

AORTIC COARCTATION

A.S. Michel¹, C. Mai¹, L.V. Flore², B. Claikens¹

Key-word: Aorta, stenosis or obstruction

Background: During elbow surgery on a 20-year-old competition level volleyball player, seriously elevated arterial pressures were found. Systolic pressures were as high as 200 mmHg and diastolic pressures as high as 120 mmHg.

At clinical examination there was a discrepancy between these systolic pressures measured at the arteria brachialis and the palpation of the lower limbs: at the arteria femoralis and tibialis posterior only faint pulsations could be felt and the arteria dorsalis pedis could not be palpated at all.

Electro- and echocardiographic examination withheld left chamber hypertrophy. Magnetic resonance angiography (MRA) was performed to evaluate the thoracic vessels.

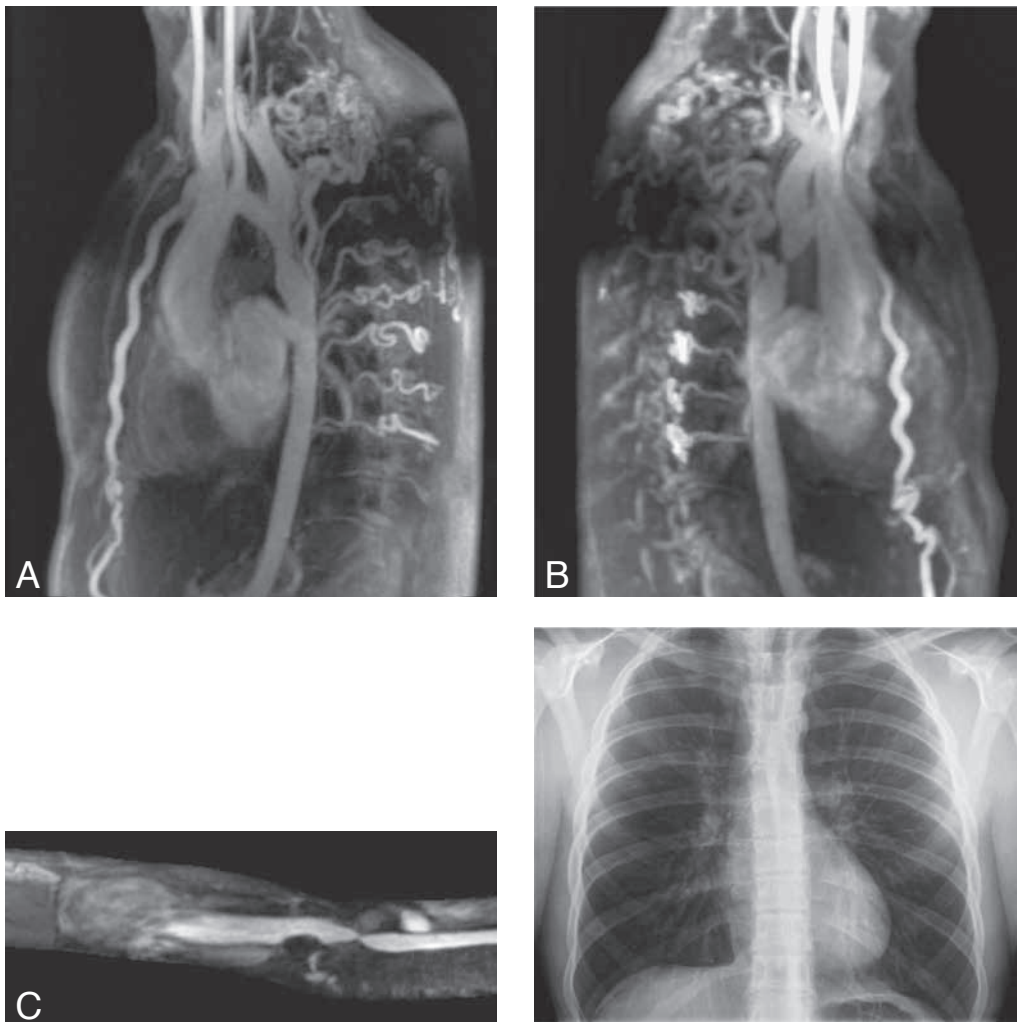


Fig.

1A	1B
1C	2

Work-up

MR Angiography (MRA) of the thoracic vessels (Fig. 1) consists of Multiplanar Reconstruction (MPR) MRA (A), three-dimensional MRA (B), and curved coronal MPR MRA (C). MRA shows a severe narrowing of the thoracic aorta just distal to the left subclavian artery. As a result, the descending aorta and its branches are perfused by collateral vessels from the axillary and internal thoracic arteries through the intercostal arteries.

Chest radiography (Fig. 2) shows typical notching of the posterior third of ribs 6 till 8 due to impaction by large collateral arteries and subtle indentation of the aortic wall at the site of coarctation, which produces a '3 sign'.

Radiological diagnosis

Based on clinical and imaging findings the diagnosis of *aortic coarctation* was made.

Discussion

Aortic coarctation is a narrowing of the thoracic aorta most commonly located immediately distal to the left subclavian artery. It is a common malformation accounting for 5 to 8% of all congenital heart disorders and it occurs 2 to 5 times more often in males than females. Its clinical manifestation varies in different age groups. In previously undiagnosed adults, as in our case, the classic presentation sign is hypertension, possibly leading to headache, epistaxis, heart failure and aortic dissection. Classic clinical findings are hypertension in upper extremities, diminished or delayed femoral pulses (brachial-femoral delay) and low arterial blood pressure in the lower extremities. The cardiac examination may be normal except for continuous murmurs from collateral vessels or systolic murmurs from coexisting defects.

Electrocardiographic (ECG) abnormalities vary with age and severity of the coarctation. In older

children and adults the ECG may show left ventricle hypertrophy. The diagnosis of coarctation is typically established with MR (or CT-) angiography or with TTE. MR-angiography clearly defines the location and severity of the coarctation as well as the collateral vessels.

The presented case report shows that chest radiograph also can contain vital clues for the diagnosis.

Timely diagnosis of the disorder is important. When untreated, mean survival is 35 years and mortality reaches 75% by the age of 46. Most frequent related causes of death are heart failure, aortic rupture and dissection, endocarditis and intracranial aneurysm with subsequent subarachnoidal or intracerebral hemorrhage. Reminding the latter, it is also strongly advised to perform MR of the brain at diagnostic work-up.

Treatment depends upon the severity of the coarctation, the patient's age and the clinical presentation. In adults the ACC/AHA recommend intervention when the peak-to-peak coarctation gradient is greater than or equal to 20 mmHg. In general, if the coarctation escapes early detection, repair should be performed at the time of actual diagnosis by surgery or balloon angioplasty and stenting.

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