

## Recurrent Coarctation of the Aorta: A Patient with Bilateral Persistent Sciatic Arteries

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**A 19-year-old female was referred to our department with a diagnosis of recurrent coarctation of the aorta. She had undergone end-to-side anastomosis of the left subclavian artery with the thoracic aorta at 9 days of age and extra-anatomic subclavian-to-femoral bypass grafting at 15 years of age because of hypertensive crisis. A preoperative 4-slice computed tomography (CT) scan demonstrated recurrent obstruction of the aorta and, unexpectedly, an associated anomaly of bilateral persistent sciatic arteries. She underwent a successful patch augmentation of the aorta and is currently leading a normal life without need for antihypertensive medication. Persistent sciatic artery is a rare congenital vascular anomaly and is known to develop aneurysm or critical lower limb ischemia. To our knowledge, this is the first report of a patient with coarctation of the aorta and bilateral persistent sciatic arteries. (Ann Thorac Cardiovasc Surg 2008; 14: 405–407)**

**Key words:** coarctation, persistent sciatic artery, computed tomography

### Introduction

Persistent sciatic artery is a rare congenital vascular anomaly and is usually detected by accident or in the process of clinical investigation for lower ischemia. Although aneurysm formation of the anomalous artery and lower limb ischemia are well documented clinical sequelae, hemodynamic features in the setting of coarctation of the aorta and persistent sciatic artery are absolutely unknown. In the present report we describe our first experience of a patient with such a peculiar condition.

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### Case

A 19-year-old female was referred to our department with recurrent coarctation of the aorta diagnosed by echocardiography, which presented pressure gradient of 40–50mmHg at the distal aortic arch. After birth she was diagnosed with simple coarctation of the aorta. She had undergone end-to-side anastomosis of the left subclavian artery with the thoracic aorta at 9 days of age. Because of upper body hypertensive crisis, she underwent extra-anatomic right subclavian artery to right femoral artery bypass using 8 mm Dacron graft at 15 years of age. The detailed reason for the bypass operation was unknown. When it was performed, bilateral persistent sciatic arteries were not detected. After referral, a 4-slice computed tomography (CT) with 3-D reconstructed images was performed to get more information about recoarctation and a right subclavian artery to right femoral artery bypass. It showed a narrow segment (about 7 mm in diameter) at the distal aortic arch, and it also revealed persistent bilateral sciatic arteries for the first time (Fig. 1). Angiography was difficult for a few access parts. A more detailed study was performed by 64-slice CT (Fig. 2). It revealed a shelf-like

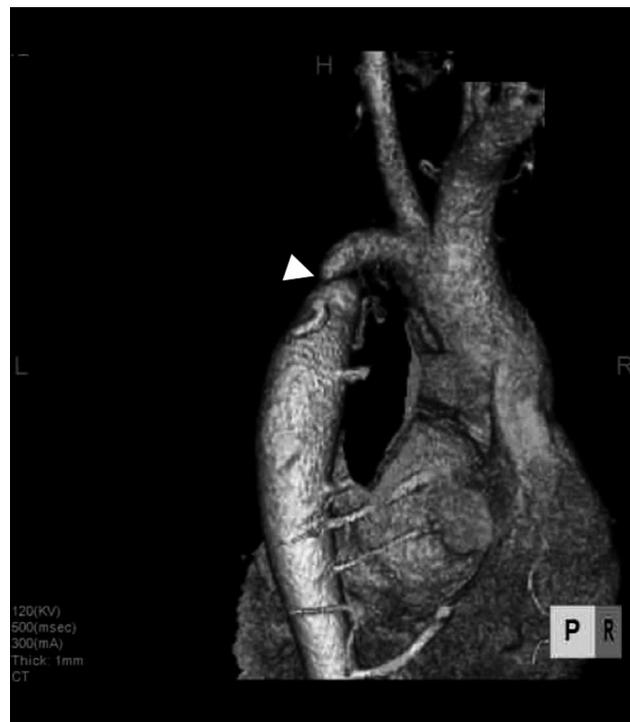


**Fig. 1.** A 4-slice 3-D-CT revealed persistent bilateral sciatic arteries (arrows) and recurrent coarctation of the aorta. The patent bypass graft from the right subclavian artery to the right femoral artery (arrow-head) was detected.

