A late diagnosis and treatment of coarctation of aorta six months after presenting with aortic dissection

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ABSTRACT

Coarctation of the aorta (CoA) is a congenital condition causing narrowing of the aorta, typically just after the left subclavian artery. Most patients with CoA are diagnosed at birth or during infancy. However, they can also be undiagnosed later in adulthood with minimal symptoms to show or treatment-resistant hypertension. However, some patients may also present with life-threatening medical emergencies that may lead to an undiagnosed CoA. This case is a 40-year-old man with hypertension who presented with a late diagnosis of CoA on computed tomography imaging six months after ascending aorta dissection repair. The patient's CoA was repaired via an endovascular approach with stent placement and post-dilatory balloon angioplasty. His CoA segmental blood pressure gradient was 25 mmHg and decreased to 3 mmHg post-procedure. The patient has done well post-procedure, and his blood pressure had been within normal limits.

Keywords: Aortic coarctation, aortic dissection, hypertension, congenital heart defect

INTRODUCTION

Coarctation of the aorta (CoA) is a congenital condition causing narrowing of the aortic arch, often just beyond the left subclavian artery. It accounts for 5–7% of congenital heart defects, with an incidence of 4 in 10,000 live births.[1] In neonates, after the ductus arteriosus closes, they can present with a rapidly increased afterload and left ventricle pressure overload, with subsequent cardiogenic shock if not corrected soon enough. Although prenatal screening for (CoA) is the most commonly undiagnosed congenital heart defect detected during screening, it is still important to maintain a high suspicion if any screening parameters are outside the expected ranges.[2] Although the diagnosis is most often made in newborns, less severe cases can persist into adulthood. Adults most often present with markedly elevated upper extremity hypertension that is refractory to previous medical therapy. The hypertension can be accompanied by headache, epistaxis, heart failure, and, although rare, aortic dissection or stroke.[3] The present case is a 40-year-old man with a late diagnosis of (CoA) found on computed tomography imaging six months after aortic dissection repair.

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DOI: 10.12746/swrccc.v13i54.1403

CASE

A 39-year-old man with a past medical history significant for hypertension arrived at a rural emergency department with sudden onset chest pain while lifting weights. A computed tomography with angiography was performed and revealed a type A acute aortic dissection, and he was subsequently transferred to a higher level of care and managed with a surgical repair of his aorta. The patient did well post-surgery and was discharged with plans to establish care with a cardiologist near him and repeat CTA within 3–6 months. The repeat CTA revealed significant coarctation of the proximal descending aorta that measured 2.2 mm in length and 3.7 mm in width (Figures 1), as well as prominent dilation of collateral arteries. The patient was subsequently scheduled for endovascular repair using the following procedure steps.

