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Case Reports

Management of Recurrent Iliac Artery Stenosis in Individuals Aged 55 or Less

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Aortoiliac disease is the most common location for symptomatic peripheral arterial disease in young patients. Angioplasty with stenting has become the initial treatment of choice for most patients. However, the treatment of recurrence is poorly studied, particularly in those who are considered candidates for surgical bypass. We reviewed our experience in 64 patients (91 limbs), mean age 48 years, who were treated with angioplasty (3%), repeat stenting (91%), or bypass (5%) for recurrent symptoms. These patients had TASC II A/B lesions predominantly of the common iliac arteries (78%). Time to retreatment was 13.6 months after the initial procedure mainly for claudication (mean ankle-brachial index 0.64). Primary, primary-assisted, and secondary patency rates for angioplasty were 85 ± 9%, 93 ± 7%, 100% after angioplasty; 76 ± 6%, 94 ± 3%, 96 ± 3% after stenting; and 86 ± 9% after bypass surgery at 12 months. Amputation-free survival rates were not statistically different out to 4 years. In conclusion, endovascular reintervention and bypass surgery demonstrate similar outcomes in patients with recurrent symptoms after failed angioplasty with stenting.

INTRODUCTION

Endovascular therapy has become the initial treatment strategy for patients with iliac artery peripheral arterial disease (PAD) that fails conservative management. Although initially limited to less-complex pathology such as TASC A/B disease, endovascular interventions are now routinely used for more severe disease.[1–4] Primary stenting of common iliac artery and external iliac artery stenoses or occlusions results in high technical success rates with similar favorable profiles for primary patency and complications. Restenosis occurs but overall rates for primary-assisted patency and secondary patency are also reported as ≥85%.[5]

In our experience, an exception to the excellent durability usually noted with iliac artery intervention occurs in younger individuals with accelerated PAD. Endovascular treatment often requires reintervention for either claudication or chronic limb ischemia. Younger patients also have been reported to have poorer outcomes with aortobifemoral bypass compared with those aged ≥60 years.[6] This has been presumed related to severity of aortic disease, smaller aortoiliac size, and more progressive infrainguinal disease. In this subset of patients, recurrent disease may beget recurrent disease with need for reintervention several years later. Because it is unclear how to address recurrent disease in this population, we proposed a retrospective analysis to understand how our institution has identified, treated, and retreated these patients. We compared endovascular interventions used to achieve primary-assisted patency or secondary patency including repeat angioplasty or deployment of a new stent. These patients were also compared with those undergoing open surgical bypass. Patients undergoing observation coupled with medical management were not included in the analysis.

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METHODS

We performed a retrospective review of outcomes in patients aged ≤55 years who had undergone a primary endovascular treatment of aortoiliac PAD within our tertiary institution. Department of Vascular Surgery, Greenville Health System, has maintained a prospective registry of all cases performed (~2500 lower extremity revascularizations) since 1992. A subset of patients with lower extremity PAD has been actively followed with Institutional Review Committee approval. Cases were selected for review if they underwent primary endovascular intervention for common iliac artery or external iliac artery PAD (stenosis or occlusion) between January 1, 2000 and December 31, 2011 and were aged ≤55 years. Patients were defined as having claudication with abnormal ankle: brachial indices (<0.90), resolution of lower extremity muscle pain within minutes of walking cessation, and culprit disease in either the common or external iliac arteries. Critical limb ischemia was defined as aortoiliac disease with ankle pressure <50 mm Hg or toe pressure <30 mm Hg in the Rutherford 4/Fontaine III category or ankle pressure <70 mm Hg or toe pressure <50 mm Hg in the Rutherford 5,6/Fontaine IV category. Restenosis was defined by presentation with clinical symptoms severe enough to warrant reintervention (claudication or chronic limb ischemia as evidenced by embolization, rest pain, or tissue loss) or a decrease in ankle-brachial index (ABI) of ≥0.15. A total of 64 patients with 91 interventions met the search criteria and were selected for analysis. This represents 12% of the total population of patients treated for aortoiliac PAD during that time frame.

Patients receiving a second procedure were grouped based on the type of reintervention they received: angioplasty alone, angioplasty with stent placement, or open bypass surgery. Patients were excluded from the surgical group for combined procedures such as femoral endarterectomy, profundaplasty, or distal revascularization.

Patient demographics, comorbidities, and smoking status were recorded. An independent variable analysis was performed regarding complexity of disease at the time of initial procedure, complexity of disease on recurrence, extent of ischemia, and smoking status. From the date of the intervention for restenosis, primary patency, primary-assisted patency, secondary patency, and amputation-free survival rates were obtained. These rates were compared among the various reinterventions. Duration of patency was determined by chart review of history and clinical exam, as well as by a decline in the follow-up ABI of ≥0.15 as determined by vascular studies generally performed at 1 month, 6 months, and then annually after the procedure. Death within 30 days of the secondary treatment was considered a treatment failure.

Statistical Analysis

Group comparisons were analyzed using Student's *t*-test for continuously distributed data and the Chi-squared test for categorical data. The Kaplan–Meier product limit method was used to estimate amputation-free survival time; the Log-rank test was used to assess the difference in patency and survival curves. Cox Proportional Hazards multivariate modeling was used to assess occurrence of restenosis. *P* values <0.05 were considered indicative of statistical significance. All analyses were conducted using SAS Statistical software (SAS Institute Inc., Version 9.1, Cary, NC).

RESULTS

Using iliac artery intervention and age of ≤55 years as criteria for selection, 64 patients were identified for study with procedures performed on 91 limbs (Table I). Average age was 48.7 years (±7.7 years) with equal distribution between men and women. Most lesions were TASC II A/B (n = 87), with only 4 TASC II C lesions. Notable demographic findings included a higher proportion of Caucasians and a 93.8% rate for tobacco use in the population studied. Type 2 diabetes was present in 26.6% of patients, and 35.9% of subjects had concomitant coronary artery disease. End-stage renal disease was present in only 2 patients.

Claudication was the primary presenting complaint with only a small proportion presenting with chronic limb ischemia as manifested by embolization, rest pain, or ischemic ulceration. Most cases had been previously treated with intervention at the common iliac artery only (85.7%, Table II). Although most patients had iliac artery restenosis, iliac artery occlusion was present in 18.7% of cases. Average baseline ABI was 0.64, and patients had been followed for a median duration of 13.6 months before developing restenosis. The intervention performed most commonly for the initial treatment of recurrent iliac artery disease was angioplasty with stent (91.2%). Angioplasty alone was only used in 3 patients (3.3%). Surgical bypass was used as the treatment strategy in 5 patients (5.5%).

Considering each leg as a separate case, characteristics are presented in Table III. Most legs received stent placement at the time of reintervention (55 of