Congenital anomaly of the external iliac artery: A case report

Teruyuki Koyama, MD, PhD, a Tadanori Kawada, MD, b Yosuke Kitanaka, MD, a Katsutoshi Katagiri, MD, PhD, a Makoto Ohno, MD, a Masatoshi Ikeshita, MD, a and Noboru Yamate, MD, a Kawasaki, Japan

A 51-year-old man was admitted with acute ischemic pain in the left leg. An angiogram demonstrated a well-developed left internal iliac artery that appeared to be continuous with the left common femoral artery, but no left external iliac artery. The left superficial and proximal deep femoral arteries were obstructed with thrombi. At surgery it was revealed that the distal end of the left common iliac artery was continuous with the dilated left internal iliac artery, forming the continuation with the left common femoral artery in the pelvic cavity. The left external iliac artery was absent between the common iliac and femoral arteries. (J Vasc Surg 2003;37:683-5.)

Congenital anomalies of the iliac and femoral arteries are rare and usually discovered incidentally at autopsy or suggested by chronic ischemia of the lower limbs. Most reported cases have been iliofemoral aplasia associated with persistent sciatric artery or atresia with residual cord.1-5 Isolated agenesis of the external iliac artery is extremely rare. We treated a patient with isolated absence of the left external iliac artery and anomalous course of the internal iliac artery, manifested by acute ischemia of the leg due to thrombosis of the femoropopliteal system.

CASE REPORT

A 51-year-old man was admitted to the hospital because of worsening ischemia of the left lower limb. Mild intermittent claudication of the left leg had been present for 6 months, but suddenly, 4 days before admission, the patient could not walk for more than 10 minutes because of calf pain. He had undergone inferior vena cava filter insertion at the age of 48 years because of venous thrombosis of the left leg.

The left lower leg was cold and cyanotic, and arterial pulse in the left femoral artery was not palpable. Blood flow in the left femoral artery and popliteal artery was detected with Doppler ultrasound scanning. There was no evidence of hypercoagulability, hyperlipidemia, or hepatorenal dysfunction. A computed tomographic (CT) scan demonstrated mural thrombi in the infrarenal abdominal aorta. Although the left external iliac artery and superficial femoral artery were not demonstrated, the lumen of the left deep femoral artery below the inguinal ligament was enhanced with contrast dye.

Angiographic findings (Fig 1). At angiography, the full length of the left external iliac artery and superficial femoral artery were not demonstrated. Only the left deep femoral artery was visualized, but an intraluminal filling defect was seen at the proximal segment, suggesting thrombus formation. Luminal narrowing and wall irregularity were demonstrated in the left common iliac artery. The left internal iliac artery was elongated and dilated. Relatively rich collateral vessels were demonstrated from the left lumbar arteries to the groin. Therefore obstruction of the left external iliac artery was considered chronic.

Operative findings. General anesthesia was administered, and a median lower laparotomy was performed. The abdominal aorta and left common iliac artery could be dissected. However, the distal segment of the left common iliac artery acutely turned inward and penetrated the pelvic cavity (Fig 2). A vessel or cordlike structure, considered to be the remnant external iliac artery, was not identified between the left common iliac and common femoral arteries. The common femoral artery at the distal end, where the superficial and deep femoral arteries bifurcated, was dissected under the inguinal ligament. A retrograde dissected artery proximal to the common femoral artery turned deeply into the posterior pelvic cavity and seemed to be continuous with the left internal iliac artery, although this was not confirmed. Bypass grafting was performed with a 10 mm collagen-impregnated woven Dacron graft from the abdominal aorta to the left common femoral artery through the retroperitoneal space. The wall of the common femoral artery was thick, and its lumen was filled with fresh clots. Thrombi were removed from the common femoral and deep femoral arteries. However, thrombectomy from the superficial femoral artery was unsuccessful because of complete occlusion by organized thrombi. After thromboendarterectomy, the distal end of the graft was end-to-side anastomosed to the common femoral artery (Fig 3).

Postoperative course. Coldness of the foot disappeared, but numbness of the toes remained. Ankle brachial pressure index of the left leg was 0.5 immediately after surgery, and it had improved to 0.6 at 1-month follow-up.

