Controversies in Neurological Surgery

Neurovascular Diseases

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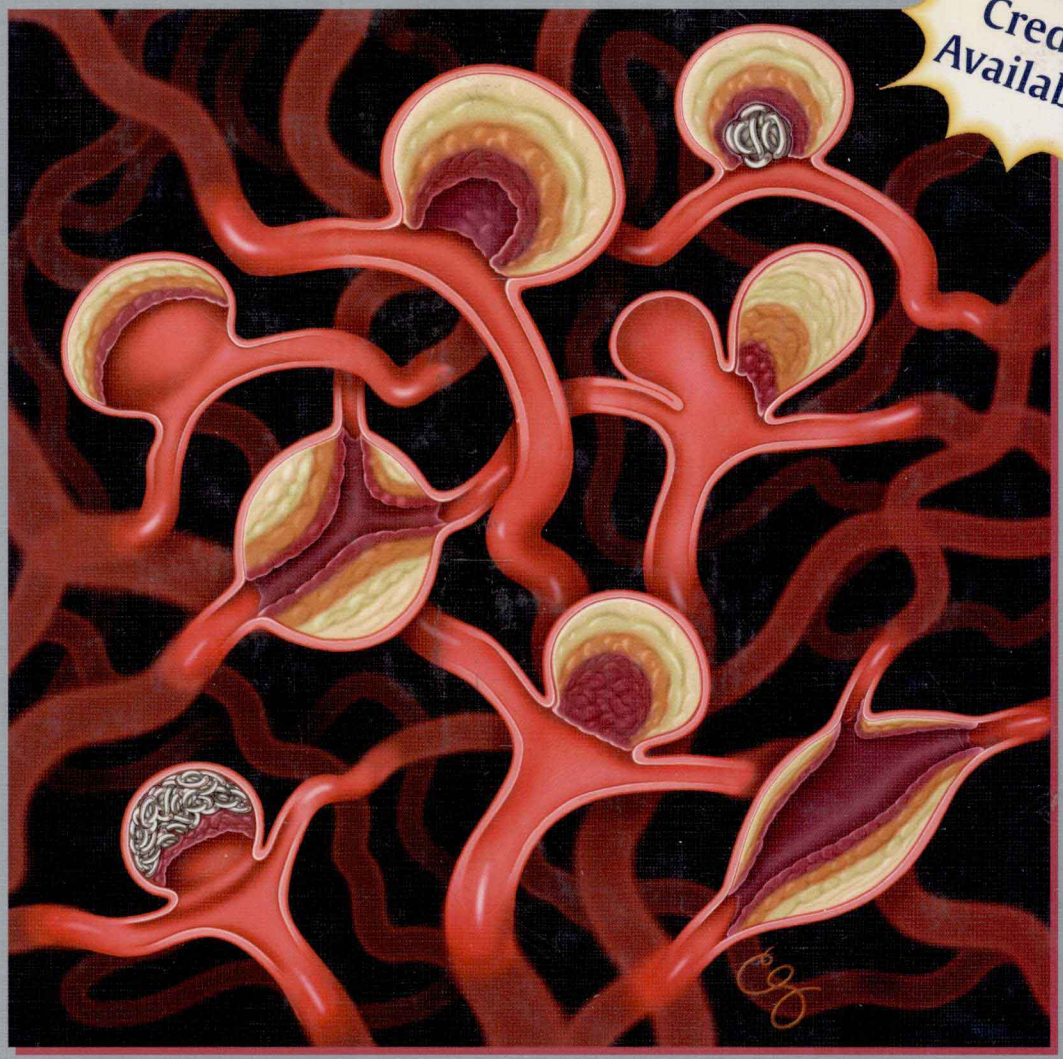
CME Credit Available



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Controversies in Neurological Surgery: Neurovascular Diseases

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Dedication

To Suzanne, for your steady love and support

To Alexandra, Simone, and Blake, for reminding me always about balance

Michael T. Lawton, M.D.

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Foreword

One of the most gratifying aspects of a long career in medicine is enjoying the clinical and academic successes of one's students, especially those actively involved in charting the future of the discipline. Such successes have been abundant in the case of Michael Lawton. Even as a resident, it was clear that he would assume a place among the leaders pushing the boundaries of neurosurgery. During his training, more than one colleague remarked that Michael had the "best pair of hands" in the operating room. And his expertise was not confined to the clinical arena. I believe that Michael still holds the record for the number of research articles published by a neurosurgical resident at Barrow Neurological Institute—more than 60 as I recall and a phenomenal level of productivity by anyone's standards. His research was both solid and innovative—he had a decided knack for bringing a fresh perspective to data whose analysis others might have already considered completed—pushing the envelope just a bit further in the process to uncover novel and heuristic interpretations. Not surprisingly then, within a few years of assuming his position at the University of California, San Francisco, Michael has doubled the number of his publications and obtained tenure while continuing to advance his clinical level of excellence.