protrusion at the distal aortic arch and the diameter of recoarctation was 5.5 mm. Pressure gradient between upper body and lower body was about 20 mmHg, but she needed an antihypertensive drug for upper body hypertension. We decided to repair recurrent coarctation of the aorta. The bypass graft was patent and many collateral arteries from upper body to lower body existed. We thought the operation would be performed with no circulatory support. Patch augmentation was performed using simple clumping. The operative and postoperative course was uneventful. The pressure gradient disappeared, and an antihypertensive drug was discontinued.

## Discussion

The sciatic artery is a persistent embryologic axial artery. If involution of the axial artery fails, it may become the major inflow source to the lower extremity as a sciatic artery. The incidence of persistent sciatic artery was estimated to be from 0.01%<sup>1)</sup> to 0.05%.<sup>2)</sup> The persistent sciatic artery is convenient to define two types, complete and incomplete, based on the presence of hypoplastic changes of femoral arteries.<sup>3)</sup> The complete type with hypoplastic or absent superficial femoral artery is more common. Bilateral persistent sciatic



**Fig. 2.** A 64-slice CT detected recurrent coarctation of the aorta more clearly (arrowhead).

artery has been observed in 21.6% of the patients.<sup>4)</sup> In literature, 58.7% of the patients were symptomatic and 38.9% were asymptomatic.<sup>4)</sup> Major symptoms were ischemia of the low extremity and a gluteal mass of sciatic artery aneurysm. Associated congenital anomalies were lower extremity hypertrophy, musculoskeletal malformation, osseous hypotrophy, and arteriovenous fistula. This is the first reported case of two anomalies, coarctation of the aorta and bilateral persistent sciatic arteries, occurring in the same patient. Multislice CT is very effective to detect a persistent sciatic artery. Failure to recognize a persistent one as the major blood supply to the lower extremity may lead to an incorrect diagnosis and inappropriate surgical intervention. In this case, why the bypass operation was performed is unknown. The upper body hypertensive crisis might be caused by both recurrent coarctation of the aorta and bilateral persistent sciatic arteries. Instead of an extra-anatomic right subclavian artery to the right femoral artery bypass, other surgical intervention could be performed by accurate diagnosis. But the bypass made the performance of a patch augmentation possible with no circulatory support. DiBardino et al. reported that patch aortoplasty was used for recurrent aortic obstruction in

half of their child patients, and the results were satisfactory.<sup>5)</sup> Our patient was an adult, so the recurrence of aortic coarctation was thought to be less frequent. The persistent sciatic artery has a high incidence of aneurysm formation and limb-threatening ischemia complication. Our patient is now carefully monitored by regular physical examinations and noninvasive imaging.

## References

1. Greebe J. Congenital anomalies of the iliofemoral artery. *J Cardiovasc Surg (Torino)* 1977; **18**: 317–23.
2. Mayschak DT, Flye MW. Treatment of the persistent sciatic artery. *Ann Surg* 1984; **199**: 69–74.
3. Bower EB, Smullens SN, Parke WW. Clinical aspects of persistent sciatic artery: report of two cases and review of the literature. *Surgery* 1977; **81**: 588–95.
4. Ikezawa T, Naiki K, Moriura S, Ikeda S, Hirai M. Aneurysm of bilateral persistent sciatic arteries with ischemic complications: case report and review of the world literature. *J Vasc Surg* 1994; **20**: 96–103.
5. DiBardino DJ, Heinle JS, Kung GC, Leonard GT Jr, McKenzie ED, et al. Anatomic reconstruction for recurrent aortic obstruction in infants and children. *Ann Thorac Surg* 2004; **78**: 926–32.