A postoperative three-dimensional CT scan demonstrated a patent bypass graft between the abdominal aorta and the left common femoral artery (Fig 3). The left internal iliac artery runs anteriorly to the iliac bone and appears to be continuous with the left common femoral artery.
DISCUSSION

Congenital malformations of the iliofemoral arterial system are rare. Greeb\(^6\) described only 6 cases in a series of about 8000 patients who underwent angiography of the pelvic artery. Most reported cases have been iliofemoral arterial anomalies associated with persistent sciatic artery.\(^1,2\)

Congenital malformation of the external iliac artery has been classified into three groups by Tamisier et al\(^7\): group 1, anomalies in origin or course of the artery; group 2, hypoplasia or atresia compensated for by persistent sciatic artery; and group 3, isolated hypoplasia or atresia. Group 1 disorders are unlikely to cause chronic ischemia of the leg and are most often discovered at autopsy. High incidence of aneurysm formation and arteriosclerosis of the sciatic artery associated with acute occlusion and embolization has been documented for group 2 disorders.\(^8\) Group 3 disorders are most likely to be suspected because of chronic ischemia of the leg.

In our patient, a retrograde dissected artery proximal to the common femoral artery turned deeply into the posterior pelvic cavity and seemed to be continuous with the left internal iliac artery, although this was not confirmed. Postoperative three-dimensional CT angiograms show the left internal iliac artery running anteriorly to the iliac bone and appearing to be continuous with the common femoral artery, to which the distal end of the prosthetic graft was anastomosed. An abnormal artery running posterior to the

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**Fig 1.** Arteriogram demonstrates only the probable left common iliac and left internal iliac arteries. Deep femoral artery with intraluminal filling defect is visualized. Full length of the left external iliac artery and the superficial femoral artery are not demonstrated.

**Fig 2.** Intraoperative photograph demonstrates distal segment of the left common iliac artery acutely turned inward and penetrating the pelvic cavity. Vessel or cordlike structure, considered to be the external iliac artery, is absent between the common iliac and common femoral arteries.

**Fig 3.** Postoperative three-dimensional CT scan demonstrates patent bypass graft between the abdominal aorta and left common femoral artery. Well-developed left internal iliac artery runs anteriorly to the iliac bone and appears to be continuous with the left common femoral artery.
pelvis, suggestive of sciatic artery, was not demonstrated. Preoperative and postoperative angiograms also failed to demonstrate an abnormal artery suggestive of persistent sciatic artery. Thus persistent sciatic artery associated with hypoplasia of the ipsilateral iliac artery (Tamisier group 2 disorder) can be ruled out.

In isolated hypoplasia or atresia of the external iliac artery (Tamisier group 3), chronic ischemia of the leg usually occurs in childhood to young adulthood, with diagnosis between age 12 and 44 years.3, 7 Developed collateral vessels are found between the aorta and femoropopliteal system. Our patient had had no episode suggestive of leg ischemia and required no physical restriction for exercise such as running, climbing, or swimming until mild intermittent claudication developed 6 months before admission. Although our patient is unlikely to have a group 3 disorder, a case with aplasia of the external iliac artery in which the ipsilateral well-developed internal iliac artery directly continued into the common femoral artery was described byGREEBE.6 In such cases, symptoms of leg ischemia may not always develop in young patients.

Tamisier group 1 disorders are anomalies in the origin or course of the artery, usually discovered incidentally and most often at autopsy. Chronic ischemia of the lower limbs is unlikely because there is no associated obstructive lesion. Arterial anomalies interpreted as external iliac agenesis compensated for by an unusual internal iliac artery running directly into the common femoral artery or as an external iliac artery running a pelvic course is representative of this group.7 Although anatomic continuity between the left internal iliac artery and left common femoral artery was not proved in our case, the history strongly supports a possibly patent iliofemoral vessel continuity associated with relatively well-developed collateral vessels providing blood flow sufficient for normal leg function. The sudden deterioration of the leg seemed to be due to thrombotic obstruction of this iliofemoral continuity including the femoropopliteal artery system. Thrombotic tendency or intrinsic arterial wall abnormality might cause such systemic obstructions. Thus our case may be considered a Tamisier group 1 disorder or less likely a group 3 disorder.

REFERENCES

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