Acute Ischemia of Lower Limbs Caused by Thrombosis of Persistent Sciatic Artery: Case Report

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ABSTRACT

BACKGROUND: Hypoplasia of the external iliac artery with persistent sciatic artery (PSA) is rare. Patients with this condition seek medical treatment mainly due to the formation of persistent sciatic aneurysm or aneurysm complicated with distal ischemia.

CASE PRESENTATION: In the present study, we report a case of a patient with thrombosis of PSA without aneurysm in the left lower limb that underwent endovascular treatment.

CONCLUSION: Thrombosis of PSA may be associated with sedentary or other unhealthy lifestyles. Endovascular treatment of sciatic arterial diseases could be performed through the brachial artery approach, especially for those with hypoplasia of bilateral iliofemoral arteries.

KEYWORDS: thrombosis, persistent sciatic artery, ischemia, catheter-directed thrombolysis

Introduction

Clinically, congenital hypoplasia of the iliofemoral artery is very rare and usually found after autopsy or ischemic symptoms. Complications with persistent sciatic artery (PSA) are often reported in patients with hypoplasia of the external iliac artery. Such patients seek medical treatment mainly due to the formation of persistent sciatic aneurysm or aneurysm complicated with distal ischemia and are routinely surgically treated. In the present report, the condition of a patient with bilateral PSA with ischemia of the left lower limb was improved after catheter-directed thrombolysis through the left brachial artery.

Clinical Data

On May 24, 2018, a 54-year-old female patient, was admitted to our department for “a 4-week history of pain and numbness of the left lower limb.” The physical examination on admission revealed the following findings: the left foot was pale; bilateral femoral arteries; the left popliteal and dorsal pedal arteries were palpable; the skin temperature of the left lower limb was lower and with weak sensation, with a relatively good motor function. The patient previously had no atrial fibrillation and no intermittent claudication before admission. The following laboratory examination results were obtained. D-dimer was 1.1 mg/L; Computed tomography angiography (CTA) revealed that the bilateral internal iliac arteries were thickened. PSA had symmetrical trend along the posterior areas of the ipsilateral ilium-ischium-femur, extending to the ipsilateral popliteal artery without aneurysm, and a filling defect was present in the upper segment of the left sciatic artery. The bilateral external iliac arteries were thin, with almost occluded distal end (Figure 1). Considering the information of the medical history, physical examinations, and CTA, we made an initial diagnosis of acute ischemia of the left lower limb (Rutherford classification: grade IIa), which was suspicious of thrombosis or arterial embolism.

Treatment Strategy

On May 25, 2018, the patient underwent emergency catheter-directed thrombolysis of the left PSA through a puncture of the left brachial artery—for puncture the right femoral artery was impossible. The patient was placed in the supine position, and the modified Seldinger technique was implemented to puncture the left brachial artery through a microneedle, after which a 6F micro-sheath (Cook) was inserted. A cobra catheter was combined with a guidewire, which was directed to the left common iliac artery via the artery of the left upper limb. Arteriography confirmed the presence of a filling defect in the left PSA, with an approximate length of 15 cm. The guidewire passed through the thrombus and entered the distal end to the popliteal artery. The 4 mm × 120 mm (Admiral) balloon catheter was employed for the dilation of the lesions; then, a 10-cm thrombolyis catheter (Unifuse, Cook) was inserted. Postoperatively, urokinase at 800,000 IU/day was administrated for thrombolysis and enoxaparin at 4,000 IU/12h for anticoagulation. We established a decrease in D-dimer to 0.1 mg/L after 72 h. Arteriography reexamination showed a well-developed segment from the sciatic artery to the popliteal artery, with no obvious filling defect; mild luminal stenosis was detected (Arteriography at the hip- and knee-flexion positions, Figure 2). The catheter and sheath were removed, and the brachial artery was subjected to partial pressure dressing. At this
time, the numbness of the left lower limb disappeared, and the skin temperature returned to normal. On May 29, 2018, the patient was discharged from the hospital after recovery. He was prescribed administration of aspirin 100 mg qd for antiplatelet treatment and of rivaroxaban 10 mg qd for anticoagulation. Outpatient follow-up visits were performed at 1 and 3 months after the surgery, in which color Doppler ultrasound showed unobstructed blood flow from the left sciatic artery to the popliteal artery.

