Iliac Artery

Recent developments in technology have made primary stenting an attractive option.

BY GARY M. ANSEL, MD

When undertaking endovascular therapy for the patient with peripheral vascular disease, the operator must offer the patient the highest chance of procedural success at the lowest risk available. Success of the procedure, not cost, must be the ultimate physician goal. For patients with symptomatic iliac artery occlusive disease, this includes the primary use of endovascular stents. Iliac artery occlusive disease may be treated for a number of reasons, including relief of claudication, relief of limb-threatening ischemia, and maintaining vascular access for other vascular-based procedures such as intra-aortic balloon pump placement or cardiac catheterization. In a randomized surgery versus percutaneous intervention study (to treat patients with claudication), open surgery was found to have significantly more risk, with similar improvement in ankle-brachial index and 3-year success, as intervention.[1] With inherent mortality and significant morbidity, open surgical bypass appears to be relegated to a secondary role for treating patients without an endovascular option.

ANGIOPLASTY ALONE

Initially, percutaneous transluminal angioplasty (PTA) was utilized for focal iliac artery stenoses with acceptable success rates. Graor et al,[2] in a meta-analysis of more than 1,300 patients showed early success rates of >90%, and 2- and 5-year patency of >70%. The definitions of success were not well defined, however, and treatment of complex disease was rarely attempted. Complications associated with PTA include vessel dissection, abrupt closure, spasm, and thrombus formation. Studies evaluating the use of PTA for total iliac artery occlusions generally showed significant embolization that led some to question the usefulness of PTA in this patient subset.[3-5]

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STENTING OPTIONS

The development and introduction of vascular stents revolutionized percutaneous treatment for symptomatic obstructive vascular disease. Since its introduction, the use of the Palmaz balloon-expandable stent (Cordis Endovascular, a Johnson & Johnson company, Miami, FL) for opening iliac artery stenoses has been associated with excellent hemodynamic and symptomatic improvement. Primary success was acceptable and secondary patency of >90% was seen.[6] As self-expanding, stainless-steel stents were introduced, more complex disease was able to be treated with similar rates of success.[7] Six-year primary patency in patients treated for claudication of nearly 80% has been seen in a more contemporary study utilizing the stainless-steel Wallstent (Boston Scientific Corporation, Natick, MA).[8]

Advanced engineering has led to the development of more flexible balloon-expandable stents and nitinol self-expanding stents with low profiles and minimal foreshortening. When utilizing endovascular stents for total iliac

namic parameters and Rutherford class. Richter et al[10] have shown increasing superiority of stents compared to balloon angioplasty over time. With more than 4-year follow-up, only 67% of the PTA group showed clinical improvement (≥ 1 Fountaine class), whereas approximately 90% of the stent group was improved. The Dutch iliac artery stent study,[11] which evaluated direct stent versus primary angioplasty (provisional stenting) did not find significant difference between the direct stent approach compared to provisional stenting for suboptimal angioplasty. However, nearly half (43%) of the patients randomized to balloon angioplasty necessitated stent placement for a suboptimal result during the primary procedure. Complication rates were almost doubled (4% vs 7%) in the angioplasty group. Due to low numbers, however, this did not reach statistical significance.

Interpretation of these study results is difficult because of a mean follow-up of <1 year and low acute technical success rates (approximately 80% for both groups). A later report with 5-year follow-up of this study did not find any significant difference between the groups, although repeat intervention was more common in the angioplasty group.[12] A meta-analysis of 1,300 patients compared iliac angioplasty and stenting and found significantly higher acute technical success, as well as improved 4-year primary patency in both claudicants and limb-threatening ischemia.[13] Iliac stents have even shown good results in aortic bifurcation disease, which can be very problematic for balloon angioplasty. In a study by Haulon et al,[14] 3-year primary and secondary patency were 78% and 98%, respectively.

As previously discussed, >40% of balloon angioplasty procedures for focal disease will be associated with significant residual physiologically important stenosis. As in any medical procedure, the physician operator must offer the patient the safest, most effective treatment. A primary stent philosophy offers many benefits, such as improved technical success, the ability to treat complex disease, and lower radiation exposure and contrast usage. Complications from dissection, acute vessel closure, and distal embolization are significantly decreased and long-term restenosis rates appear to be significantly improved. With a failure rate approaching 50%, the only possible reason to not utilize a stent is the associated upfront cost. However, as the stent market has expanded, prices have bypass, but we should strive for similar primary patency rates. Diffuse disease, smaller-diameter iliac arteries, and external iliac involvement all appear to adversely affect long-term patency. The development of self-expanding polyethylene terephthatate and polytetrafluoroethylene-covered stents has shown a trend in decreasing the need for repeat procedures in the iliac artery.[14] However, as in surgical bypass, minimal luminal diameter will affect patency of these stents and the addition of balloon-expandable polytetrafluoroethylene-covered stents that may maintain a larger luminal diameter should be studied because theoretically this attribute will be beneficial. The final issue will be whether treating the entire diseased vascular segment will increase long-term patency by decreasing advancement of disease. ■

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