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Preoperative Testing—A Bridge to Nowhere:

A Teachable Moment

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Story From the Front Lines

A 61-year-old man presented to his primary care physician reporting increasing right lower extremity discomfort after walking. The patient was a former smoker and had a history of dyslipidemia, hypertension, type 2 diabetes mellitus, carotid endarterectomy, and remote stenting of the right common iliac artery. Angiogram confirmed a right superficial femoral artery occlusion and distal 50% stenosis with ankle-brachial index showing moderate distal arterial disease. The patient initiated a walking program and his medical therapy was optimized, but his symptoms progressed over the next 12 months. He was referred to a vascular surgeon who requested preoperative cardiac “clearance” and referred him for cardiac stress testing, although there was no history of chest pain or myocardial infarction. The patient’s ambulation was limited by lower extremity pain, but he described no other limits on activity. A persantine myocardial perfusion single-photon–emission computed tomographic scan showed a normal ejection fraction, normal biventricular function and size, and no evidence of prior infarction or regional ischemia but did identify an equivocal transient ischemic dilatation at rest. Given this result, coronary angiography was ordered and showed multivessel stenosis: 60%left main, 90% left anterior descending, and 80% posterior descending arteries. The patient did not undergo percutaneous intervention. Instead, he was referred to a cardiothoracic surgeon for coronary artery bypass grafting (CABG) to manage coronary artery disease prior to consideration of lower extremity intervention. All the while, he continued to have lower extremity claudication and was without chest symptoms.

Three months later, the patient underwent a 3-vessel CABG. His complicated postoperative course necessitated 2 weeks’ use of an intra-aortic balloon pump in the cardiac intensive care unit. Postoperatively, he complained of numbness of the left upper extremity. An upper extremity and chest contrast-enhanced computed tomographic scan showed greater than 50% stenosis of the left subclavian artery. After further recovery as an outpatient, he returned to the hospital 1 month later and underwent another cardiac catheterization to

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reassess coronary disease prior to the planned left subclavian artery stenting. The angiogram revealed nonpatent coronary artery bypass grafts including a newly atretic left interior mammary artery graft, which indicated that the CABG had failed. Unfortunately, after many months of diagnostic procedures and high-risk invasive interventions, the patient's clinicians now believed that he was too high risk for open intervention to alleviate lower extremity symptoms. Nearly a year after his presentation, the patient ultimately underwent outpatient percutaneous stenting of his right lower extremity arterial blockage with improvement in lower extremity claudication. He also underwent percutaneous stenting of his left upper extremity with some improvement in numbness.

Teachable Moment

This patient presented with lower extremity claudication, and a series of well-intentioned cardiac tests of uncertain benefit led to multiple complications. His cascade of preoperative testing resulted in delays in addressing the patient's primary symptom, higher cost, iatrogenic complications, and several redundant invasive tests and interventions. First-line therapy for all atherosclerotic disease such as claudication is prescribing an exercise intervention along with optimizing the medical regimen, prior to consideration of invasive interventions. Studies currently under way may further clarify the role of angioplasty vs open bypass of superficial femoral artery occlusions.[1]

In preoperative evaluation for possible lower extremity bypass surgery, little substantial information was gained through aggressive testing in the case of this patient. The patient's goal was to relieve symptoms of lower extremity claudication. Prior to undertaking an open repair, the vascular surgeon carefully considered that this patient may be too high risk for this surgery. However, guidelines recommend against testing for stable ischemic cardiac disease in patients undergoing noncardiac surgery with reasonable functional status as in this patient.[2,3] The result of his nuclear stress test was equivocal, which then led to coronary angiography and a diagnosis of asymptomatic coronary artery disease. Finally, even with multivessel disease, revascularization prior to noncardiac surgery has not been demonstrated to improve outcomes.[4] Once invasive testing reveals disease, clinicians must overcome the diagnostic-therapeutic cascade, in which treatment decision making reflects diagnostic testing itself, not anticipated treatment benefit or potentially the clinical circumstance of the individual patient.[5] In this case, the CABG ultimately failed and was also complicated by near death and upper extremity morbidity.

In the end, the irony was that the preoperative workup and interventions ordered to "clear" the patient for lower extremity bypass ultimately led to complications that negatively affected his quality of life and resulted in him being considered too high risk for the intervention to address his presenting symptom of claudication. This challenging situation is a reminder that interdisciplinary medical decision making must always focus primarily on achieving the patient's goals. Careful consideration must be given to the implications and risks of preoperative diagnostic testing without established clinical benefit.

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References

1. Malas MB, Qazi U, Glebova N, et al. Design of the Revascularization With Open Bypass vs Angioplasty and Stenting of the Lower Extremity Trial (ROBUST): a randomized clinical trial. JAMA Surg. 2014; 149(12):1289–1295. [PubMed: 25353642]
2. Wolk MJ, Bailey SR, Doherty JU, et al. American College of Cardiology Foundation Appropriate Use Criteria Task Force. ACCF/AHA/ASE/ASNC/HFSA/HRS/SCAI/SCCT/SCMR/STS 2013 multimodality appropriate use criteria for the detection and risk assessment of stable ischemic heart disease: a report of the American College of Cardiology Foundation Appropriate Use Criteria Task Force, American Heart Association, American Society of Echocardiography, American Society of Nuclear Cardiology, Heart Failure Society of America, Heart Rhythm Society, Society for Cardiovascular Angiography and Interventions, Society of Cardiovascular Computed Tomography, Society for Cardiovascular Magnetic Resonance, and Society of Thoracic Surgeons. J Am Coll Cardiol. 2014; 63(4):380–406. [PubMed: 24355759]
3. Fleisher LA, Fleischmann KE, Auerbach AD, et al. American College of Cardiology; American Heart Association. 2014 ACC/AHA guideline on perioperative cardiovascular evaluation and management of patients undergoing noncardiac surgery: a report of the American College of Cardiology/American Heart Association Task Force on practice guidelines. J Am Coll Cardiol. 2014; 64(22):e77–e137. [PubMed: 25091544]
4. Fihn SD, Gardin JM, Abrams J, et al. American College of Cardiology Foundation; American Heart Association Task Force on Practice Guidelines; American College of Physicians; American Association for Thoracic Surgery; Preventive Cardiovascular Nurses Association; Society for Cardiovascular Angiography and Interventions; Society of Thoracic Surgeons. 2012 ACCF/AHA/ACP/AATS/PCNA/SCAI/STS Guideline for the diagnosis and management of patients with stable ischemic heart disease: a report of the American College of Cardiology Foundation/American Heart Association Task Force on Practice Guidelines, and the American College of Physicians, American Association for Thoracic Surgery, Preventive Cardiovascular Nurses Association, Society for Cardiovascular Angiography and Interventions, and Society of Thoracic Surgeons. J Am Coll Cardiol. 2012; 60(24):e44–e164. [PubMed: 23182125]
5. Lin GA, Dudley RA. Fighting the “oculostenotic reflex”. JAMA Intern Med. 2014; 174(10):1621–1622. [PubMed: 25156005]