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Images in Cardiology

"Figure 3" Sign in a 20-Year-Old Man With Secondary Hypertension

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A 20-year-old man was diagnosed with hypertension. What means the finding in the chest X ray of this young man with hypertension? Blood pressure was 160/100 mm Hg in both arms, and 130/80 mm Hg in the legs. A slowed upstroke of the femoral pulse with radiofemoral delay was noticed. A grade 4/6 telesystolic murmur was heard at the left sternal border irradiated to the interescapular region. The electrocardiogram showed incomplete right bundle branch block. In the chest radiograph, there was inferior rib notching (Roesler sign), predominantly on the left side; a "figure 3" sign (Fig. 1A) beneath the aortic knob was also noticed. Transthoracic echocardiogram revealed a peak systolic gradient of 50 mm Hg across the descending aorta. Computed tomography angiography showed hypoplasia of the aorta distal to the left subclavian artery and before the coarctation (which had a diameter of 4 mm), with prominent collateral circulation (Fig. 1, B-D). Balloon angioplasty and stenting was performed without complications. The "figure 3" sign usually is attributed to dilatation of the aorta above and below the coarctation.[1,2] In this case, it appears with proximal hypoplasia of the aorta, which can be present in up to 81% of cases, usually is part of the same disease spectrum,[3] and is the most definitive antenatal sign of postnatal coarctation.[4]

Novel Teaching Points

- In a young patient with secondary hypertension, the diagnosis of coarctation of the aorta always has to be ruled out.
- The presence of a slowed upstroke of the femoral pulse and radiofemoral delay associated with the "figure 3" sign can help to establish the diagnosis and guide further evaluations.
- Coexistence of coarctation of the aorta and aortic hypoplasia is a common finding.

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Disclosures

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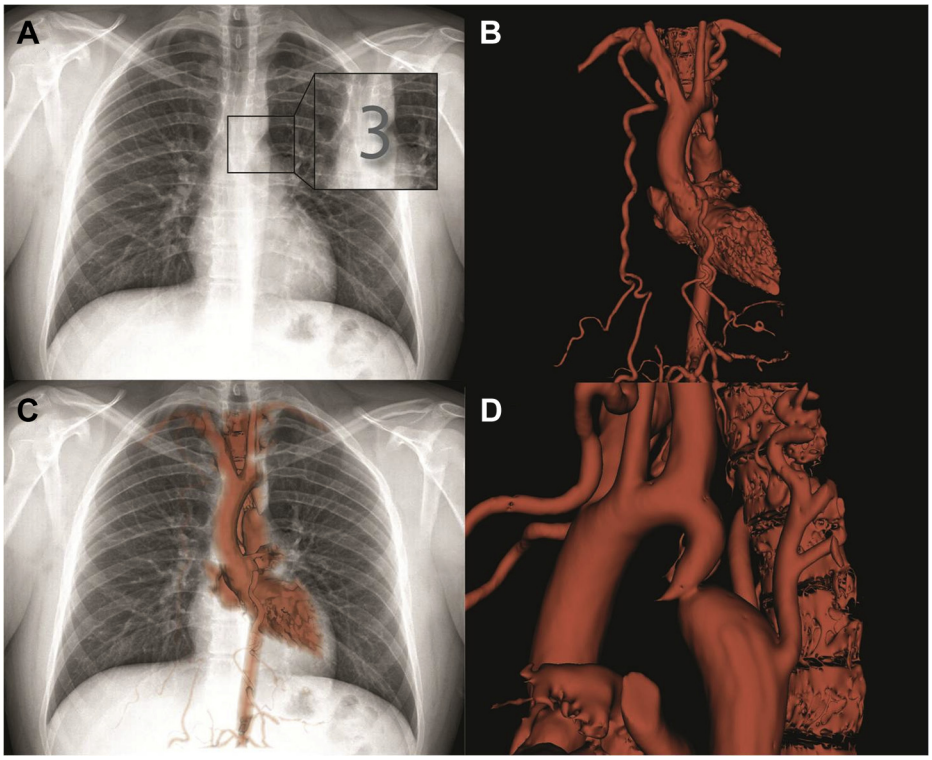

Figure 1. (**A**) Chest radiograph showing the “figure 3” sign (magnified image is included). (**B, D**) Reconstructed computed tomography angiography showing hypoplasia of the aorta proximal to the coarctation and post-stenotic dilatation; the left internal mammary artery was digitally removed in order to visualize the coarctation site. (C) The reconstructed image is superimposed on the chest radiograph to show the correlation of the "Figure 3" sign with the coarctation site; the left ventricle’s cavity size is represented with a volumetric reconstruction.