

# Incidental finding of hypertension and diminished femoral pulses: short-segment stenosis of the aorta just distal to the origin of the left subclavian artery

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## Introduction

Coarctation of the aorta is a congenital condition generally, and may vary from mild to severe. Symptomatology depends on early or late presentation. Young patients may present within the first few weeks of life with poor feeding, tachypnea and lethargy. They usually progress to overt congestive heart failure and shock. Older children may present with a murmur or hypertension. Diagnosis is often made after hypertension is detected as an incidental finding during evaluation of other problems, such as trauma or more common illnesses. Coarctation of the aorta can be cured surgically.

## Case study

A 15-year-old boy was referred from the peripheral clinic with a soft tissue elbow injury after a fall during a soccer match. Background history was that he was healthy, regularly participated in sporting activities, had no previous surgery and was not taking any medication. Upon physical examination, his blood pressure measured 203/103 mmHg and 200/98 mmHg in the left and right arms, respectively. Peripheral pulses were strong in both upper limbs, but feeble in the femoral and dorsalis pedis bilaterally. Blood pressure in the lower limbs was not measurable. The only other abnormality was a heaving apex beat in the midclavicular line. The electrocardiogram revealed evidence of left ventricular hypertrophy.

Computerised tomographic angiography of the aorta and its branches noted a constant, short-segment stenotic area in the aorta distal to the origin of the left subclavian artery (Figure 1). Echocardiography-Doppler studies confirmed coarctation of the aorta, probably postductal, with the highest velocity of 4.9 m/second and pressure gradient of 98 mmHg. The patient underwent catheter intervention with stenting and dilatation (Figures 2 and 3).

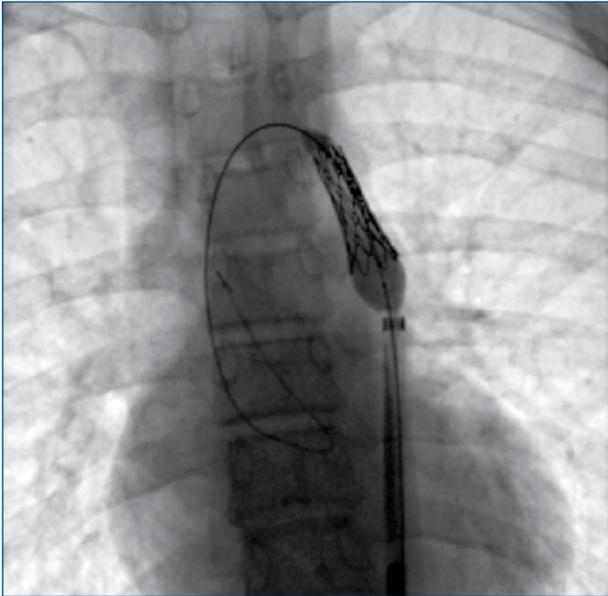
## Discussion

Thoracic aortic coarctation is classically defined as a haemodynamically significant congenital narrowing of the upper descending thoracic aorta adjacent to the site of attachment of the ductus arteriosus.<sup>1</sup> Its prevalence varies from 5-8% of all congenital heart defects.<sup>2</sup> It is most often detected because of a murmur or hypertension on routine examination.<sup>2</sup> Delayed or absent femoral pulses and an arm or leg systolic blood pressure difference of 20 mmHg or more in favour of the arms, may be considered as evidence for coarctation.<sup>2</sup>

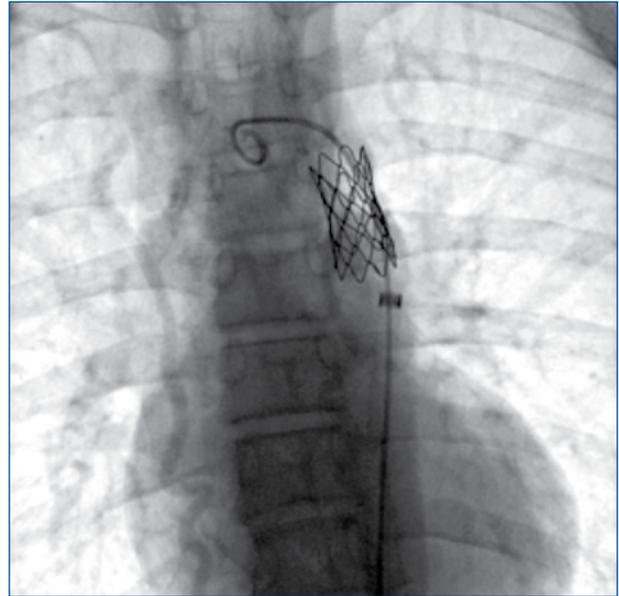
Two hypotheses have been postulated to explain the pathogenesis of coarctation of the aorta. According to the



Figure 1: Formal angiogram of the thoracic aorta, demonstrating a short-segment stenosis of approximately 20 mm distal to the origin of the left subclavian artery



**Figure 2:** Formal angiogram of the thoracic aorta. The pigtail catheter is in position and measurements were taken. The stent is being deployed across the coarctation of the aorta



**Figure 3:** Antero-posterior radiograph of the chest, demonstrating successful deployment of the stent in the proximal descending thoracic aorta. The catheter is being withdrawn

first, an abnormal preductal flow or abnormal angle between the ductus and coarctation are invoked. Spontaneous postnatal closure of the ductus arteriosus completes the development of the aortic obstruction.<sup>2</sup> According to the second, an abnormal extension of the ductal tissue into the aorta (ectopic ductal tissue) creates a coarctation shelf, and with ductal closure, development of aortic coarctation.<sup>2</sup>

Catheter intervention for treatment of coarctation is being increasingly applied as an alternative to surgical treatment.<sup>3</sup> Although outcomes have been significantly improved following surgical intervention, the burden of residual

disease in the form of hypertension; the burden of residual lesions, especially aortic valve disease, and acquired valve disease, and recurrent or persistent obstruction, are significant, and require ongoing clinical surveillance and treatment.<sup>3</sup>

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