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Infective endocarditis-endarteritis complicating asymptomatic aortic coarctation with a pseudocoarctation in an adult: A case report

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Abstract
Coarctation of the aorta is an obstructive aortic lesion that causes secondary hypertension. Diagnosis is sometimes difficult because patients could present no other symptom. Aortic coarctation determines a favorable anatomical condition for the development of endocarditis-endarteritis due to the presence of an alteration in blood flow dynamics that favors the appearance of endothelial damage and the adhesion of microorganisms. We present a case of a patient affected with a previously unknown aortic coarctation with high blood pressure, who developed infective endocarditis-endarteritis. The Physical examination and echocardiography clinical established the diagnosis. This case report underlines the importance of a complete echocardiography that includes the suprasternal view especially in young patients with a history of hypertension.

Keywords: aortic coartaction, infective endocarditis, echocardiography, suprasternal view

Introduction

The diagnosis of aortic coarctation is most often made during infancy and childhood, and only rarely in adulthood. Acquired cases have been reported, most cases are congenital and occur in about 4 of 10 000 live births [1]. The pathophysiology of aortic coarctation is largely unknown. Two theories exist and relate to (a) reduced intrauterine blood flow leading to underdevelopment of the aortic arch and (b) migration of ductal tissue into the wall of the aortic arch during fetal development [2]. The natural history of untreated coarctation is that of premature death from stroke and coronary heart disease or sudden death [3]. Endocarditis - Endarteritis in aortic coarctation is a rare entity at the present.

Case report

A 46 year-old men presented to hospital with a 2 weeks history of fever and night sweats. Him medical history included hypertension, for which he had been seen by a generalist and treated by an angiotensin converting inhibitor (10 mg twice daily) and hydrochlorothiazide (25 mg daily).
On physical examination, he was identified a grade 3/6 systolic murmur in the apex and left second intercostals space that was radiated to the intrascapula area. The femoral pulses were palpable bilaterally; however, a radial-femoral pulse delay was noted. The blood pressure was 190/100 mmHg in the left arm and 160/80 mmHg in the right arm with a systolic pressure gradient of 30 mmHg between upper and lower extremities.
Aortic coarctation was suspected, and a further investigation was performed. Twelve-lead electrocardiogram revealed left ventricular hypertrophy. A chest X-ray revealed inferior rib notching (Roesler sign). Laboratory tests revealed elevated neutrophils and the blood cultures were 3/3 positive for Streptococcus Species.

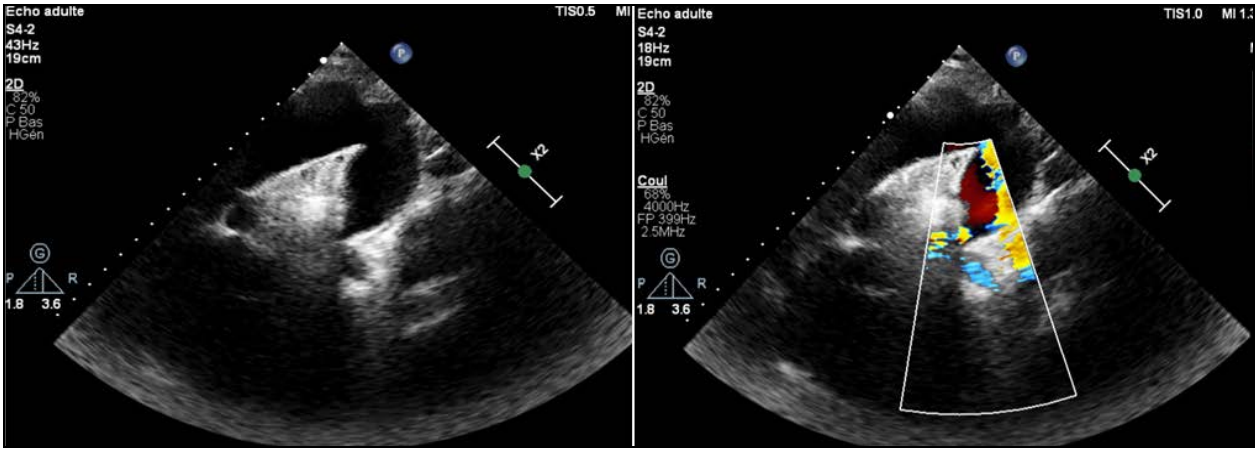

Fig 1: Transthoracic echocardiography suprasternal view 2D color. Aortic arch and descending aorta with turbulent flow across the stenotic postductal region and a poststenotic dilatation associated with elongation and kinking of the proximal segment of the descending aorta

A transthoracic echocardiography was requested showing a conserved systolic function (biplane Simpson 60%) and the cardiac valves were normal without any image suggestive of vegetation. The suprasternal view showed a turbulent flow

and a reduction in luminal caliber of the aorta (0.8 cm of diameter) (Figure1) below the origin of the subclavian artery accompanied by post-stenotic dilatation (4.1cm of diameter) and an elongation with kinking of the proximal segment of the descending aorta, while the continuous wave Doppler revealed a sharply elevated systolic peak with a diastolic velocity profile markedly concave, (Figure2) and the transcoarctation pressure gradient was estimated at 56 mmHg.

