SHORT REPORT

Combined Endovascular and Open Approach in Renal Salvage for Acute Renal Artery In-stent Thrombosis: The Danger of Undiagnosed Takayasu’s Disease

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Case Report

A 29-year female with a history of limited smoking (1 pk/week), hypercholesterolemia, and no personal or family history of an autoimmune disease was referred to an outside institution for reevaluation of persistent hypertension despite aggressive medical management. Her clinical symptoms and signs suggested renovascular hypertension. An initial angiogram revealed bilateral renal artery stenosis, which provided her with a presumed diagnosis of fibromuscular dysplasia. Bilateral renal artery angioplasties were performed with good technical results and with improved blood pressure control.

Eleven months following her procedure, a screening duplex ultrasound suggested restenosis of her renal vessels. She was referred to our institution and underwent repeat angioplasty. She received heparin during the procedure, and she was prescribed a course of clopidogrel and aspirin for 1-month and 2 months, respectively. Poor technical results were achieved, and bilateral renal stents were placed. Fifteen days following her procedure, she presented to the emergency room with acute onset abdominal pain that had started 10 h prior to her admission. Both a duplex ultrasound and an angiogram demonstrated complete occlusion of her right renal artery with an infarcted right kidney.

The left renal artery was patent. No additional intervention was performed as she settled on conservative treatment.

Four days later the patient returned to the emergency room with another episode of similar abdominal pain that had developed 4 h prior to her arrival; she was also oliguric. At this point she was referred to vascular surgery. An angiogram showed new occlusion of her left renal vessels. No distal vessels or nephrogram were visualized (Fig. 1). A thrombolysis infusion catheter passed easily, and she was immediately treated with tissue plasminogen activator (1 mg/h). Following 6 h of therapy, a repeat angiogram showed 60–70% restoration of parenchyma blood perfusion to her left kidney but significant residual clot within the stent. In an attempt to salvage the kidney, a left aorto-renal artery bypass with greater saphenous vein was performed immediately. A biopsy of the aorta and a subsequent MRA of her thoraco-abdominal aorta suggested Takayasu’s arteritis. The patient was commenced on immunosuppressive therapy.

Over the next 48 h she became anuric with a rise in creatinine (>8 mg/dl) and progressed to hemodialysis. A renal artery scan and duplex ultrasound three days following her surgery suggested an open graft that was adequately perfusion of the left kidney. A week following her surgery, she began to produce urine and over the next few months her renal function returned, and she was taken off of dialysis. Follow-up duplex ultrasounds and an angiogram (Fig. 2) continue to show a patent bypass graft; the patient remains dialysis free for 2 years.
Discussion

This case report is presented not only to discuss the appropriate therapy of Takayasu’s disease of the renal artery; but also to illustrate both the inherent consequences of endovascular stenting in renal artery occlusive disease, which is not due to atherosclerotic disease or fibromuscular dysplasia, and the successful salvage of a kidney using a combined endovascular and open approach. The therapeutic dilemma of restenosis or occlusion following endovascular intervention is of particular importance in patients with Takayasu’s arteritis due, in part, to three pathologic consequences of the disease: (1) all layers of the vessel (panarteritis) are inflamed which increases the resistance of the vessel as compared to the resistance of a vessel in a patient with atherosclerotic narrowing.1 (2) Patients oscillate between active and inactive phases of their disease; they have the potential to develop multiple lesions which often can be near the site of previous stenosis. (3) These patients are hypercoagulable in both the active and inactive phases which renders them more vulnerable to thrombus formation.2 In this patient, restenosis of the renal arteries was most probably due to uncontrolled, active vasculitis of her undiagnosed Takayasu’s disease.

The two most serious potential consequences of renal artery stenosis are hypertension and loss of kidney(s). Despite its well-known ability to induce morbidity, hypertension portends an especially poor prognosis in patients with Takayasu’s disease for it correlates with higher rates in mortality, stroke, myocardial injury and renal failure.3 There are a few case series that describe surgical repair for Takayasu patients with hypertension or threatened renal infarction due to renal artery stenosis. Despite the success described by the authors in these studies, there was a fairly high rate of occlusion, 20–25% of these patients required repeat intervention, and pseudoaneurysm formation.4–6 Unfortunately, there is no test or confluence of tests that can predict the success of renovascular reconstruction.5 Surgery, in most instances, should be offered to patients with symptoms/signs of renal artery stenosis secondary to Takayasu’s disease who have failed medical and endovascular attempts at correction, who have complete occlusion of the artery, or who have involvement of a long vessel segment.7

Studies already support the use of angioplasty with or without stenting for Takayasu patients with narrowing of their aorta or subclavian artery, as examples.1,8 As a result, a less invasive therapeutic approach, balloon angioplasty has burgeoned into a respectable treatment option in these patients. Angioplasty has been technically and clinically successful in 85–95% of adult and pediatric patients with a low complication risk. Despite the intervention’s immediate success, restenosis is appreciable at approximately 14–21%, and is highest in patients with concomitant aortic disease, a proximal stenosis, a relatively long lesion, or clinically active disease.6,9–12

Acute occlusion of a previously treated renal vessel, as in this case, can lead to the loss of a kidney if not reversed quickly. Under these circumstances, angioplasty with or without stent placement is difficult. Surgical bypass or renal vessel reimplantation are traditional approaches that have been used, based upon a few reports in the literature, to salvage a threatened kidney.13,14 In recent years, however, thrombolysis has gained significant favor. A few reports relay the success of thrombolytic therapy in cases of acute renal artery occlusion following failed endovascular intervention.9,14 Of note, complete

Fig. 1. Bilateral, proximal narrowing of the renal arteries as seen on an aortogram.

Fig. 2. Selective angiogram of the left renal aortorenal bypass graft.
occlusion of the renal artery does not necessarily imply irreversible renal ischemia for patients with chronic conditions that lead to occlusion as they often generate sufficient collaterals; however, in this case, abrupt occlusion requires emergent intervention to salvage a kidney.\textsuperscript{7,15}

Currently, there is no preferred invasive intervention for the treatment of renal artery stenosis due to Takayasu’s disease. This case suggests that failure to identify and adequately, medically treat the underlying vasculitis contributes to restenosis of the treated lesion; thus, in this patient, recognizing the underlying disease may have prevented frequent reintervention and improved outcome. However, as this case describes, thrombolysis and/or surgery can potentially restore adequate renal perfusion for patients who subsequently develop acute occlusion.

References


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