Optimal Perioperative Medical Management of the Vascular Surgery Patient

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KEYWORDS

• Vascular surgery • Carotid stenosis • Abdominal aortic aneurysm • Troponin leak • β-blocker • Glucose control • Anesthesia • Cerebral hyperperfusion

KEY POINTS

- Moderate tight glucose control is currently the safest approach for patients undergoing vascular surgery.
- Use of statins during the perioperative period decreases complications during vascular surgery.
- General anesthesia should be avoided, when possible, for endovascular abdominal aortic aneurysm repair.
- Risk stratification based on troponin leak can be considered for patients undergoing vascular surgery.
- In patients undergoing carotid artery endarterectomies cerebral near-infrared spectroscopy can help detect cerebral hyperperfusion, which can be prevented with early identification and control of blood pressure.

INTRODUCTION

High-risk vascular patients undergoing complicated procedures can benefit from anesthesia providers managing preoperative, intraoperative, and postoperative care. As health care evolves, comprehensive perioperative management of patients will become more dependent on involvement of anesthesiologists in the delivery of high-quality, evidence-based medicine to all surgical patients.

PREOPERATIVE MANAGEMENT

Preoperative management of patients undergoing vascular surgery can be complicated because these patients often have coexisting cardiac, pulmonary, cerebrovascular,

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endocrine, and renal comorbidities. A preoperative evaluation should focus on optimizing comorbid conditions and minimizing perioperative risk.

Cardiovascular Evaluation

Major vascular surgeries represent the highest-risk procedures for cardiovascular morbidity and mortality.[1] Open vascular surgery, such as repairs of the aorta and visceral arteries, and lower limb revascularization, is considered high risk, whereas endovascular repairs, carotid endarterectomies, and percutaneous extremity angioplasties should be considered intermediate risk.[1,2] Dialysis access procedures, varicose vein procedures, and minor amputations involving digits should be considered low risk.[2] Any emergent or urgent vascular surgery should be considered high risk.[2]

As the prevalence of coronary artery disease (CAD) is approximately 50% in patients undergoing vascular surgery,[3] a 12 lead electrocardiogram should be considered for all patients presenting for surgery. Stress testing is not predictive of myocardial morbidity or mortality, and should only be recommended in patients with unstable angina or an active arrhythmia.[4,5] In these patients, exercise stress testing should be performed when possible. In patients unable to exercise, which is not uncommon in vascular surgery patients, dobutamine stress echocardiography (DSE) or myocardial perfusion scintigraphy can help predict perioperative cardiac events in patients undergoing noncardiac surgery. If there are signs of active ischemia and the patient is symptomatic, he or she should undergo coronary angiography.[4]

Analysis of the results of the Coronary Artery Revascularization Prophylaxis (CARP) trial reveals that the only groups who benefit from revascularization before vascular surgery are those with unstable CAD or left main coronary artery disease.[2,6,7] For patients proceeding with surgery, percutaneous coronary intervention (PCI) can proceed preferably 6 weeks after surgery.[2] After successful PCI, vascular surgery should ideally be scheduled at least 1 month after deployment of a bare-metal stent and 1 year after drug-eluting stent deployment, to decrease the risk of stent thrombosis secondary to discontinuing dual-antiplatelet therapy prematurely.

A large, multicenter, prospective review by Stone and colleagues[8] demonstrated that clopidogrel is not associated with major bleeding complications after vascular surgery. In this study, patients in whom clopidogrel was continued either alone or as part of dual-antiplatelet therapy did not have significant bleeding complications, including reoperation or transfusion, compared with patients on aspirin alone or no therapy. Saadeh and Sfeir[9] confirmed these findings in a prospective, nonrandomized study demonstrating that dual-antiplatelet therapy up to the day of surgery is also not associated with bleeding complications. Hence, clopidogrel and/or dual-antiplatelet therapy may be safely continued in patients with recent stents or those with symptomatic carotid disease when surgery is necessary before completion of the recommended course of therapy.

There is debate regarding the optimal timing for elective vascular surgery following revascularization via coronary artery bypass grafting (CABG). A retrospective review by Paty and colleagues[10] concluded that repair of large abdominal aortic aneurysms (AAAs) should be performed early (median interprocedure interval of 11.5 days) after CABG to decrease the interprocedural risk of rupture. Hence, the timing of vascular surgery after CABG needs to be determined on an individual basis, taking into account the urgency of the vascular surgery, the risks of rupture or worsening vascular disease in the immediate postoperative cardiac surgery period, and the risks of early and late cardiac events.

In patients presenting for emergent or urgent surgery with a questionable cardiac history, the anesthesiologist with expertise in perioperative echocardiography may