Strictly defined, vascular surgery involves performing procedures on blood vessels outside the heart and brain. Although this definition is technically accurate, it only scratches the surface of vascular surgery in the twenty-first century. Vascular surgeons operate on arterial and venous disease, repair hemorrhagic injuries, perform endovascular interventions, create vascular access, and manage diabetic foot infections to name just a few areas of practice. Although vascular surgery emerged as a subspecialty in the 1980s, this field still plays an important role in general surgery training and practice. Since fewer than 3,000 board certified vascular surgeons practice in the USA, many general surgeons rely on their vascular surgery experience during residency to treat patients with vascular problems. In a recent review of operative logs from nearly 5,000 surgeons, the American Board of Surgery found that general surgeons performed 46% of vascular surgery procedures [1]. Although efforts to increase the number of vascular surgeons have begun, general surgeons will continue to care for vascular patients given the rapidly increasing elderly population and the comparatively small number of residency and fellowship trained vascular surgeons entering the work force each year. Unfortunately, the training that general surgery residents receive in vascular surgery has become less consistent as vascular practice moves toward endovascular therapy. For many general surgery residents, the breadth of their case volume in vascular surgery experience has narrowed to dialysis access, amputation, and varicose vein management.

Therefore, finding an appropriate reference book for general surgeons who treat vascular patients can be challenging. Multi-volume textbooks of vascular surgery provide an extremely detailed and comprehensive approach to vascular conditions that may not readily translate into real-world practice. At the other extreme, general surgery textbooks condense vascular surgery into a few chapters that often lack the technical details and treatment guidelines valued by a practicing surgeon. This book directly addresses the needs of general surgeons who perform vascular surgery during residency training, clinical practice, or both. As a clinically oriented resource this book focuses on the diagnosis and clinical management of vascular conditions while describing the technical details and pitfalls to avoid when performing common vascular surgery procedures. Ideally this book will serve as a “one stop” information source that surgeons and trainees will turn to as a valuable reference, surgical atlas, and study guide.

The contributing authors have used clear illustrations and evidence based treatment recommendations to create clinically relevant chapters. The first chapter provides an organized approach to the vascular patient with an emphasis on history, physical exam, risk factors, and diagnostic options. Most vascular conditions require some form of physiologic study or imaging exam to clarify the diagnosis and assist with treatment planning. Chapter 2 lays the foundation for successful vascular surgery by illustrating common vascular exposures and describing fundamental technical principles unique to arterial surgery. The rest of the book is organized into parts on arterial disease, venous disease, vascular trauma, vascular access, and complex vascular conditions.

The chapters on acute arterial disease outline the management and surgical techniques for the treatment of acute limb ischemia, compartment syndrome, and diabetic foot infections. Restoring flow to an acutely ischemic limb is one of the defining interventions of vascular surgery. In many cases, an expeditious surgical thrombectomy as described in Chap. 3 can be the
difference between limb salvage and major amputation. Likewise, compartment syndrome represents a limb threatening condition that may require immediate intervention by a general surgeon. Chapter 4 explains and illustrates the steps involved in a fasciotomy which can be a limb saving procedure. Diabetic foot infections are included in this part (Chap. 5) because of their tendency to require acute surgical intervention. Failure to recognize and adequately debride diabetic foot infections when indicated can have devastating local and systemic consequences.

Chronic arterial disease is addressed in chapters on the management of claudication, critical limb ischemia, and lower extremity amputation. Peripheral arterial disease (PAD) affects tens of millions of patients and can cause disabling symptoms. Chapter 6 discusses the diagnosis and risk factors associated with claudication while providing an overview of the medical, endovascular, and surgical treatment options. Chronic critical limb ischemia can manifest as ischemic rest pain, non-healing ulcers, or gangrene. Chapter 7 focuses on recognizing critical limb ischemia and preparing patients for limb salvage which may involve surgical, endovascular, and medical therapy. In some patients, complete limb preservation is not possible and an amputation is required. A well performed amputation of the toe, forefoot, or leg can have a significant impact on a patient’s recovery potential and quality of life. Chapter 8 provides guidelines for choosing the appropriate level of amputation and gives a detailed description of several common amputations.

