

Preoperative Evaluation of the Vascular Surgery Patient



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KEYWORDS

- Vascular surgery • Preoperative evaluation • Endovascular • Cardiac clearance
- Contrast nephropathy

KEY POINTS

- Patients requiring vascular surgery are complex with multiple comorbidities.
- Minimally invasive surgical techniques allow procedures to be done in high-risk patients.
- Vascular surgical procedures are ever evolving with variable intraoperative management concerns that should be considered in the preoperative assessment.
- Risk assessment for perioperative morbidity and mortality should seek variables that can be improved before surgery.

INTRODUCTION

Patients requiring vascular surgery present a multitude of perioperative challenges due to increasingly complex comorbidities in an ever-aging patient population. This, coupled with less-invasive surgical techniques that allow more patients to be considered “acceptable” surgical candidates, creates the need for effective preoperative anesthetic evaluations.

Patients requiring vascular surgery often have preexisting cardiovascular, pulmonary, renal, and endocrine dysfunction, and it is not surprising that morbidity is higher, and long-term survival is lower than for patients having nonvascular procedures. Some of these comorbidities may not have been recognized or have been poorly managed at the time of surgical presentation. Feringa and colleagues¹ noted that unrecognized myocardial infarction and silent myocardial ischemia were detected in

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23% and 28%, respectively, of vascular surgery patients studied; these patients had a worse survival compared with patients with no symptoms or signs of coronary artery disease (CAD).

Layered on the baseline patient characteristics are the complexity and challenges inherent to the various vascular procedures themselves. The anesthesia care team must not only have a firm grasp of concurrent disease processes, but also must be familiar with the particular surgical procedure and integrate the consequences of the surgical procedure on baseline disease. Further, the introduction of endovascular surgical techniques changed the specific needs of intraoperative anesthetic care. For example, endovascular repair of abdominal aortic aneurysms (AAA) has surpassed open repair across all age groups,² eliminating the consequences of prolonged aortic clamping, but introducing the need for new monitoring and evaluation strategies.

This review uses a systems-based approach to presurgical patient evaluation, followed by a discussion of the anesthetic implications of specific vascular procedures and overall risk.

SYSTEMS-BASED PREOPERATIVE EVALUATION

Cardiovascular Assessment

Patients with vascular disease frequently suffer from concurrent cardiac disease. As a result, cardiac evaluation and optimization are a primary component of preoperative assessment. Standard preoperative cardiac assessment includes an appraisal of baseline health status, exercise tolerance, and electrocardiogram (ECG) analysis. Abnormal findings on history or ECG should prompt further noninvasive cardiac testing to assess the response to exercise, as well as an estimate of ventricular reserve and myocardium at risk. Testing must be coordinated with cardiology and may include routine treadmill assessment, stress echocardiography, and nucleotide studies.

Abnormal findings on these tests may result in percutaneous interventions and/or coronary revascularization, but the degree of testing and subsequent intervention must be balanced against the level of proposed surgical insult. For example, patients undergoing arterial-venous graft revision or percutaneous lower-extremity procedures may incur less intraoperative physiologic trespass than an open AAA or carotid artery repair, despite the high risk for perioperative complications. A risk/benefit analysis also must be considered with the preoperative evaluation to assess whether a particular test will alter the approach to patient care.

This methodology is supported by the American College of Cardiology (ACC) and American Heart Association (AHA) recommendations, which include the suggestion that preoperative cardiac testing should be considered only if the results would impact the proposed anesthetic and surgical management plan.³ Using the updated 2007 ACC/AHA recommendations and their recent meta-analysis, Omar and colleagues developed useful and practical algorithms for preoperative cardiac assessment before vascular surgery for (1) patients with stable or asymptomatic CAD and (2) patients with CAD (**Figs. 1** and **2**).

It is particularly important to elicit a history of coronary stent placement in the vascular surgical population. There is a high incidence of morbidity and mortality associated with surgical procedures being performed within 6 months of stent placement, and with premature cessation of antiplatelet therapy resulting in in-stent thrombosis. Current guidelines recommend the following: (1) elective surgery after drug-eluting stent (DES) implantation should be delayed until completion of 1 year of dual antiplatelet therapy, and (2) if surgery is urgent, it should be performed without cessation of antiplatelet therapy.⁴

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