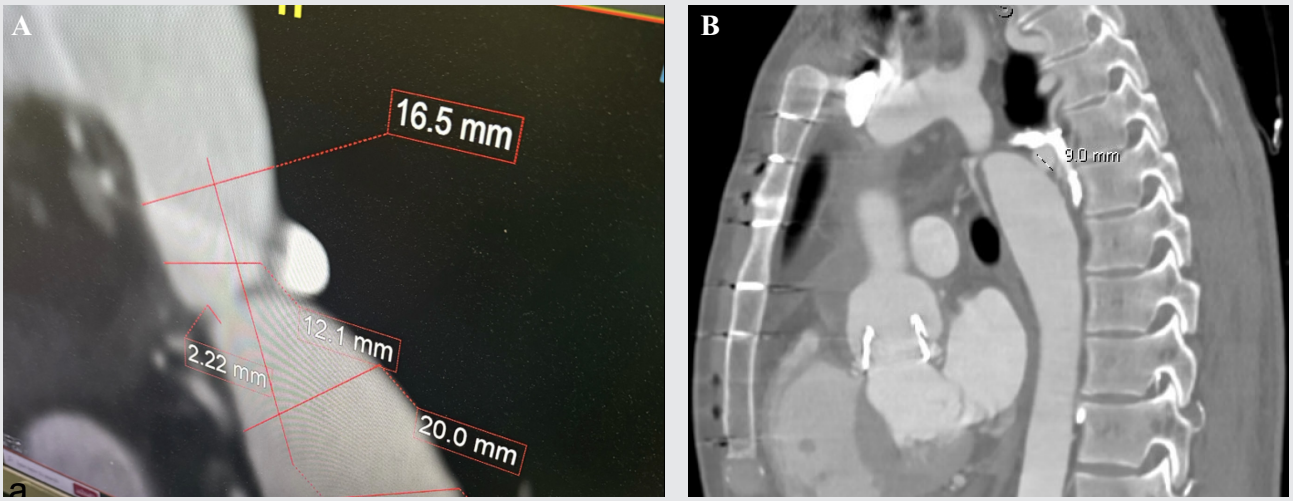

Figure 1. Coronal CTA of the aorta with measurements (**A**) and sagittal chest CTA (**B**) demonstrating significant coarctation of the proximal descending aorta.

Procedure

The right femoral artery was accessed and preclosed. A 6F pigtail catheter was placed in the proximal descending aorta through right radial access, as noted in Figure 2. Through serial dilatations, the right femoral artery sheath was upsized to 20F. The coarctation segment was crossed retrogradely with a 5F multipurpose catheter and Glidewire. The thoracic endograft device was advanced through the right groin and positioned just distal to the left subclavian artery. Next, the endograft was deployed and landed at its intended position. The CoA was stented using Gore Ctag Conformable Thoracic Stent Graft 21 × 21 × 10 cm. The precise placement was ensured through repeated angiography using the pigtail catheter parked in the proximal descending aorta. An aortogram showed good flow to all aortic arch vessels and the left subclavian artery. The coarctation showed dilation, no evidence of endoleak, and a good position of the stent graft, as shown in Figure 3.

Gradients were remeasured, which demonstrated a 3 mm residual mean gradient (initial gradient was 25 mmHg). The patient was monitored overnight and did well post-procedure. The patient was discharged the following day with aspirin and continued on his hypertension medications. Since hospital discharge, the patient has done well and his blood pressure has been within a normal range.

Discussion

Coarctation of the aorta is often detected in children, but adult cases, like our patient, are not uncommon. If a patient presents with any physical findings

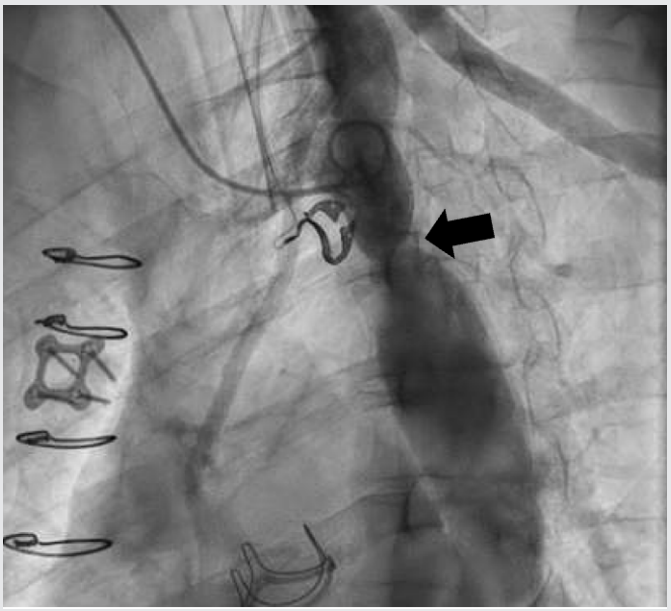

Figure 2. Thoracic aortogram with pigtail catheter parked in proximal descending aorta, just proximal to coarctation.

