An Unexpected Cause of Resistant Hypertension in the Elderly: Aortic Coarctation

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Abstract

A 68-year-old female patient presented with complaints of dyspnea and weakness in her legs, which had persisted over a period of two months, and intensified when she walked. Her blood pressure, measured in both arms, was high in spite of four the antihypertensive drugs that she was taking and a blood pressure difference of an 80 mmHg was observed between the upper and lower extremities. Echocardiography revealed bicuspid aorta with moderate aortic and mitral valve insufficiency. Cardiac catheterization performed via right femoral artery failed; thus a catheterization via right radial artery was performed which disclosed an image resembling an interrupted aorta. Following thoracic computed tomography, a severe aortic coarctation was seen, and the patient was referred for surgical repair.

Key words: Aortic coarctation, advanced age, resistant hypertension.

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Introduction

Aortic coarctation is one of the most frequently observed congenital cardiac diseases and has been defined as a stenosis in a segment of the aorta (1). This stenosis is just distal to where the left subclavian artery branches off, and right across from the insertion of ductus arteriosus to the aorta in 98% of cases (2). The incidence of aortic coarctation is 1/2500 live births, and is seen twice as often in men than in women (3).

Although some cases of familial and genetic mutations have been published, the underlying mechanism has not been clearly understood yet. On the other hand, it is known that a developmental defect in the fourth and sixth aortic arches during the embryonic period lies at the bottom of the disease, and the suggested theories for underlying mechanisms have impaired blood flow, abnormal migration of ductal tissue and abnormal effect of vascular endothelial growth factor. However, these theories do not explain the development of some clinical situations (such as bicuspid valve, mitral valve abnormalities, and cerebral aneurysm) that may accompany aortic coarctation.

The diagnosis of aortic coarctation is performed with a clinical picture of variable degrees of heart failure changing according to the severity of the stenosis at the coarcted segment. Patients who reach adulthood may present with various complaints according to the degree of aortic stenosis and accompanying lesions. Patients may present with complaints secondary to hypertension since aortic coarctation frequently causes increased blood pressure and so it should always be considered in cases of secondary/resistant hypertension. Complaints may be in the forms of headache, weakness in lower extremities and cold legs. Occasionally, the first admission may be a backache associated with a clinical picture of shock due to aortic dissection, and unconsciousness due to intracranial bleeding. On the other hand, patients may totally be asymptomatic, and diagnosis may be as a result of high blood pressure or murmur.

Mortality is higher than 80% in untreated cases when the patient reaches the fifth decade of life and mortality is usually due to complications such as aortic rupture, heart failure, and intracranial bleeding.

Case Report

A 68-year-old woman presented to the cardiology outpatient clinic at the University of Cumhuriyet with dyspnea, headache, and weakness in her legs, which had persisted over a period of two months, and intensified when she walked. It was ascertained that the patient had been followed-up for hypertension for 20 years. She was on zofenopril 30 mg, hydrochlorothiazide 12.5 mg, amlodipine 10
mg and nebivolol 5 mg for hypertension. On physical examination, her blood pressure was 170/100 mmHg and 165/100 mmHg in the right and left arms, respectively and 90/50 mmHg in the right and left lower extremities. A 3/6 systolic murmur was heard at mitral area and a 2/4 diastolic murmur at the aortic area. Electrocardiogram revealed a sinus rhythm and signs of left ventricular hypertrophy. Echocardiography performed with the diagnosis of aortic coarctation, disclosed a hypertrophic left ventricle, bicuspid aortic valve with moderate aortic insufficiency. A moderate mitral valve insufficiency in a degenerative structure was observed. Since an adequate image could not be obtained from the suprasternal window, the descending aorta and gradient could not be evaluated. The patient underwent a catheter procedure. During the intervention via right femoral artery, it was not possible to advance a 0,38 inch guideline to the distal part of the subclavian artery and the image obtained demonstrated that the contrast material had no passage to the proximal part (Figure 1). Catheter procedure via right radial artery revealed non-obstructing stenosis of the coronary arteries. Imaging at arcus aorta demonstrated that contrast material didn’t pass to the distal aorta (Figure 2) and an interrupted aorta was considered as the diagnosis and a computed tomography angiography (CTA) was requested for definitive diagnosis. CTA revealed an image compatible with a severe aortic coarctation immediately distal to the branching of the left subclavian artery at a level that can be defined as subatretic (Figure 3). Also, marked enlargement in the paravertebral and intercostal arteries were observed (Figures 4). Surgical correction was planned. On operating, the stenotic part was excised and the remaining defect was repaired with a graft.
Case Report

The treatment of the patient in the post-operation period was achieved in accordance with the guidelines. The arterial blood pressure, which could not brought under control despite multi-antihypertensive treatment before operation, was controlled thanks to zofenopril after operation (4).

Discussion

Aortic coarctation is a congenital abnormality that should be diagnosed and treated during the initial years of life. It is a correctable cause of hypertension in adults. Life expectancy is low in untreated cases with a mean survival is 34 years and mortality is generally due to heart failure, aortic dissection, infective endocarditis, and intracranial bleeding. Ninety percent of unrepaired cases die before they reach 50 years old and 5% of the cases die between 50 and 60 years of age (5). Very rarely, a number of cases have been reported to reach advanced age (6,7).

The cause of hypertension has not been clearly established in patients with aortic coarctation; however, an impaired autonomic nervous system and endothelial function and increased activity of the renin angiotensin system have been attributed. The number of antihypertensive drugs used in such cases is decreased following surgical or endovascular repair of the aortic coarctation and blood pressure control has been provided in a great majority of the patients (8). The case presented here was a patient of advanced age with no control of hypertension in spite of four antihypertensive drugs that belonged to four different groups of antihypertensive drugs in appropriate doses and we detected a severe aortic coarctation. Since the number of patients with aortic coarctation who reach advanced age are very unusual, the treatment approach for this group of patients is unclear. In this present case, we decided that her aortic coarctation should be repaired surgically since she had complaints that were considered to be due to aortic coarctation and had resistant hypertension.

End-to-end anastomosis, graft interposition, graft aortoplasty and subclavian flap angioplasty are among the methods used in the surgical treatment of aortic coarctation. Currently, angioplasty and stenting procedures directed to the coarcted area as alternatives to surgical treatment have also been used successfully in experienced centers. Results have demonstrated the superiority of stent placement to balloon angioplasty although there are no randomized studies (9). The case presented here was considered unsuitable for endovascular treatment and thus was referred for surgical treatment. A graft repair was successfully applied in this case.

In conclusion, whatever the age of the patient, one should be carefully consider aortic coarctation in cases with resistant hypertension.

References