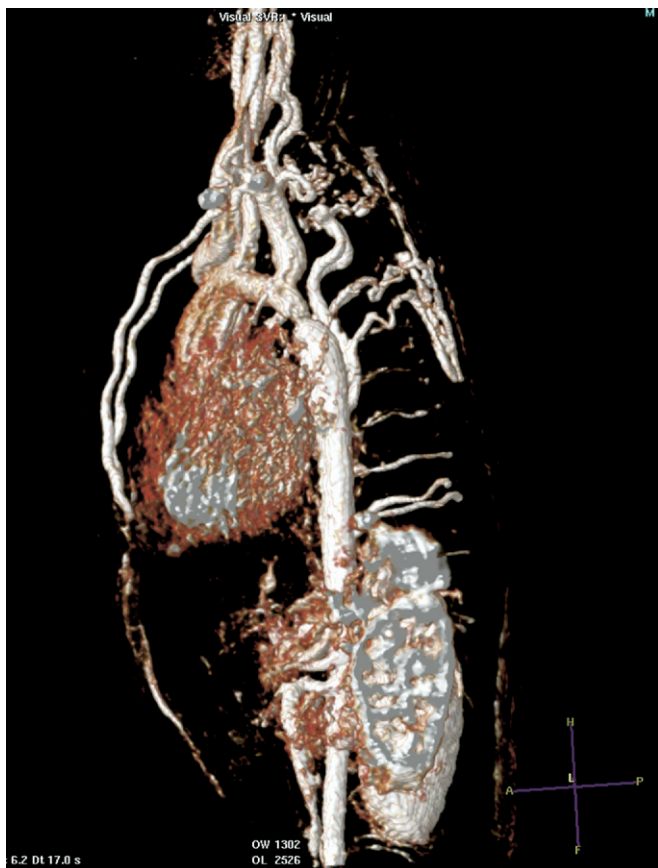


## Coarctation of the Aorta



**Figure 3.** Three-dimensional reconstruction of gadolinium-enhanced magnetic resonance angiogram demonstrating severe coarctation of the aortic isthmus, approximately 2 to 3 mm in diameter. Note the extensive collateral vessels to the descending aorta.

**A** 6-year-old boy was found incidentally to have a blood pressure of 160/120 mm Hg. Renal ultrasound scanning with Doppler demonstrated a delayed and flattened (ie, tardus-parvus) arterial waveform in the renal artery and distal aorta (Figure 1A; available at [www.jpeds.com](http://www.jpeds.com)). With 4 extremity blood pressure measurements, a 30 mm Hg differential between upper and lower extremities was shown. With a chest radiograph, a rib notching was shown (Figure 2; available at [www.jpeds.com](http://www.jpeds.com)). With cardiac magnetic resonance imaging, a severe aortic coarctation was revealed (Figure 3).

Stage II hypertension (>99th percentile for age + 5 mm Hg) requires prompt evaluation, because an organic etiology is often identified.<sup>1</sup> In children between 1 and 10 years of age, renal disease and aortic coarctation are most

common.<sup>2</sup> Coarctation is easily recognized in the neonate with decreased femoral pulses and evidence of cardiogenic shock or congestive failure. Beyond critical coarctation in infancy, however, patients often have no symptoms, leading to a median age of diagnosis of 5 years.<sup>3</sup> These cases are often discovered incidentally on the basis of elevated blood pressure at an unrelated visit. In infants, cardiomegaly and pulmonary congestion may be shown on chest radiographs, whereas rib notching and flattening of the aortic knob are possible findings in older children (Figure 2). Because renal ultrasound scanning is not routinely obtained during evaluation for coarctation, the tardus-parvus waveform shown here (Figure 1A) is not frequently seen; however, these findings are consistent with proximal arterial flow obstruction.<sup>4</sup> Tardus refers to delayed, early systolic acceleration, and parvus refers to diminished amplitude and rounding of the systolic peak. Echocardiography is the main diagnostic modality for coarctation; however, acoustic windows may be poor in older patients. In these cases, cardiac magnetic resonance provides precise noninvasive assessment of anatomy and hemodynamic severity of the obstruction, extent of collateral vessels supplying the descending aorta, and ventricular size and function.<sup>5</sup>

Galina Lipton, MD  
Division of Emergency Medicine

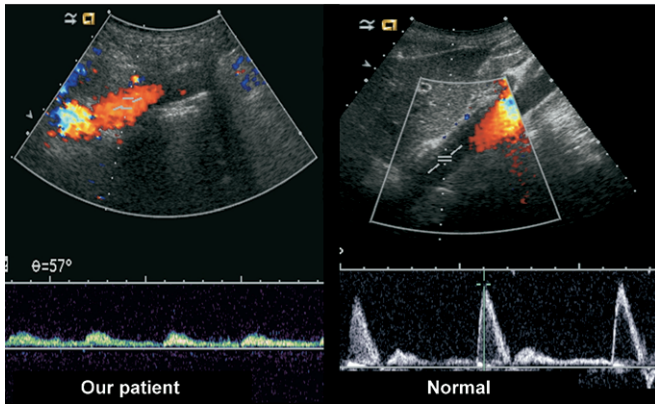
Tal Geva, MD  
Division of Cardiology

Joshua Nagler, MD  
Division of Emergency Medicine  
Children's Hospital  
Boston, Massachusetts

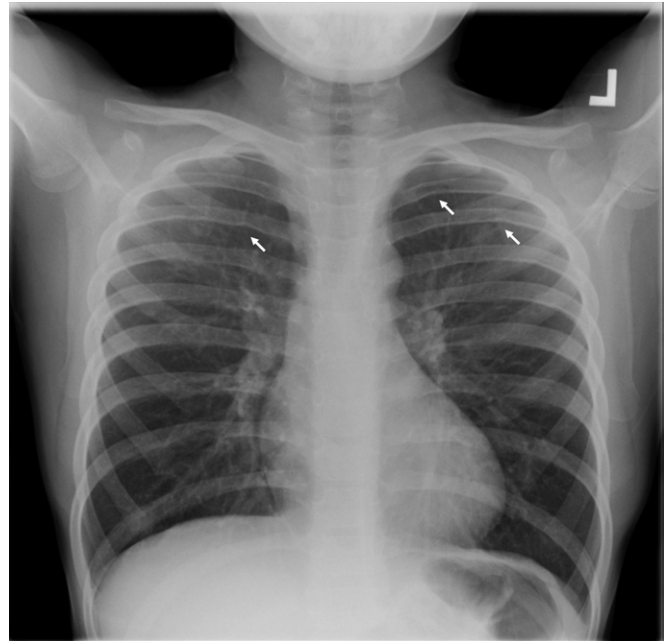
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**Figure 1.** Renal ultrasound scanning. **A**, Renal ultrasound scan with Doppler demonstrating a tardus-parvus waveform in a 6-year-old boy. **B**, Renal ultrasound scan in a healthy age-matched control subject.



**Figure 2.** Chest radiograph reveals bilateral rib notching (examples noted by white arrows).