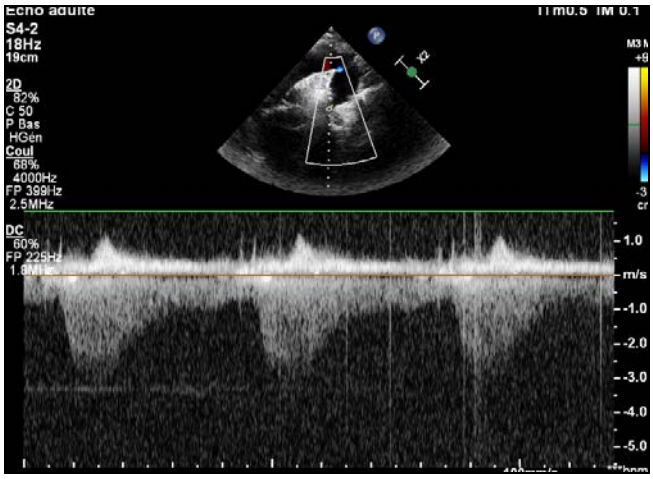

Fig 2: Continuous wave Doppler with a maximum gradient of 56 mmHg and diastolic prolongation flow, typical of aortic coarctation.

A strategy of complete intravenous antibiotic treatment with ceftriaxone and gentamicin was planned with a clinical and biological improvement by week 4. The patient was then referred to cardiothoracic surgery to evaluate her candidacy for surgical or percutaneous therapy.

Discussion

Coarctation of the aorta typically consists of a discrete, diaphragm-like ridge extending into the aortic lumen just distal to the left subclavian artery at the site of the aortic ductal attachment (the ligamentum arteriosum). This condition results in hypertension in the arms. Less commonly, the coarctation is immediately proximal to the left subclavian artery, in which case a difference in arterial pressure is noted between the arms [3]. Extensive collateral arterial circulation to the distal body through the internal thoracic, intercostal, subclavian, and scapular arteries frequently develops in patients with aortic coarctation [3].

Most adults with aortic coarctation are asymptomatic. The diagnosis is made during routine physical examination, in young patients with systemic arterial hypertension, with diminished or absent femoral arterial pulses. When symptoms are present, they are usually those of hypertension: headache, epistaxis, dizziness, and palpitations. Occasionally, diminished blood flow to the legs causes claudication [3].

Two thirds of patients over the age of 40 years who have uncorrected aortic coarctation have symptoms of heart failure. Three fourths die by the age of 50, and 90 percent by the age of 60 [4, 5].

Aortic coarctation is responsable of an endothelial stress damage that favors the adhesion of germs and formation of vegetations. It is an example of congenital malformation with a high risk of development of endocarditis-endarteritis. The hemodynamic stress produced by the high velocity jet through the stenosis could cause dilatation of the post-stenotic aorta and damage at the level of the vascular endothelium favoring the growth of microorganisms, especially in the region of low pressure [6]

At present the endocarditis in aortic coarctation is a rare entity, much more frequent on the aortic valve, especially in case of the frequent association of bicuspid aortic valve [7]. The germs related to endarteritis are similar to the microorganisms that cause infective endocarditis, the most frequent being: Staphylococcus sp, Streptococcus sp, Salmonella sp, Escherichia coli, and the HACEK group [8].

The CT scan or magnetic resonance imaging (MRI) constitutes the chosen methods for aortic coarctation evaluation [6]. However, echocardiography is still fundamental for the diagnosis of the coarctation and associated complications. The use of the suprasternal view in the TTE should be carried out routinely in all echocardiographic studies, and it offers a useful vision of the aortic arch and descending aorta. It showed the narrowing of the descending thoracic aorta along with the increase in the Doppler flow velocity and especially diastolic prolongation of forward flow. With TEE it is possible to carry out a detailed morphological study of aortic coarctation and the associated complications such as infective endarteritis or poststenotic aneurysmatic dilatation corresponding to mycotic aneurysm [3].

Surgical traitement should be considered for patients with a transcoarctation pressure gradient of more than 30 mmHg. Although balloon dilatation is a therapeutic alternative, the procedure is associated with a higher risk of subsequent aortic aneurysm and recurrent coarctation than surgical repair [9].

The incidence of persistent or recurrent hypertension after surgery, as well as the survival rate, is influenced by the patient's age at the time of surgery. The patients who undergo surgery after the age of 40 years, half have persistent hypertension, and many of those with a normal resting blood pressure after successful repair have a hypertensive response to exercise. Similarly, survival after repair of aortic coarctation is also influenced by the age of the patient. After repair during childhood, 89 percent of patients are alive 15 years later and 83 percent are alive 25 years later. When repair of coarctation is performed when the patient is between the ages of 20 and 40 years, the 25-year survival is 75 percent. When surgery is performed in patients more than 40 years old, the 15-year survival is only 50 percent [4, 10].

Conclusion

Aortic coarctation endocarditis-endarteritis is a rare entity. The routine use of a systematic echocardiography especially the suprasternal view study, allows an adequate vision of the aorta, making it possible to diagnose the coarctation of the aorta that could be missing in other cases.

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Conflict of interest

The authors declare that there are no conflicts of interest.

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