Now Michael, along with his talented co-editors Daryl Gress and Randall Higashida, has compiled and edited this textbook devoted to some of the thorniest issues that cerebrovascular surgeons currently confront and will confront in the future. The impressive list of contributors to *Controversies in Neurological Surgery: Neurovascular Disease,* includes experts both old and new—those who have defined neurosurgery as we know it today and those who will do so in the future. Readers will benefit from the frank discussions of treatment strategies for the most challenging cerebrovascular diseases by some of our foremost practitioners. Equally important they will find thoughtful analyses on the economics and patterns of neurosurgical practice. Few neurosurgeons receive adequate formal training on these issues. Nonetheless, they are issues that can affect a clinical practice as much as, if not more, than clinical or technological advances. Indeed, we do well to remember that we do not operate in a vacuum; larger social concerns can literally determine how we practice medicine, if at all. Both established practitioners and trainees pursuing their goal of becoming neurosurgeons will benefit from this discussion.

I note with particular satisfaction the contribution from my own neurosurgical mentor, Charles Wilson, to this text, his chapter, "The Medical Marketplace." On a personal level, joining Dr. Wilson and Dr. Lawton in this volume feels rather like a portrait of my extended family—a satisfying one at that.

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Preface

The practice of neurological surgery is becoming increasingly complex. Sophisticated molecular techniques increase our understanding of neurological diseases and evolving technology expands our therapeutic armamentarium. This increasing complexity demands neurosurgical subspecialization to augment clinical volume and foster expertise. However, narrow clinical focus can also breed bias, competition, and controversy. These responses can be positive when they spur innovation, improve patient outcomes, and heighten standards of excellence, but can also be negative when they ignite discord, engender suspicion, and impede progress. Nowhere are these elements more pervasive than in the field of neurovascular surgery, where endovascular techniques have become a legitimate alternative to open neurosurgical techniques.

In this textbook we explore some of the controversies in neurovascular surgery. Leaders in neurosurgery, endovascular surgery, and interventional neuroradiology were invited to express openly their perspectives and practices, with an emphasis on decision-making and the "art" of medicine, rather than on the techniques and results, which are elaborated abundantly in so many other textbooks. Some of the most challenging moments occur in the office, after explaining the various treatment options and published reports, when an anxious and overwhelmed patient begs for a recommendation or guidance, and the clinician must leap beyond evidence and steer a patient safely, ethically, and without bias. This book is intended to help in those moments, because the exploration of controversy often defines critical issues and clarifies hard choices that we ask our patients to make today, choices that we once made for them or that did not exist before.

The book has three sections. The first section examines future trends in open cerebrovascular surgery, endovascular techniques, molecular and genetic therapies, and finally economic factors. The second section focuses on specific clinical controversies associated with aneurysms, arteriovenous malformations, dural arteriovenous fistulas, cavernous malformations, and atherosclerotic diseases, presenting the differing perspectives of cerebrovascular surgeons and endovascular surgeons. The third section examines organizational issues, like structuring a practice to integrate different subspecialists, and training specialists for the future. Hopefully, this textbook will paint a picture of the future of this rapidly evolving, interdisciplinary, and highly controversial specialty. The specialty's future will be bright if we share experiences, remain flexible in our approaches, and work together closely despite our differences. Controversy should not threaten collaboration, but should spark creativity, thoughtful analysis of current practices, and innovative therapies for patients with cerebrovascular diseases.

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■ SECTION I ■

Trends in Neurovascular Medicine

1

Trends in Neurovascular Surgery

BRIAN A. O'SHAUGHNESSY, RICHARD J. PARKINSON, BERNARD R. BENDOK, CHRISTOPHER C. GETCH, AND H. HUNT BATJER

Objectives: Upon completion of this chapter, the reader should be able to identify advances in the microsurgical management of aneurysms, arteriovenous malformations, dural arteriovenous fistulas, cavernous malformations, and ischemic diseases of the brain.

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The last decade has met with remarkable advances in the surgical treatment of neurovascular disease as well as an improved comprehension of the neurophysiology that underpins its basic science. Many of the advances in clinical neurovascular disease have resulted from the considerable refinements in neuroendovascular techniques, which have paved the way for a variety of new and exciting treatment options for complex diseases of the cerebral vasculature. Terms such as superselective angiography, microcatheter-based embolization, and stent-assisted coiling are now commonplace in both our literature and daily vernacular. While many of us have been quick to educate ourselves about new technologies in an attempt to provide the best possible therapies for our patients, we must adopt these treatments carefully and do so with a degree of cautious optimism. New strategies for the management of disease, while very intriguing and increasingly promising, must measure up to the existing techniques with regard to safety and efficacy to earn a firm place in modern treatment practices. We must strike the proper balance between technical innovation and patient safety.

The multitude of recent technological innovations developed for the management of neurovascular disease has created a paradigm shift with regard to our practice environment. A multidisciplinary group of physicians, each possessing a subspecialized training background, is now making the important therapeutic decisions, as opposed to a single individual. The modern neurovascular group is typically composed of neurovascular surgeons, neuroendovascular surgeons, neuroradiologists, neuroanesthesiologists, stroke neurologists, critical care physicians, and physiatrists. By discussing the challenging problems we face in our practices in a collaborative manner, we can consider a variety of different perspectives in a professional setting, thereby facilitating a more integrative approach to disease management. With the increased development of these combined neurovascular groups throughout the world, as well as the costly technology needed to support them, patients with complex neurovascular lesions disease routinely will be referred to large tertiary referral centers for the treatment of their disease. In concert with this recent paradigm shift in practice environment, there is a similar