The part on venous disease includes chapters on deep and superficial venous thrombosis, chronic venous insufficiency, varicose veins, and inferior vena cava (IVC) filter placement. Acute deep venous thrombosis (DVT) poses an immediate life threatening problem if it becomes a pulmonary embolism (PE) and a long term disability risk if it causes venous dysfunction. Chapter 9 discusses the medical, endovascular, and surgical treatment modalities for acute DVT which are aimed at minimizing the short and long term clinical impact of venous thrombosis. Rarely, anti-coagulation failure or contraindication warrants placement of an IVC filter to reduce the risk of pulmonary embolism. Chapter 13 outlines the indications and risks associated with IVC filters and describes the technical aspects of placing and retrieving IVC filters. Superficial venous thrombosis (SVT) can complicate intravenous access and may become an important clinical problem with the increasing use of peripherally inserted central catheters (PICC lines). Chapter 10 provides practical guidelines for recognizing and managing SVT. Chronic venous disease encompasses a wide spectrum of clinical disorders ranging from spider veins to non-healing venous ulcers. Chapter 11 focuses on the pathophysiology and non-interventional treatment strategies for chronic venous insufficiency while Chap. 12 describes various techniques for treatment of varicose veins and superficial venous insufficiency.

The part on vascular trauma emphasizes surgical intervention for blood vessel injuries that occur in the neck, abdomen, and extremity. Modern management of vascular neck trauma incorporates the injury location, hemodynamic status of the patient, and imaging results. Chapter 14 describes the surgical approach and technical details involved in repairing arterial and venous injuries in each anatomic zone of the neck. Abdominal vascular injuries often prove to be fatal without prompt surgical exposure and effective vascular control. Chapter 15 illustrates and explains the maneuvers necessary to isolate, clamp, and repair the major abdominal vessels. Extremity vascular trauma poses an ischemic and hemorrhagic risk which may require immediate revascularization or temporary stabilization followed by delayed definitive repair. Chapter 16 reviews the management of extremity vascular injury including anatomic exposures, the use of tourniquets and shunts, and revascularization principles.

All surgeons regularly encounter patients with vascular access issues. Nearly half a million people receive hemodialysis in the USA, and most critically ill patients require some form of central venous access. Chapter 17 provides an overview of venous access options and describes insertion techniques aimed at maximizing safety and efficiency. Establishing and maintaining hemodialysis access can be a challenging undertaking that requires planning, persistence, and technical skill. Chapter 18 illustrates and explains the most common arteriovenous access procedures while Chap. 19 focuses on the recognition and management of vascular access complications.
The final part covers a wide range of vascular topics that are associated with more complicated clinical issues. These chapters provide a broad overview of the diagnosis and treatment principles for vascular conditions that usually warrant referral to a vascular specialist. Chapter 20 summarizes the most recent data and guidelines for managing patients with carotid, renal, and mesenteric stenosis. Chapter 21 describes the surgical and endovascular treatment options for aortic pathology including dissections, aneurysms, and traumatic transections. Non-atherosclerotic diseases often pose a diagnostic challenge because of their rarity and unusual clinical manifestations. Chapter 22 provides a well-organized and concise reference for evaluating patients with hypercoaguable disorders, vasculitis, and other uncommon conditions. All surgeons caring for vascular patients must be prepared to recognize and treat hemorrhagic and infectious complications. Chapter 23 uses clear treatment algorithms to explain the management of common complications associated with vascular surgery and endovascular interventions.

Approximately 75% of general surgery residents plan to pursue fellowship training in one of a dozen or more clinical areas [2]. Despite this trend toward subspecialization, general surgeons still derive benefit from their training and experience in vascular surgery. The ability to control bleeding, restore perfusion, establish vascular access, and manage the increasing number of patients with atherosclerotic and venous disease remain valuable skills for general surgeons. Practicing surgeons and surgical trainees can now turn to this book as a concise and clinically oriented information source for vascular surgery.

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References

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