

The Cost of SFA Interventions

How do factors such as in-stent restenosis impact the cost-effectiveness of angioplasty and stenting?

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Lower-extremity occlusive disease can be severely debilitating. Traditionally, open bypass has been the gold standard for restoring circulation, but endovascular techniques have recently offered additional options (eg, angioplasty, laser atherectomy, and stenting). Results from angioplasty alone in superficial femoral artery (SFA) disease have been less than satisfactory.¹⁻³ Angioplasty has been particularly limited for long-segment lesions and occlusions, and stenting has been seen as an answer to the high restenosis rates after suboptimal angioplasty. However, the best means by which to achieve favorable results in the SFA remains uncertain. Some studies report primary patency rates at 1 year to be as low as 29%.⁴ Better patency rates have been reported with the increased availability of long, self-expanding stents with significant radial strength. In 2001, Cheng et al reported primary patency rates at 1 year after SFA stenting to be 62.6%.⁵ Additionally, nitinol stents offer a constant radial force on the artery wall and plaque; they are also flexible and crush recoverable. Primary patency rates for nitinol stents are reported in the 80% range.⁶⁻⁸

One of the drawbacks of stenting is in-stent restenosis, which is believed to be caused by neointimal hyperplasia. PTFE-covered stents offer a potential way to decrease neointimal hyperplasia.⁹ Follow-up results at 6 months show primary patency rates of close to 80%.⁹ Drug-eluting stents are also a possible solution for neointimal hyperplasia.

THE RELATIVITY OF COST-EFFECTIVENESS

Endovascular techniques offer the potential for

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decreased operative mortality, shorter hospital stays, and fewer wound complications. These advantages can translate into increased cost-effectiveness if patency rates equal those of a vein bypass. The need for repeat procedures, however, regardless of their duration, can be the albatross of endovascular techniques. The initial benefits of lower cost as compared to open bypass can be offset by repeat procedures needed to maintain patency. One study estimates an open bypass to be twice the expense of an endovascular repair, but at 15 month follow-up, the cost per patient or cost per patent vessel is five times higher for an endovascular approach.¹⁰

SINGLE-CENTER AVERAGE COSTS

At our institution, the average physician charge for angioplasty is \$2,304, for atherectomy, the charge is \$3,028, and that for stent placement is \$3,113. The average cost for an overnight hospital stay if there are no complications averages \$8,245.66. The average physician charge for an open bypass is \$4,508, with a hospital stay costing \$26,117.80. Indeed, stenting and angioplasty offer decreased lengths of stay in the hospital with initial hospital stays that cost three times less. However, in cases of therapeutic failure, continuing to perform angioplasties diminishes the cost advantage. Not including the cost of

the initial angioplasty and stent placement, an occlusion that recurs three times costs approximately \$44,658.98. An *in situ* bypass would cost \$30,625.80. Additionally, some believe there is a 22% absolute risk reduction of occlusion for performing bypass instead of PTA.¹¹

ANALYSIS LIMITATIONS

The figures mentioned in this article are limited in that they only provide a glance at the fiscal aspects of endovascular versus open repair. Bypass surgery may also require reintervention, and that cost is not well documented here. A thorough study of patients that have undergone these different types of repairs is needed for an in-depth cost-benefit analysis. Factors such as complication rates or risk stratification were not explored for the sake of simplicity. The cost of subsequent surveillance studies was also not included. We feel that further evaluation of the cost of interventions will be crucial as to determine when an endovascular approach is no longer cost-effective in the current health care economic environment. ■

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