Percutaneous Transluminal Recanalization of Common Iliac Artery Occlusions

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Abstract. Percutaneous transluminal recanalization of occluded iliac arteries was attempted in 25 patients (26 limbs). In 22, successful recanalization was achieved, although 4 patients required additional surgical thrombectomy. The remaining 4 patients had surgical bypass procedures. The early and late results of percutaneous recanalization are presented as well as the technique used. We conclude that percutaneous recanalization of iliac occlusion is an effective procedure in the majority of cases. The option of surgical treatment remains viable when the percutaneous approach is unsuccessful.

Key words: Percutaneous recanalization—Iliac artery—Arterial occlusion

The results of percutaneous transluminal angioplasty (PTA) of localized stenoses of the iliac artery have been shown to be comparable to those obtained surgically. This procedure has now been generally accepted as the initial method of treatment in most centers [1, 2]. Controversy exists, however, as to the role, if any, of percutaneous transluminal recanalization (PTR) in patients with occlusion of the iliac artery [3–6]. The purpose of this paper is to present our experience in PTR in 25 patients (26 treated limbs), with total occlusion of the iliac artery.

Patients and Materials

Twenty-five patients underwent 26 recanalization procedures with 1 of them having had bilateral occlusions. Their ages ranged from 18 to 80 years, with 11 of them being over 70 years of age. There were 20 male and 5 female patients, and 14 were smokers. Hypertension was present in 6 patients, diabetes in 7, ischemic heart disease in 8, and previous cerebrovascular accident in 4. All except 2 patients were initially examined by translumbar arteriography, with the recanalization procedure performed a few days later. The 2 patients with acute onset of symptoms were initially studied by Seldinger arterial catheterization, as thrombolytic treatment was contemplated.

Of the 25 patients studied, 23 had unilateral segmental occlusion of the common iliac artery, beginning at or near the aortic bifurcation and extending distally for 3–6 cm. One patient had short bilateral common iliac occlusions, and the other had a 10-cm occlusion involving the common iliac artery and partially extending into the proximal part of the external iliac artery. Runoff into a patent external iliac and common femoral artery was present in all instances. Occlusion of the superficial femoral artery was present bilaterally in 7 patients and unilaterally in 6. Mild to moderate atheromatous changes were noted in the superficial femoral arteries in the remaining 12 patients.

Technique of Percutaneous Recanalization

Catheter and balloon recanalization was attempted in 23 patients. In the other 2, with acute symptoms, intraarterial thrombolytic treatment with streptokinase was instituted followed by angioplasty after clot lysis was obtained. The ipsilateral femoral artery was punctured in 22 of them, with the axillary approach being used in 1 patient. Pressure measurements in the external iliac artery were recorded. A straight or 15-mm J guide wire was then maneuvered through the occluded segment. When the guide wire was seen to enter the distal aorta, an end-hole 6.3F straight catheter was passed over it into the aorta.

After recording the aortic pressure, a heavy-duty guide was introduced, and the straight catheter was exchanged for a balloon catheter. The balloon size most frequently used was 4 cm long and 8 mm in diameter. Multiple balloon inflations under fluoroscopic control were made, and, when a femoral pulse became palpable, angiography was performed. Before terminating the procedure, pressure measurements above and below the previously obstructed segment were recorded. In patients in whom the guide wire did not readily pass into the aorta, the procedure was terminated.

Two additional patients who presented with acute symptoms underwent angiography by the Seldinger technique, one via the axillary and the other via the contralateral femoral artery. Immediate intraarterial thrombolytic therapy was instituted with the catheter tip embedded in the occluded segment. Streptokinase was infused at the rate of 5,000 U/h, and IV heparin was
started. Progress was assessed angiographically, and after clot lysis the infusion catheter was exchanged for a balloon catheter and the underlying stenotic segment was dilated.

All patients received dipyridamole 25–50 mg t.i.d. and acetylsalicylic acid 500 mg daily, starting the day before the recanalization procedure and continuing indefinitely afterward. Heparin 5,000 U was administered intraarterially when the occlusion was traversed.

Late follow-up was by means of clinical examination, pulse volume recording, and Doppler ultrasonography. The most important aspect of the clinical examination was the presence and strength of the femoral pulse.

Results

Successful immediate recanalization was achieved in 16 of the 24 limbs with complete disappearance of the pressure gradient in 10, and in 6 a residual gradient of 10–40 mm Hg remained (Figs. 1, 2). In 2 other patients, successful PTA was performed after clot lysis revealed an underlying stenotic segment. In these 18 patients, angiography showed the patency with varying degrees of intimal irregularity of the recanalized segment (Fig. 3). Femoral pulses were palpable as soon as recanalization was achieved.

In an additional 4 patients, recanalization was achieved, but varying degrees of residual thrombus were noted angiographically at the end of the procedure, and pressure gradients above 50 mm Hg remained. All patients had immediate surgical thrombectomy via the ipsilateral femoral artery under local anesthesia with a good result in all. Thus, in 22 of the 26 attempts, recanalization was achieved, although 4 of them did require an additional relatively minor surgical procedure.

The occluded segment could not be traversed by the guide wire in 3 patients. In the last patient the guidewire passed through the occlusion, but despite this the catheter would not traverse the occlusion. These 4 patients had elective bypass surgery. Distal emboli were not seen in any instance, neither in the ipsilateral nor the contralateral leg. Localized hematoma formation at the puncture site occurred in 2 patients.

The 22 procedures (in 21 patients) included for late follow-up are the 16 primary recanalized by balloon dilatation, 4 who had balloon recanalization followed by surgical thrombectomy, and 2 patients who had initial thrombolytic therapy followed by