Aortoiliac endarterectomy as a viable alternative for revascularization in a woman with isolated aortoiliac disease and an anomalous right pelvic kidney

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ABSTRACT

Although the use of aortoiliac endarterectomy to treat occlusive disease has declined since the advent of endovascular procedures and operative bypass grafting techniques, clinical scenarios still exist in which it can be useful. We present the case of a patient with right lower extremity pain at rest, an anomalous right pelvic kidney, right common iliac artery occlusion, and severe left common iliac artery stenosis. We have demonstrated that aortoiliac endarterectomy should not be considered an outdated surgical technique but a viable alternative for revascularization in a specific subset of patients. (J Vasc Surg Cases and Innovative Techniques 2021;7:277-9.)

Keywords: Aberrant renal artery; Aortoiliac endarterectomy; Aortoiliac occlusive disease; Pelvic kidney

Aortoiliac occlusive disease (AIOD) results from the progressive atherosclerotic changes occurring within the aortic bifurcation that can extend both proximally and distally. AIOD can cause a range of symptoms, including claudication in the thighs and buttock, reduced femoral pulses, and impotence. With the advent of aortobifemoral bypass (ABFB) and percutaneous techniques, the use of aortoiliac endarterectomy (AIE) to treat AIOD has declined.1 In the present report, we have described the case of a patient with right lower extremity pain at rest, an anomalous right pelvic kidney, and severe left common iliac artery (LCIA) stenosis. We have demonstrated that aortoiliac endarterectomy should not be considered an outdated surgical technique but a viable alternative for revascularization in a specific subset of patients.

CASE REPORT

Our patient was a 54-year-old woman who had presented to the emergency department with a history of right foot pain at rest of 1 month’s duration. She also reported a history of left calf claudication that had been present for several years.

On physical examination, the patient had absent right femoral, popliteal, posterior tibial, and dorsalis pedis pulses without tissue loss. The left lower extremity femoral, popliteal, posterior tibial, and dorsalis pedis pulses were weakly palpable with no ankle brachial index. The right ankle brachial index was 0.4 and 0.70, respectively. The patient had well-controlled hypertension with renal function that was within normal limits.

Three-dimensional reconstruction from a computed tomography angiogram illustrated occlusion of the RCIA at the origin, with reconstitution distally just proximal to the iliac bifurcation, an aberrant right pelvic kidney arising ~1 cm proximal to the aortic bifurcation, and high-grade LCIA stenosis (Fig 1). Angiography was performed with the intention to treat and better characterize the patient’s anatomy. The angiogram illustrated a patent aorta, celiac artery, and superior mesenteric artery (Fig 2). The RCIA showed a densely calcified occlusion, and the lesion could not be crossed using endovascular techniques. Reconstitution of the right external iliac artery and hypogastric arteries was noted, with patent right common femoral, profunda, superficial femoral, and popliteal arteries. The LCIA had severe stenosis with patent distal arteries. The main renal artery originated from the distal aorta, and the right pelvic kidney was noted with no perfusion to the inferior pole of the kidney.

Given that the patient’s disease pattern was limited to the distal aorta and bilateral iliac arteries with an anomalous right pelvic kidney, AIE was performed. A midline laparotomy was performed, and the aorta was mobilized, with the inferior mesenteric artery (IMA), right pelvic kidney, and RCIA identified. The right renal vein was found to be draining into the left common iliac vein, and the main right renal artery was identified arising from the distal aorta. The right renal vein was looped and mobilized, allowing for proximal and distal sewing of the RCIA. An inferior pole right renal artery was found to arise from the occluded RCIA (Fig 3). The proximal aorta was clamped above the IMA, and the right hypogastric artery, right external iliac artery, and LCIA were each clamped. A longitudinal arteriotomy was created in the aorta from the level of the IMA onto the RCIA and terminated at the proximal right external iliac artery. A separate LCIA arteriotomy was created. Aortic endarterectomy was performed just inferior to the IMA with extension to the RCIA and termination in the proximal right external iliac artery.
A separate LCIA endarterectomy was performed. The aorta was closed primarily onto the mid-RCIA, the proximal clamp was then moved to this level, and flow was reperfused to the right kidney to decrease the right renal ischemic time. Orifical endarterectomy was performed of the inferior right renal pole artery arising from the RCIA. Endarterectomy of the distal RCIA and proximal REIA was completed with bovine pericardial patch angioplasty. The LCIA was closed separately with bovine patch angioplasty. After the procedure, the patient had palpable femoral and pedal pulses bilaterally. The patient had an uneventful postoperative course, with immediate resolution of her pain at rest, and she was discharged home on postoperative day 6. At 4 months postoperatively, the patient’s renal function was within normal limits, and she had continued to deny right foot pain at rest with palpable right pedal pulses and a right limb ankle brachial index of 1.2.

**DISCUSSION**

With the advent of endovascular techniques, the treatment of AIOD has shifted from operative surgical approaches such as ABFB and AIE to angioplasty and stenting. The continued innovations of vascular grafts has further limited the use of AIE compared with ABFB in the setting of AOID.

Although the use of AIE has decreased, it remains a viable option for a specific subset of patients. AIE will be most beneficial for patients with high-grade, focal lesions of the aortoiliac vessels, those who are not good candidates for ABFB because of small vessels or infection, and those whose disease has spared the external iliac arteries. Additionally, patients with small aortoiliac vessels, especially women, have been considered good candidates for AIE because smaller diameter prosthetic grafts might have a greater risk of thrombosis. In these subsets of patients, AIE allows for direct treatment of lesions without the introduction of prosthetic material.

For our patient, who had had relatively focal disease and an anomalous pelvic kidney, AIE had advantages compared with other surgical approaches and
endovascular techniques. In the present case, AIE allowed for maintenance of inline flow to the right renal artery. Endarterectomy is an excellent surgical option for patients with high-grade lesions in large-caliber vessels, especially in the proximal common iliac arteries, and results in high long-term patency rates, with good symptom resolution.5

The viable hybrid option of LCIA stenting with femoral-femoral bypass appeared less appealing for our young patient who was a good surgical candidate. Traditional ABFB would have required proximal end-to-side anastomosis or separate bypasses to multiple right renal arteries to maintain right renal perfusion.

Although patient selection for AIE is multifactorial, several studies have illustrated the efficacy of the operative procedure.6-8 In an 11-year retrospective cohort study of patients who had undergone AIE, Naylor et al9 found 0% mortality at 30 days, with 92% patency at 5 years. Similarly, in a retrospective review of patients who had undergone AIE, Pretre et al10 reported no postoperative deaths and 90% patency at 5 years. Durable results such as these can only be maintained if care is taken in selecting the ideal anatomic candidates. Extension of the atherosclerotic plaque into the external iliac arteries is a relative contraindication owing to the difficulty in obtaining a proper distal endpoint. The findings from the present case report add to the increasing data that AIE should not be considered a lost art but remains a valuable operative alternative for a subset of patients, offering low mortality and high patency rates.

CONCLUSION

AIE should be considered a viable option that offers excellent long-term results for patients with aortoiliac disease not amenable to endovascular intervention, in particular, young female patients with small vessels.

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