harms of vascular brachytherapy. There will surely be a great deal more information to follow.

Many exciting things are happening in the field of coagulation. We are informed that factor XI concentrations above the 90th percentile may play a major role in venous thrombosis, and as many as 11% of all cases of deep venous thrombosis (DVT) in the general population may be attributable to this factor. We also learn that factor VIIIc may have an active role in abnormal coagulation. In recent years, we have been informed that the use of hirudin is appropriate in patients with heparin-induced thrombocytopenia. We are now informed, worrisomely, that hirudin results in antihirudin antibodies in patients, the clinical significance of which is currently uncertain.

In the cardiac area, several studies have described the severely increased risk of acute myocardial infarction in carriers of hemochromatosis. The frequency of this abnormality is astounding—1 in 10 individuals of Northern European extraction. Heterozygous hemochromatosis appears to be associated with a 2- to 3-fold increased risk for occurrence of first myocardial infarction.

In the diagnostic area, a delayed decrease in heart rate during the first minute after the performance of a standard Bruce protocol treadmill test is significant because it appears to accurately predict overall cardiac mortality, and this risk factor appears independent of the level of exercise achieved and the presence of any associated myocardial perfusion defects. To think that we may be able to get very meaningful prognostic information from patients after exercise simply by determining the time required for pulse rate decrease is fascinating. *Chlamydia* DNA and antichlamydial antibodies continue to be found in patients with a significant atherosclerotic burden. Whatever the reason, evidence of *Chlamydia* can be reduced or eliminated by the use of a specific, well-tolerated antibiotic. I wonder if

one day we may routinely prescribe antibiotics to alter the course of atherosclerosis?

In the field of treatment of venous ulceration, abundant evidence attests to the presence of a noxious milieu around a venous ulcer hostile to fibroblasts. Fibroblasts in the region of venous ulcers show senescence, and exudative venous ulcer wound fluid specifically has a negative effect on cell division of healthy fibroblasts. Clearly, there is something in the venous ulcer wound environment that is detrimental to wound healing.

Endovascular activities have abounded during the past year. It has now been confirmed to everyone's satisfaction that the infrarenal abdominal aortic neck continues to dilate in patients with infrarenal aneurysms, and, if this is the site of fixation of an endograft, the potential certainly exists for the development of a type I endoleak with the passage of time. A major publication indicated a failure of any healing between the aneurysm neck and the underlying endograft Dacron after a mean explant time of 9 months. To say this is worrisome understates the matter. Sadly, there have been reports of a number of ruptures of abdominal aortic aneurysms in patients with the AneuRx graft. This is obviously a very worrisome development and the one that I fear will doom the endograft. The overall hospital and patient costs of endovascular repair have been examined; they are certainly no less than the cost of open aneurysm repair and may be significantly higher, depending on the final price of the graft.

Tissue plasminogen activator as treatment for acute ischemic stroke is still being investigated. It appears that this substance may be of some therapeutic benefit if started within 3 hours of symptomatic onset, but there are serious associated drawbacks, including an incidence of intracerebral hemorrhage occurring as a complication of treatment in somewhere between 11% and 30% of patients treated. It appears presently that very few patients can have therapy started within the specified 3-hour time of opportunity, which may be a blessing considering the incidence of intracerebral hemorrhage.

There continues to be interest in the nonoperative treatment of femoral artery pseudoaneurysms caused by catheterization. Compression therapy is losing favor, with thrombin injection emerging as the current treatment of choice. In the past several years, a number of innovative percutaneous closure devices have become available for use in obtaining hemostasis after femoral artery needle puncture. There have been a number of articles in the surgical literature this year attesting to severe complications associated with the use of these devices. It appears that these complications were as much related to operator inexperience as anything else. Now that the cardiologists have begun to follow manufacturer's directions in our own hospital, our incidence of complications has decreased significantly in recent months.

Several dramatic papers inform us that as many as 30% to 50% of all patients with elevated creatinine undergoing elective arteriography have significant increased elevations of creatinine by at least 25% as a complication of the angiographic experience. Hydration appears to be the only protective technique available to help these patients. Contrast selection

appeared to make little difference. In the field of sonographic surveillance of aortic aneurysms, we are informed that 0.78 cm may be the real error of repeat observation on a patient with an aortic aneurysm. This means we may not be able to reliably differentiate the 0.5 cm change we thought was significant, and we may have to increase this to almost 1 cm. Interesting information.

The beneficial role of β-blockers in patients undergoing vascular surgery has been reconfirmed in another very well-conducted study. It seems that we must attempt to place all patients undergoing vascular surgery on preoperative β-blockers, perhaps starting at 7 to 14 days before surgery, with the therapeutic goal being to achieve a heart rate of less than 60 beats per minute preoperatively. The cardiac benefits of this simple treatment are indeed dramatic.