**Discussion**

Congenital variation of iliofemoral artery is rarer than variations of thoracic and abdominal aortas, especially those of both sides. Tamisier et al\(^3\) classified malformations of the external iliac artery into 3 groups: first, it occurred at the initial or some segments of the external iliac artery; second, hypoplasia or occlusion of the entire external iliac artery was present, but PSA had compensatory effects; third, hypoplasia or occlusion of the external iliac artery was only present. PSA is a rare congenital vascular abnormality with an incidence from 0.03% to 0.06%.\(^9\) In the embryonic development, the sciatic artery originates from the umbilical artery and finally reaches the foot. By the third month of pregnancy, the femoral artery is fully developed, and the sciatic artery degenerates to the popliteal artery and peroneal artery. In cases of hypoplasia of the femoral artery, the sciatic artery is present as an extension of the internal iliac artery.\(^10\)

Aneurysm degeneration easily occurs in PSA, leading to distal ischemia, sciatic neuropathy, or rare rupture, but there are few clinical symptoms in the early stage, and its detection is difficult. The main treatment method is surgery.\(^5\) Endovascular treatment of the lesions of PSA usually requires normal morphology of the contralateral iliofemoral artery for the provision of a pathway for this treatment.\(^4\) In cases of hypoplasia of the bilateral iliac arteries and the presence of a lesion at one side of PSA, surgical treatment seems to be the only option. In our patient, hypoplasia of bilateral external iliac arteries and femoral arteries occurred, and bilateral PSAs were present; thrombosis was established in the left sciatic artery. Endovascular treatment is infeasible through the conventional femoral approach. Thus, in this study, we used a puncture of the left brachial artery to solve that issue. After the catheter-directed thrombolysis, in the case of residual vascular stenosis, balloon dilation or stent implantation was further performed. If the patient had lesions at the distal end of the sciatic artery or the popliteal artery, endovascular treatment could not be implemented because the length of the catheter and guidewire was not sufficient due to the brachial artery approach utilized, and surgery was needed.

Patients with symptomatic PSA usually have aneurysm complicated with distal embolism or thrombosis or arteriosclerosis with occlusion, and scarce data are available on simple thrombosis of PSA.\(^5\) After obtaining a detailed medical history, we understood that the patient had the sedentary habit of playing mahjong, and liked to lean to the left side of the body. Therefore, the sitting posture leaning to the left side may cause whole-body pressure concentrated on the left hip. The part with the highest pressure was located near the ischial tuberosity, in which PSA was obviously compressed, and the vascular lumen was narrowed. Meanwhile, the artery was squeezed and injured by the sedentary status; endothelial injury also occurred, eventually leading to thrombosis. Arteriography and preoperative CTA showed lesions were located near the ischial tuberosity, which was consistent with the diagnosis made in this study. Therefore, patients are recommended to change their lifestyles and avoid sedentary status after surgery. At the same time, the center of gravity for the body should not lean to one side, minimizing the compression from external factors.
Conclusion
Thrombosis of PSA may be associated with sedentary or other unhealthy lifestyles. Endovascular treatment of sciatic arterial diseases could be performed through the brachial artery approach, especially for patients with hypoplasia of the bilateral iliofemoral arteries.

Author Contributions
Conception and design: HL, BT, JF.
Analysis and interpretation: HL, BT, JF.
Collection: HL, BT, JF.
Writing the article: HL, JF.
Critical revision of the article: BT, JF.

Informed Consent
Written informed consent was obtained from the patient for the use of his documents and images, which are included in the present publication.

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