Embolization and Angioplasty to Relieve Malignant Hypertension and Azotemia in a Renal Transplant Patient

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Abstract. The case of a 23-year-old patient with malignant hypertension following a renal transplant illustrates the successful treatment of the hypertension with embolization of the native kidneys. Azotemia followed and was successfully treated with percutaneous transluminal angioplasty of high-grade stenosis at the anastomotic site of the allograft. Malignant hypertension redeveloped with the recanalization of the embolized native kidneys. This was successfully treated with contrast ablation.

Key words: Angioplasty, percutaneous transluminal — Embolization, therapeutic — Hypertension — Azotemia — Renal transplant — Contrast ablation

Multiple uses of percutaneous transluminal angioplasty (PTA) and embolization have been reported in recent years. Only a few cases, however, have been described where both these approaches were used in the same patient for therapy [1]. This is a report on a renal transplant patient who was successfully treated with embolization of the native kidneys for uncontrollable hypertension and angioplasty of an allograft anastomotic stenosis for renal failure.

Case Report

A 23-year-old woman who had a renal allograft following renal failure, a complication of systemic lupus erythematosus, was admitted to the hospital on August 8, 1979, with uncontrolled hypertension. Her medical regimen included Inderal, 120 mg, q.i.d.; hydrochlorothiazide, 100 mg, q.i.d.; minoxidil, 100 mg, q.i.d.; Apresoline, 120 mg, q.i.d.; and a 2 g sodium diet. Renin levels from both native kidneys were elevated with 15.3 ng/ml/h from the right kidney, 12.1 from the left kidney, 7.6 from the inferior vena cava, and 8.2 from the allograft. Each of the renin levels was elevated secondary to the effects of minoxidil; however, the ratio indicated significant output from both native kidneys.

A single right renal artery was embolized with a Gianturco coil. The three small renal arteries to the left kidney were embolized with Gelfoam following ablation of the kidney with contrast material (Figs. 1 and 2).

The patient’s blood pressure responded from 220/120 to 130/80 mm Hg within 6 hours. Medication was no longer needed for control of her hypertension. However, the patient developed azotemia with creatinine levels changing from normal to 5 mg/dl over 5 days period. Ultrasound failed to demonstrate any change in the appearance of the allograft. An isotope scan demonstrated some decrease in perfusion to the allograft. Arteriography demonstrated high-grade stenosis at the anastomotic site of the allograft (Fig. 3). A Grüntzig catheter was used to distend the anastomotic stenosis (Fig. 4). Her creatinine levels returned to normal within 5 days.

In January, 1980, the patient was treated for transplant rejection. In February, 1980, the patient returned with a serum creatinine level of 5.1 mg/dl and recurrent hypertension. Arteriography demonstrated recanalization through the Gianturco coil to the right kidney and through the lower lobe branch to the left kidney, which had been embolized with Gelfoam (Figs. 5 and 6). Repeat renin levels demonstrated 6.6 ng/ml/h from the right renal vein, 2.7 from the left kidney, 2.4 from the transplant kidney and inferior vena cava. A repeat arteriogram of the allograft demonstrated moderate recurrent stenosis. Angioplasty was repeated and the gradient at the stenosis was reduced to zero. Creatinine level had dropped to 2.4 mg/dl.

On a subsequent admission, the patient’s right native kidney was ablated with contrast material through the recanalized Gianturco coil.

Results

In August, 1980, and April, 1981, repeat arteriograms demonstrated a normal anastomosis without a pressure gradient (Fig. 7). Despite multiple acute allograft rejections during this interval, the patient’s hypertension continued to be controlled.
Fig. 1. Ablation of the lower pole and two branches of the left kidney with contrast Gelfoam emboli.

Fig. 2. Coil spring obliterates the proximal right renal artery.

Fig. 3. Renal allograft stenosis.