

## Coarctation of the Aorta Associated with Left Subclavian Artery Aneurysm: A Case Report

Kaan Inan, MD, Onur S. Goksel, MD, Ibrahim Alp, MD, Tuncay Erden, MD, Melih H. Us, MD, Ahmet T. Yilmaz, MD

Department of Cardiovascular Surgery, Gulhane Military Academy of Medicine, Haydarpasa, Istanbul, Turkey

### ABSTRACT

Aneurysm of the left subclavian artery (LSA) in association with coarctation of the aorta (CoAo) is a rare phenomenon, especially in the younger population. A 19-year-old male patient was admitted for lower extremity varices and diagnosed to have severe CoAo and a 45-mm LSA aneurysm after digital subtraction angiography following detection of nonpalpable lower extremity pulses on physical examination. Corrective surgery was performed from a left posterolateral thoracotomy through the 4th intercostal space, and a discrete ring-like coarctation tissue was observed in the aorta just below the level of the LSA orifice. Complete excision of the coarctation tissue was followed by aortoplasty with a Dacron patch. Additionally, the subclavian aneurysm was completely excised and a 10-mm Dacron tube graft interposition was performed. Prompt diagnosis and surgical treatment in particularly hypertensive patients precludes significant mortality and morbidity following a possible rupture.

### INTRODUCTION

Aneurysm of the left subclavian artery (LSA) in association with coarctation of the aorta (CoAo) is a rare phenomenon, especially in the younger population [Hiller 2004; Bahcivan 2006]. Occasional reports have been presented from the adult population, and aortic/aneurysmal complications were suggested to occur in less than 3% of the patients with coarctation under the age of 20 [Oliver 2004]. We present a 19-year-old male patient with CoAo associated with a LSA aneurysm.

### CASE REPORT

A 19-year-old male patient was admitted for lower extremity varices. Upon physical examination, he was severely

hypertensive and his lower extremity pulses were nonpalpable. A plain chest radiogram showed intercostal notching and a pale, nonspecific opacification of the left superolateral aspect of the aortic arch (Figure 1). Upper extremity pulses were palpable and left arm pressure was 50 mmHg higher than in the right arm. Electrocardiography was consistent with left ventricular hypertrophy and sinus rhythm. Digital subtraction angiography demonstrated severe CoAo and a 45-mm LSA aneurysm (Figure 2).

A left posterolateral thoracotomy from the 4th intercostal space was performed for surgical exposure. Upon aortotomy, a discrete ring-like coarctation tissue was observed in the aorta just below the level of the LSA orifice. Complete excision of the coarctation tissue was followed by aortoplasty with Dacron patch. Additionally, the subclavian aneurysm was completely excised and a 10-mm Dacron (Gelweave; Sulzer Vascutek, Renfrewshire, Scotland, UK) tube graft interposition was performed. The patient was extubated at the postoperative 2nd hour and discharged on day 6 after an uneventful postoperative period on antihypertensive medication.

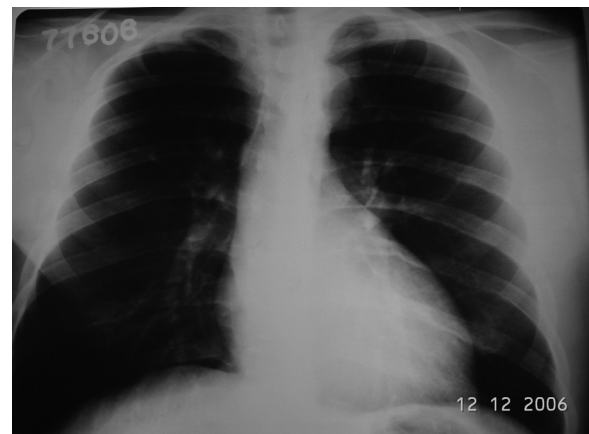


Figure 1. Plain chest x-ray of the patient with left subclavian artery associated with coarctation of the aorta. Note the intercostal notching and the pale opacification of the left upper aspect of the aortic arch.

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Correspondence: Dr. Onur S. Goksel, 4. Gazeteciler Sitesi, C3 Blok, Da: 16, 1. Levent, Istanbul, Turkey; fax: 90-212-534-22-32 (e-mail: [onurgokseljet@gmail.com](mailto:onurgokseljet@gmail.com)).

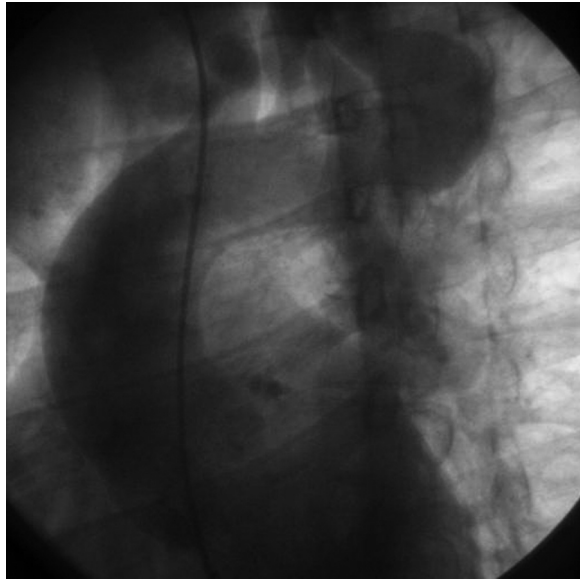


Figure 2. Coarctation of the aorta and the left subclavian artery aneurysm.

## DISCUSSION

Coarctation of the aorta constitutes approximately 7% of patients with congenital heart disease [Campbell 1970; Hiller 2004]. Isolated aneurysms of the subclavian artery may be as rare as 2 cases in 1488 patients [Dent 1972] and are usually associated with atherosclerosis or thoracic outlet syndrome. Aneurysms associated with coarctation, however, involve the aorta itself or are related to high pressure proximal to the coarctation if they are not mycotic. In this aspect, a true subclavian artery aneurysm associated with CoAo is an especially rare entity in the adolescent/young adult population [McCollum 1979; Hiller 2004; Bahcivan 2006]. Earlier series presented by McCollum et al demonstrated this rare association [McCollum 1979]. In their series, only 2 of 15 patients with subclavian artery aneurysm presented with CoAo. It is noteworthy that our patient was asymptomatic in regard to

coarctation and the subclavian aneurysm although the initial blood pressure difference between upper and lower extremities was approximately 100 mmHg. Only 30% of patients that McCollum et al presented were asymptomatic.

Typical location of the coarctated segment is distal to LSA [Hiller 2004; Bahcivan 2006]. Coarctation tissue in our patient was, however, very close to the subclavian branch-off, slightly proximal to those of previously described cases, and resulted in a very limited amount of space for proximal clamping. A partial bite on the left carotid artery was therefore unavoidable provided that the flow was not disturbed. This close relationship of the LSA with the coarctation tissue may explain the pressure gradient between the 2 arms. As a result, the mechanism for aneurysmal dilatation in our patient was probably the sheer stress of rapid pulsatile flow directly into the LSA, resulting in significant turbulence rather than simply high pressure.

In conclusion, LSA aneurysm associated with CoAo is a rare entity and may result in significant morbidity/mortality. Prompt diagnosis and surgical treatment in particularly hypertensive patients such as ours precludes the significant risk of rupture and compression of adjacent structures usually observed in these patients.

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