Cross-over Graft for Unilateral Occlusive Disease of the Iliofemoral Arteries *

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The usual method for treating patients with unilateral occlusive disease of the iliofemoral arteries requires a by-pass of the occluded segment with a graft from the abdominal aorta to the popliteal artery. This operative procedure often is too extensive for many poor-risk patients with this disease. It has been found technically feasible in these poor-risk patients to attach the upper anastomosis to the opposite external iliac artery instead of the abdominal aorta and accomplish the same results with less surgical trauma. This procedure has been employed in two patients and a brief clinical summary of the first patient follows.

History: S. R., a 55-year-old colored man, was admitted to the Veterans Administration Medical Teaching Group Hospital, Memphis, Tennessee, November 12, 1958, with a chief complaint of pain at rest in his right foot of one week's duration. Past history revealed that the patient has been suffering from intermittent claudication for 13 years, for which bilateral sympathectomies were performed in 1954. Six months previous to this admission, a by-pass arterial graft was placed in the right leg from the common femoral artery to the proximal popliteal artery. A similar procedure was carried out on the left leg with the exception that the lower end of the graft was anastomosed to the anterior tibial artery in the anterior compartment of the calf. The patient was discharged with both grafts functioning satisfactorily and without limitation of walking. Physical examination revealed an absence of all pulses in the right leg with an ischemic ulcer on the right heel. The arterial graft in the left leg was functioning satisfactorily.

Hospital Course: On admission, the right femoral by-pass graft was found to be occluded and, with the absence of a right femoral pulse, it seemed probable that the right iliac artery had become occluded which in turn caused thrombosis of the graft. The ischemic ulcer and rest pain in the right foot were sufficient to indicate early amputation of the right leg if grafting could not be satisfactorily accomplished. The patient was scheduled for operation to attempt restoration of arterial blood flow by an aortic popliteal by-pass graft. At operation, the right common femoral artery was exposed and the expected occlusion was found, but the profunda femoral artery was patent. The right popliteal artery was visualized by injecting radiopaque dye into the profunda femoral artery. The arteriogram revealed a two-inch segment of the midpopliteal artery to be patent with a poor popliteal artery outflow tract (Fig. 1). Implantation of an arterial graft into this popliteal segment appeared to have a poor chance of success. Inasmuch as the iliac artery was occluded above, the site of the upper anastomosis would have to be at the level of the abdominal aorta. This seemed to be an extensive operative procedure considering the limited chance of success. When the decision had been made to abandon the procedure and to amputate the leg, one of us (S. F. K.) suggested placing the upper anastomosis to the opposite external iliac artery which was known to be patent since the left femoral artery was forcibly pulsating. A left McBurney incision was now made and the left external iliac artery exposed extraperitoneally. Adequate exposure was obtained for the performance of an end-to-side anastomosis with a dacron prosthesis.* With the aid of a small incision in the right lower quadrant, the graft was tunneled extraperitoneally in a plane superior to the bladder, thence through the femoral canal to the anterior thigh incision and then beneath the fascia to an incision in the lower right medial thigh. The right popliteal artery was exposed through this lower incision. An end-to-side anastomosis was performed between the graft and the patent segment of the popliteal artery. A third

* Submitted for publication April 15, 1959.

* Manufactured by George P. Pilling & Son Company, Philadelphia, Pennsylvania.

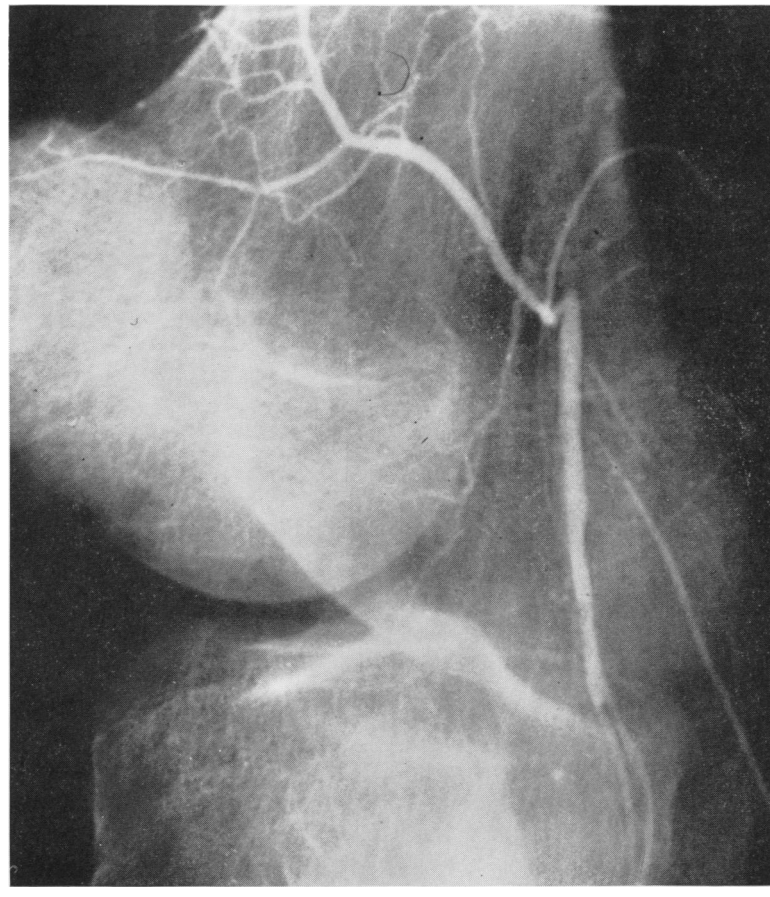

FIG. 1. (Patient S. R.). Arteriogram reveals patency of the middle one-third of the right popliteal artery with a poor outflow tract.