In a study of the use of evoked potentials in carotid surgery, it has been shown with clarity that motor evoked potentials are distinctly superior to somatosensory evoked potentials, a finding confirmed in several independent studies. An important survey was made to determine the incidence and causation of spinal cord ischemia after infrarenal abdominal aortic operation. The author presciently concluded with the comment "spinal cord ischemia after abdominal aortic operation remains a tragically unpredictable, random, and unpreventable event." Enough said.

An important article from Holland compared the effects of renal artery balloon angioplasty to best medical treatment for renal artery hypertension. Remarkably, after 1 year the medical limb of the study and the angioplasty limb had exactly equal blood pressure response, calling into question the role of renal angioplasty for hypertension. The Dutch conducted another important study that randomly assigned patients with infrainguinal bypass to oral anticoagulants or aspirin. Predictably, this well-conducted trial showed no difference in overall bypass occlusion rates between the 2 groups. The difficulty of maintaining patients on warfarin in the target international normalized ratio ranges was noted by the authors. Moderate interest continues in drug treatment of claudication. Presently, a number of drugs give modest benefits in claudicants, including pentoxifylline and cilostazol and, more recently, propionyl-L-carnitine. The latter drug is not yet approved for claudication in the United States.

Several somber take-away messages appeared this year concerning surgical carotid artery disease. One important study indicated that about one third of patients with asymptomatic carotid stenosis already had a silent brain infarct visible on CT scan when first seen. Another study reported 64% of patients with symptomatic carotid stenosis had cerebral infarcts preoperatively that were unchanged postoperatively. New postoperative lesions were demonstrated in 24% of patients. The striking prevalence of infarcts in patients with carotid disease is indeed sobering.

In another study directed toward carotid disease, Dr Barnett and associates from the NASCET Study have conducted a remarkable prospective randomized trial examining the effects of different doses of aspirin in patients undergoing symptomatic carotid endarterectomy (CEA). Remarkably, this study emphatically confirmed that the risk of stroke, myocardial

infarction, death within 30 days, and death within 3 months of CEA was markedly lower in patients taking either 81 or 325 mg of aspirin per day, compared to those taking more. This is startling information. While the reasons for the differences in benefit are not clear, and it is possible these results should not be extended to medically treated patients, it does seem clear that postsurgical carotid patients are optimally treated with only one baby or one regular aspirin per day and no more.

Dr Barnett has produced several other papers of interest this year. He examined the cause of strokes in patients with carotid disease and concluded that in patients who had asymptomatic 60% to 99% stenosis, only 45% of subsequent strokes were caused by the carotid disease. Perhaps even more remarkably, only 78.4% of strokes occurring in patients who had symptomatic carotid disease appeared causally related to the stenotic cervical carotid. These studies together suggest that we must be quite cautious in ascribing stroke causation to cervical carotid disease. A major study from Rochester, Minn, this past year indicated that of all strokes occurring in the community, only 16% were attributable to carotid artery disease.

The infatuation for the treatment of infected infrarenal aortic grafts with in situ prosthetic grafts or allografts continues. In my opinion, there remains abundant evidence that axillobifemoral grafting through a clean remote field followed by excision of the infected graft gives every bit as good or superior results. Allografts attracted attention in another area, namely the performance of fresh allograft bypass grafts below the knee for limb salvage. These grafts, remarkably, were harvested from brain-dead donors and, after a week or so in cool solution with antibiotics, were used without modification as femoropopliteal-tibial bypasses. Primary patency was a disappointing but not dreadful 48% at 1 year. Perhaps we will hear more about the use of fresh allografts for lower extremity bypass.

A potentially profoundly important article was published this year from the Brigham and Women's Hospital that reported the early patency of lower extremity vein grafts after genetic modification with viral transfection. An antisense oligonucleotide that blocks cell cycle gene expression and thus blocks neointimal hyperplasia was induced. After a short follow-up, the patients with the transfected grafts had a higher rate of patency than those with control grafts, but it must be pointed out this was a small patient group followed up for a short time. Nonetheless, these results are potentially earth-shaking.

The use of a prophylactic vena caval filter in trauma patients has continued to attract attention. While some persist in believing selected use is beneficial, the very experienced trauma center personnel at the University of California, Davis, concluded from a careful review of their experience that the high-volume use of vena caval filters did not reduce the overall incidence of pulmonary embolism, and they have abandoned prophylactic caval filter implantation.

The importance of occult cervical vascular injuries in patients with trauma was emphasized again this year. The very active trauma group at the University of Colorado, Denver, has begun obtaining cervical arteri-