Peripheral Arterial Disease with Small Aorta Syndrome: A Case Report

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We report a case of a 79-year-old woman who experienced difficulty in walking. Contrast-enhanced computed tomography revealed severe stenosis and calcification of the infrarenal aorta. The minimum diameter of the infrarenal aorta was 8 mm and that of the common femoral artery was 4 mm. Other vessels with abnormalities were the hypoplastic left subclavian artery and the left-sided inferior vena cava. The patient was treated with right axillobifemoral bypass. In patients with small aorta syndrome, the graft patency rate is low, and long-term follow-up is important.

Keywords: small aorta syndrome, peripheral arterial disease, bypass procedure

Introduction

Aortoiliac artery hypoplasia has been reported as small aorta syndrome (SAS), and it often coexists with peripheral arterial disease (PAD). We report a case involving an elderly patient with difficulty in walking caused by SAS with arteriosclerosis. The patient was successfully treated with right axillobifemoral bypass.

Case Report

A 79-year-old woman presented to our hospital with difficulty in walking, which began 10 days prior. Her past medical history included a vaginal hysterectomy for uterine prolapse and a radical operation for anal prolapse. Her blood pressure was 160/74 mmHg in the right arm and 144/72 mmHg in the left arm. Her ankle brachial pressure index was 0.23 in the right leg and 0.26 in the left leg, and both femoral arteries were not palpable. Her heart and lung functions were normal. Blood sampling test showed an aspartate aminotransferase level of 17 U/L, an alanine aminotransferase level of 7 U/L, and a creatinine (Cre) level of 0.61 mg/dL. She was nonsmoker and did not have diabetes. Contrast-enhanced computed tomography (CT) showed severe stenosis and calcification of the infrarenal abdominal aorta. The minimum diameter of the infrarenal abdominal aorta was 8 mm and that of the aortic bifurcation was 10 mm (Figs. 1 and 2). The diameter of the femoral artery was 4 mm (Fig. 3). The left subclavian artery was hypoplastic, and the left-sided inferior vena cava joined the inferior vena cava at the level of the left renal vein. The arteriosclerotic changes of the thoracic aorta and neck vessels were very small.

As calcification of the infrarenal abdominal aorta was very severe, we planned an extra anatomic bypass. A right axillobifemoral bypass with a FUSION vascular graft of 7 mm × 80 cm (GETINGE, Tokyo, Japan) and a left common femoral endarterectomy were performed. After the operation, cilostazol (200 mg/day) was administrated. The symptoms improved, and the postoperative CT findings revealed good patency of the bypass graft.

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Aortoiliac hypoplasia was reported for the first time in 1847 by Quain. Subsequently, this disease has been referred to as the small blood vessel syndrome, hypo-plastic aortoiliac syndrome, and SAS. SAS has rarely been reported in Asia, and about 5%–16% of patients with aortoiliac occlusion are diagnosed with SAS. SAS has been reported more frequently in young and obese women; whereas the etiology of SAS is not known, congenital defects, Takayasu disease, radiation exposure, pill use, smoking and high low-density lipoprotein levels are considered to be risk factors.

The SAS criteria are not set yet but several conditions as follows are available: (1) the diameter of the abdominal aorta just below the renal artery is <14 mm or <10.3 mm just above the aortic bifurcation; (2) aortic bifurcation is present between the third and fourth lumbar vertebra at an angle of <20°–30°; (3) a straight-shaped iliac artery; and (4) a common femoral artery diameter of <5 mm. Our case met the conditions (1) and (4).

In our case, a clinical feature of discrepancy in the blood pressure between arms was seen. CT showed that the left subclavian artery was hypoplastic but did not show arteriosclerotic changes. As a result, a relation between our case and aortitis was not found, and the etiology of our case was unclear.

As causes of aortoiliac occlusion, both the progress of aortic narrowing and blood flow disturbance at the aortic bifurcation are thought to increase stress on the blood vessel walls and damage to the intima.

Surgical methods, such as bypass procedures, endarterectomy, and sympathectomy, and medication have been used to treat SAS. Aorto-bifemoral bypass procedures are generally performed; but in our case, the infrarenal aorta calcification was severe. In addition, the diameter of the abdominal aorta was so small. It has been predicted that it would be difficult to secure adequate proximal site blood flow using a narrow artificial graft. As a result, an extra anatomic bypass was chosen.

The difference in patency between knitted Dacron and expanded polytetrafluoroethylene prosthesis is unclear. In contrast, it is important to select an artificial graft with a similar diameter to a native artery. Several reports have suggested that graft patency in patients with SAS has been much lesser than that in patients with PAD. Thus, close follow-up is important.

**Conclusion**

SAS operation results found decreased graft patency compared with those of general PAD. Thus, close monitoring is important for patients with SAS.

**Disclosure Statement**

All authors have no conflict of interest.

**Author Contributions**

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Critical review and revision: all authors
Final approval of the article: all authors
Accountability for all aspects of the work: all authors
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