

PREFACE

Since the first carotid angioplasty that was performed in 1980, this technique has undergone tremendous modifications and improvements. Stents for the carotid artery were utilized in the early 1990s, and emboli protection devices were introduced about 2000. Advances in equipment (guidewires, catheters, balloons, stents, and emboli protection devices) have improved the technical success and safety of carotid stenting. With the recent SAPHIRE publication revealing non-inferiority of carotid stenting compared with carotid endarterectomy for high-risk surgical patients, this percutaneous procedure is now considered a viable alternative to endarterectomy for these patients. In fact, the FDA has approved carotid stenting for high-risk patients using the AccuLink™ stent and AccuNet™ device (Guidant Corporation, Santa Clara, CA) in August 2004, and the Xact™ and EmboShield™ system (Abbott Vascular Devices, Redwood City, CA) in September 2005.

Increasing numbers of carotid stenting are being performed around the world, and established interventionalists and trainees alike are seeking to be instructed in performing this meticulous procedure. Unfortunately, there are insufficient well-established peripheral vascular training programs to meet this increasing demand. Only a small proportion of current trainees are enrolled in fellowship programs with dedicated carotid interventional training that perform high-volume extracranial carotid stenting; even fewer are enrolled in programs that also partake in intracranial and acute stroke interventions. In North America, this shortage of dedicated training programs leaves interested interventionalists pursuing carotid stent training through short educational courses, and often haphazard and limited “hands-on” experience in other institutions.

The purpose of our *Handbook of Complex Percutaneous Carotid Intervention* is to provide a learning resource to complement the “hands-on” training of established interventionalists and trainees. This handbook is intended for various disciplines participating in the management of patients with carotid and vertebral artery stenosis, including interventional cardiologists, vascular surgeons, interventional radiologists, and interventional neurologists. The focus of this handbook is on percutaneous intervention of patients with extracranial carotid artery stenosis. As interventionalists of the cerebrovasculature are often faced with stenosis involving other cerebral vessels, we complemented our handbook with sections on percutaneous interventions of intracranial stenosis, vertebral artery stenosis, and acute stroke.

We have provided a detailed introduction to the techniques of extracranial and intracranial, carotid, and vertebral interventions. We reviewed the indications, approaches, equipment, and potential complications of these percutaneous interventions. As many patients undergoing such procedures are elderly and high-risk with challenging anatomy, we also provided some useful pearls and troubleshooting of technically difficult cases. In addition, our section on challenging cases illustrates our approach to frequently encountered challenges at the Cleveland Clinic.

The *Handbook of Complex Percutaneous Carotid Intervention* is also meant to provide a comprehensive review of the management of carotid artery stenosis. Thus, we have

included chapters reviewing the epidemiology and significance of carotid stenosis, medical therapy, noninvasive and invasive imaging of the carotid artery, and carotid endarterectomy. In this current era of evidence-based medicine, we have also included chapters reviewing sentinel studies supporting carotid endarterectomy and carotid stenting.

Carotid stenting is an exciting and burgeoning field. It is often a challenging procedure, which may expose patients to life-threatening complications. Its success as the preferred revascularization therapy of high-risk patients is contingent upon low periprocedural complications, which in turn is highly dependent on operator skills. As studies comparing carotid stenting and endarterectomy for low-risk patients are completed, we may see a further increase in the volume of carotid stenting. We hope that our *Handbook of Complex Percutaneous Carotid Intervention* will provide a useful resource to guide interventionalists through this challenging and important revascularization procedure of the 21st century.

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