Takayasu arteritis is an immune-mediated vasculitis of the aorta, major aortic branches, and pulmonary arteries. It is rare, with an estimated 2.6/1,000,000 incidence in North America, predominantly affecting young East Asian women in the second to fourth decades of life. Presentation and manifestations can vary but include fever, myalgia, weight loss, cerebral ischemia, mesenteric ischemia, and extremity ischemia. Panarteritis leads to chronic inflammation and thickening of the entire aortic wall, resulting in stenosis and either continuous involvement or skip lesions along the length of the aorta. Middle aortic syndrome is a segmental narrowing of the distal descending or abdominal aorta. It may be congenital, with incomplete fusion or overfusion of the paired embryonic aortas, or acquired, such as with Takayasu or giant cell arteritis, neurofibromatosis, or retroperitoneal fibrosis. The patient whose case is presented here consented to share her medical information for academic and educational purposes.

**CASE REPORT**

This is a 48-year-old woman with Takayasu arteritis for >10 years and resistant to traditional disease-modifying antirheumatic drugs, responding only to steroid treatment. The patient's comorbidities included alopecia, nephrotic syndrome, and systemic lupus erythematosus. She was admitted to the hospital with constant abdominal pain of 6 weeks' duration, with postprandial exacerbation suggestive of mesenteric angina. The patient also had dyspnea secondary to pulmonary edema and pleural effusions, lower limb edema, and oral ulcers. There were no signs of peritonitis. The lower limb pulses were not palpable; however, the feet were adequately perfused, with no motor or sensory dysfunction. Her systolic blood pressure measured 190 to 200 mm Hg in both arms despite maximal treatment with four appropriate antihypertensive agents. Computed tomography angiography demonstrated a severe midaortic stenosis and calcification just proximal to the celiac artery and a more distal severe stenosis in the infrarenal aorta (Fig 1). There was no celiac artery, superior mesenteric artery, or renal artery stenosis. There were multiple, significant dilated collaterals along the abdominal wall (Fig 2). Her erythrocyte sedimentation rate was 150 mm/h, consistent with an acute inflammatory process, and therefore a diagnosis of midaortic syndrome secondary to acute-on-chronic Takayasu arteritis was made.

The patient began high-dose pulsed therapy, but her abdominal pain failed to improve after 3 days. She did not have signs of acute mesenteric ischemia, and she was not anticoagulated. It was decided to pursue endovascular treatment of the aortic stenoses with uncovered balloon-expandable stents to avoid compromising the visceral arteries. The procedure took place under conscious sedation and with percutaneous access. After predilation with a 7-mm balloon, the proximal lesion was stented with a 10-×37-mm Express LD (Boston Scientific, Marlborough, Mass) bare-metal stent and postdilated to 12 mm (to match the adjacent normal luminal diameter). The infrarenal lesion was predilated with a 7-mm balloon, stented using a 10-×37-mm Express LD bare-metal stent, and postdilated with a 12-mm balloon. Completion angiography revealed patent mesenteric and renal vessels and improved aortic patency (Fig 1, c and d). There were no complications. The patient immediately recovered palpable pulses in the lower extremities, was prescribed acetylsalicylic acid, and was discharged in stable condition with improvement in her abdominal pain.

Aortic stenting dramatically improved the patient's abdominal pain, obviating the need for analgesia, and her dietary intake improved. At 8 weeks, her dyspnea and pleural
Fig 1. a, Sagittal maximum intensity projection reconstruction demonstrating midaortic calcification with severe luminal narrowing (blue arrow) and severe infrarenal stenosis (white arrow). b, Reformatted axial and corresponding sagittal views demonstrating nearly occlusive supraceliac stenosis (red arrows). c, Intraoperative aortogram demonstrating stent in supravisceral aorta with a patent visceral segment. d, Intraoperative aortogram demonstrating patent visceral vessels and infrarenal stent.
effusions resolved. At 10 weeks, she achieved a target blood pressure of 140 mm Hg systolic. The patient’s ankle-brachial index was 0.96 on the right and 0.96 on the left at 9-month follow-up. Because of the patient’s chronic lupus nephritis and borderline renal function (glomerular filtration rate, <40 mL/min), stent patency has been assessed by duplex ultrasound. At 9 months after the procedure, the aortic stents were patent with no hemodynamically significant stenoses. At 12 months postoperatively, the patient continued to be symptom free. Her blood pressure continues to be well controlled with an angiotensin receptor blocker, beta blocker, and furosemide. She will continue to be monitored both clinically and by duplex ultrasound.

Open surgery remains the “gold standard” for middle aortic syndrome; however, a small number of cases of endovascular stenting have been reported in the literature. Many report early success, but long-term results are lacking. One multicenter retrospective study reported outcomes for 79 consecutive patients with Takayasu arteritis treated with either an endovascular or open approach. There was a higher incidence of aortic complications—restenosis, thrombosis, bleeding, and stroke—in the endovascular group (50%) compared with open (37.5%); higher inflammatory markers were independently associated with complications. The largest case series of open treatment, by bypass, patch angioplasty, interposition graft, or splanchnic and renal reconstruction, for developmental coarctation causing middle aortic syndrome suggests durable results and few long-term treatment failures. Our patient suffered from pulmonary edema and symptomatic pleural effusions and was unfit for open thoracoabdominal surgery (extra-anatomic bypass was not considered a viable long-term option), and endovascular therapy provided a low-risk and ultimately successful treatment option for mesenteric ischemia, abdominal pain, and hypertension.

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