anastomosis was performed between the proximal end of the profunda femoral artery and the side of the graft (Fig. 2). Postoperative course was uneventful with return of pedal pulses and prompt healing of the ischemic ulcer.

Discussion

A similar cross-grafting procedure was used in a second patient with equally good results. The popliteal outflow tract in this patient was good, but his fragile general condition would not permit the extensive procedure necessary to place the graft from the abdominal aorta to the popliteal artery. Therefore, the cross-over graft from the popliteal artery to the contralateral external iliac artery was used. The end-to-side anastomosis between the profunda femoral artery and the graft was not performed in this second case because of a better popliteal outflow tract.

Patients with both iliac and femoral arterial occlusions in one leg but with good pulses in the other leg are common. This combination of iliac and femoral arterial occlusions usually causes severe ischemic symptoms, often terminating in amputation of the leg. By the same reasoning, it can be assumed that the popliteal artery is usually patent in these patients because, if occluded along with the occlusions of the iliac and femoral arteries, extensive and hopeless gangrene will be present. Previously, we have performed 11 bypass arterial grafts from the abdominal aorta to the popliteal artery with good results, but this is an ex-

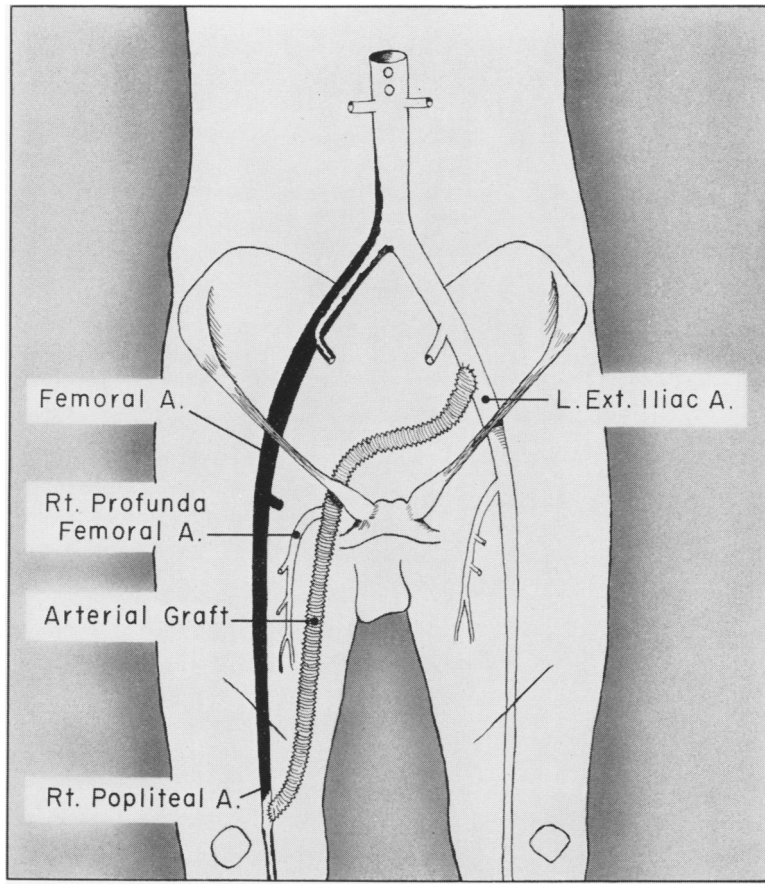

FIG. 2. (Patient S. R.). A schematic presentation of an arterial graft from the right popliteal artery to the contralateral external iliac artery. The right iliofemoral occlusive arterial disease is represented in black.

tensive operation which cannot be tolerated by the poor-risk patient. If the opposite iliac artery is patent, the cross-over graft will accomplish the same result as the aortic popliteal graft but with much less surgical trauma. The procedure is no more traumatic than the midthigh amputation that would have been necessary in these two cases if no satisfactory grafting procedure could safely be used. Follow-up examinations on these two patients at three and four months revealed excellent function of the grafts.

Summary

Two patients with unilateral iliofemoral arterial occlusive disease have been satisfactorily treated with a by-pass arterial graft from the popliteal artery of the diseased leg to the external iliac artery of the opposite leg.

This procedure is less traumatic than the usual aortic popliteal graft performed in this type of case and should prove to be a leg-saving operation when the patient's condition will not permit the more extensive operation.