 Internal iliac artery revascularization for limb salvage purposes

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Lower extremity revascularization is routinely performed for limb salvage purposes when critical limb ischemia has developed in a patient. Traditional reconstructions have been well described in the literature. We present a case of internal iliac artery endarterectomy with aortointernal iliac bypass for the treatment of limb ischemia. (J Vasc Surg 2007;45:607-9.)

Internal iliac artery revascularization has been well reported in the literature. The indications for the revascularization are usually for the treatment of vasculogenic impotence,1 gluteal claudication,2 and patients with bilateral iliac artery aneurysms who undergo endovascular aneurysm repair.3 We report a patient who underwent internal iliac artery endarterectomy and aortointernal iliac bypass with a prosthetic graft for limb-threatening ischemia.

CASE REPORT

In August 1991, a 60-year-old woman with a 40-year pack-history of smoking, hypertension, and hypercholesterolemia presented with bilateral lower extremity ischemia. Her ankle-brachial index (ABI) was 0.18 on the right and 0.24 on the left. An arteriogram revealed severe bilateral common iliac artery stenosis with thrombosed right femoral arteries with reconstitution of the above knee popliteal artery with three-vessel run off.

She underwent bilateral iliac artery balloon angioplasty and thrombolysis of the right femoral arteries, with angioplasty of the origin of profunda femoris and mid superficial femoral arteries. Her symptoms greatly improved to an ABI of 0.55 on the right and 0.44 on the left. The patient quit smoking and was placed on aspirin therapy.

A year later, she presented with ischemic rest pain of the right lower extremity (ABI right, 0.25; left, 0.52). She underwent an aortobifemoral bypass with an end-to-end proximal anastomosis, and a 6-mm polytetrafluoroethylene (PTFE) graft was used to create a bypass from the right femoral to the above knee popliteal artery. The prosthetic femoropopliteal graft failed in 6 months. Thrombolysis was not successful. An open thrombectomy with an occluded native iliac system as well as proximal internal iliac arteries (Fig 1, A), with patent internal pudendal and superior gluteal branches of the internal iliac artery receiving collateral flow from the left iliac and femoral arteries (Fig 1, B). Thrombolysis could not be performed successfully.

For limb threatening ischemia, she underwent thrombectomy of the right limb of the aortobifemoral graft, with extensive endarterectomy of the internal iliac artery to the level of the superior gluteal and internal pudendal arteries. Owing to lack of an appropriate autogenous conduit, a 6-mm externally supported carbon-coated PTFE graft was used to bypass between the old right limb of aortofemoral graft and the internal iliac artery. She was relieved of ischemic rest pain, her leg ulcer healed, and her ABIs significantly improved to 0.68 on the right and 0.78 on the left. A follow-up arteriogram revealed a patent aortoiliac graft with good visualization of collaterals in the thigh and visualization of distal popliteal artery with a three-vessel run off (Fig 2).

More than a year later, she presented with new onset ischemia and right leg pain at rest. An arteriogram showed a thrombosed aortoiliac graft. Thrombolysis could not be performed successfully, and she underwent right above knee amputation.

DISCUSSION

The importance of internal iliac artery revascularization to prevent pelvic ischemia has been extensively reported in the literature; however, internal iliac artery revasculariza-
tion for the treatment of lower extremity ischemia has not been well documented.

There is an extensive collateralization between the pelvic circulation and the lower extremities. This network is usually through branches of the internal iliac artery (superior and inferior gluteal, obturator and internal pudendal arteries), branches of the external iliac artery (circumflex artery), and branches of the common femoral artery and deep femoral arteries (medial and lateral circumflex arteries). This extensive network of collaterals becomes more important when chronic occlusion of the iliofemoral system occurs. The internal iliac artery thus has the very important role of linking the pelvic circulation, which is supplied by both internal iliac arteries and the aorta, to the distal aspect of lower extremity via the branches of profunda femoris, which interconnects with superior, inferior, lateral and medial geniculate arteries to provide a blood supply to the distal popliteal and tibial vessels.

The provision of blood from the aorta or the contralateral femoral artery to the profunda femoris artery usually results in reasonable perfusion to the lower extremity and eliminates acute ischemia. In this patient, because of multiple previous procedures that had been performed in the groin, all of the proximal major branches of the profunda femoris had been occluded. The main body of the internal iliac artery was also occluded; therefore, the two main branches of internal iliac artery (internal pudendal artery and superior gluteal artery) were the main blood supply to the lower extremity. By performing extensive endarterectomy of the internal iliac artery down to the main branches and providing inline flow from aortic graft, we were able to provide reasonable perfusion to eliminate the ischemia and heal the ulcer.

The exposure and endarterectomy of the internal iliac artery is principally similar to that of the profunda femoris. The main differences are the exposure and the more extensive venous plexus crossing the arterial branches. The patient’s symptoms were relieved for more than a year, until thrombosis of graft occurred. The internal iliac artery had abundant collaterals and was able to support the graft.

A case of internal iliac artery revascularization from the contralateral iliac artery has been reported by Filho et al for ischemic rest pain; however, no endarterectomy of the internal iliac artery was required. To the best of our knowledge, this is the first case in the English literature of internal iliac artery endarterectomy combined with an aortointernal iliac artery bypass for the treatment of ischemic ulcer and rest pain.

CONCLUSION

This case demonstrates that revascularization of a lower extremity is possible through the internal iliac artery and its collateral circulation when other standard revascularization methods have failed and are no longer available; however, the long-term patency is not well established.
REFERENCES


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