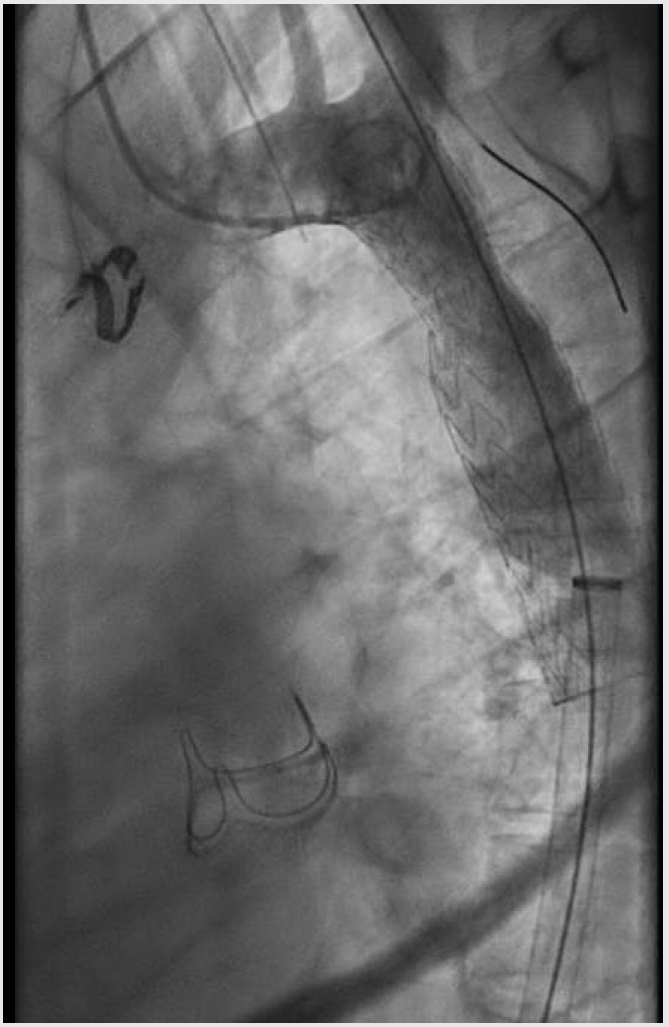

Figure 3. Final angiograph showing a patent descending aorta after stent placement and post dilation.

of CoA or treatment-refractory hypertension, further investigation is needed. Various imaging techniques can detect CoA, with catheter angiography being the gold standard.[4] However, noninvasive methods like transthoracic echocardiography are commonly used first to assess pressure gradients and detect other cardiac abnormalities.[5] Advanced imaging, like cardiac magnetic resonance imaging or CTA, vary in their specific utility but are useful for inconclusive echocardiograms and further surgical planning. Our patient, however, was diagnosed incidentally on CTA during repeat imaging post-aortic dissection repair.

In this case, the CoA was repaired with covered stent implantation, but several other treatment options exist, notably surgery or balloon angioplasty. The different treatment options are not mutually exclusive and are often used together. The patient's age, degree of coarctation, and whether any previous procedures have been attempted are several factors that are considered when selecting a treatment. Each treatment also has specific risks that need to be considered, including the risk of recoarctation, aneurysm formation, stent fragmentation, etc.[6–8]

Patients with surgical or endovascular repair of CoA are currently recommended to follow up yearly with a cardiologist. It is recommended to perform postoperative thoracic imaging to assess for aortic dilation or aneurysm and have repeat MRI or CT scans at 5-year intervals.[9] Another symptom that needs attention is the appearance or reappearance of resting or exercise-induced arterial hypertension, which should be aggressively managed with medication, excluding any return of the CoA.[9]

Article citation: Sheedy M, Cevik C, Trinidad-Hernandez M. A late diagnosis and treatment of coarctation of aorta six months after presenting with aortic dissection. The Southwest Respiratory and Critical Care Chronicles 2025;13(54):39–42
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Submitted: 12/4/2024
Accepted: 12/15/2024
Conflicts of interest: none

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