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Inflammatory Aneurysm of the Descending Aorta: A Case Report

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ABSTRACT

We report a rare case of an inflammatory descending aneurysm. At surgery, the patient had multiple aneurysms on the descending aorta. Histology of the specimen demonstrated an infiltration of chronic inflammatory cells in the aortic media.

INTRODUCTION

An inflammatory aneurysm is rare in the descending aorta. We present a case of a 73-year-old woman with multiple descending aneurysms that were pathologically diagnosed as inflammatory aneurysms.

CASE PRESENTATION

A 73-year-old Hispanic woman without any previous medical history found an abnormality on chest x-ray. CT scan of the chest demonstrated a saccular descending aneurysm just distal to the left subclavian artery (Figure 1). The size of the abdominal aorta was within normal limits. She had been asymptomatic and denied any previous history of infection, trauma, weight loss, or fever. She also denied having a smoking history and reported that there were no family members with an aneurysm. The pulse was equal on the left and right, white blood cell counts were normal, and the syphilis panel was negative. The patient underwent cardiac angiography, which demonstrated a normal coronary artery, and there was no stenosis of the arch vessels. The aneurysm was located in the lesser curvature of the proximal descending aorta without involvement of the left subclavian artery. The patient underwent surgery with a diagnosis of the descending aneurysm.

After intubation with a double-lumen endotracheal tube, left thoracotomy was performed, and the fourth rib was resected to facilitate exposure. After heparinization, the left femoral artery and vein were cannulated. A vent tube was placed at the apex of the heart. Cardiopulmonary bypass was initiated and the patient cooled to 18°C. A saccular aneurysm with a diameter of 7 cm was found at the lesser curvature of the descending aorta just below the left subclavian artery, and involved one third of the aortic circumference. Three other scattered small aortic aneurysms (1-2 cm) protruding from the descending aorta were observed (Figure 2). The aorta between these aneurysms appeared intact, and there was no atherosclerosis or calcification. Under circulatory arrest, the saccular aneurysm was opened and found to be a true aneurysm with a 3-cm orifice at the base communicating to the thoracic aorta. Careful examination of this area demonstrated an absence of atherosclerosis in the rest of the descending aorta. The anterior wall of the aneurysm was excised; then a dacron patch was tailored and sewn to the edge of the aorta with 3-0 prolene sutures. Other small descending aortic aneurysms were excluded with multiple pledgeted stitches. The patient was rewarmed, the pump was discontinued, then both cannulae were removed. Postoperative recovery was complicated with pneumonia, and the patient was transferred to a long-term facility for further rehabilitation.

The pathology specimen of the aneurysm demonstrated infiltration of the chronic inflammatory cells into the media, which is consistent with the diagnosis of an inflammatory aneurysm (Figure 3). The majority of infiltrated cells were lymphocytes and scattered plasma cells. There were no giant cells observed. The specimen was negative for bacteria by Gram stain, fungi by Grocutt stain, or acid fast organism by Zeihl-Neelsen stain. Cultures from the aortic wall for detection of bacteria did not grow any organism.

DISCUSSION

Inflammatory aneurysm was first described by Walker in 1935 and is commonly observed in the abdominal aorta [Walker 1972]. Approximately 3% to 10% of abdominal aortic aneurysms are inflammatory aneurysms [Tang 2005]. It is a woman-dominant disease, and the mean age of the occurrence ranges from 62 to 68 years. Risk factors for inflammatory abdominal aortic aneurysms include smoking and family history of aneurysms [Tang 2005].

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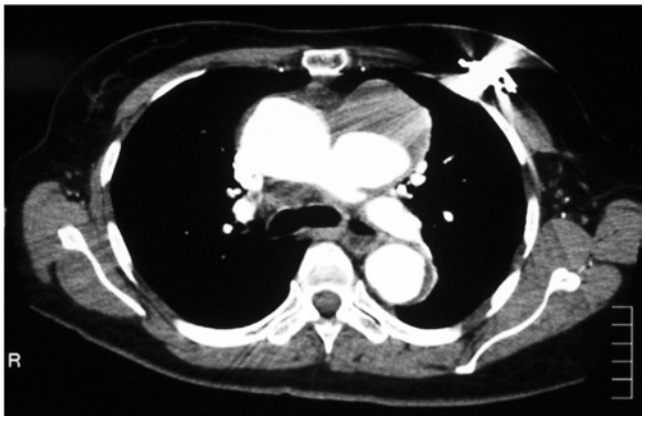

Figure 1. Enhanced CT scan of the chest shows a saccular descending aortic aneurysm just distal to the left subclavian artery.

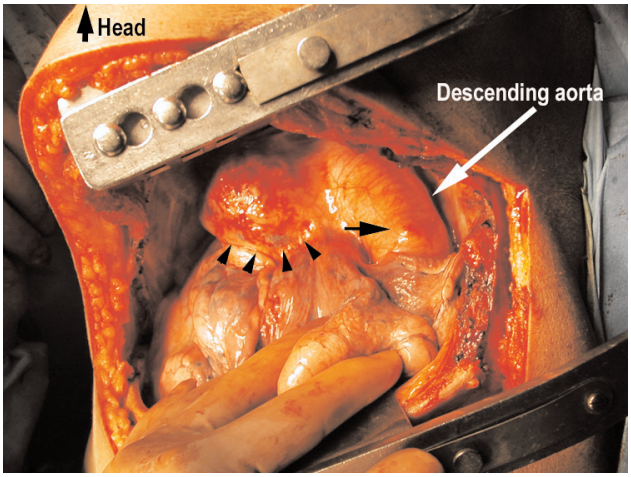

Figure 2. Intraoperative photograph shows a large saccular aneurysm (short arrows) and small aneurysms (long arrow) in the descending aorta.

However, an inflammatory aneurysm in the thoracic aorta is extremely rare and only a few have been reported. In 1985, Crawford reported 5 cases of inflammatory aneurysms in the descending aorta [Crawford 1985]. All 5 of these were associated with infrarenal abdominal aortic aneurysms. An isolated inflammatory aneurysm in the ascending aorta was first reported in 1997 [Connery 1994]. The first successful repair of inflammatory aneurysms in the ascending and aortic arch was reported by Girardi [Girardi 1997]. Both of the reported aneurysms densely adhered to surrounding tissue and the aortic wall was markedly thickened. Pathologic examinations of the aneurysm showed inflammatory infiltrates to the media without any remarkable atherosclerotic intimal changes. Reports did not find any clear etiology of inflammatory thoracic aneurysms, although the histology mimicked the Takayasu aortitis [Burke 1998].

The inflammatory aneurysm in our case was confirmed by pathology. A preoperative CT scan did not show any signs of an inflammatory aneurysm, such as the "halo or enhancing ring" sign [Tang 2005], which may be explained by the little inflammatory change observed during the surgery. Previous reports of an inflammatory thoracic aneurysm also indicate a lack of the halo sign; thus the inflammatory process of the thoracic aorta may be different from the abdominal aorta. Preoperative MRI may provide additional information of the local inflammatory process [Tennant 1993]; however, the patient did not have one.

Major aortic manifestations of Takayasu disease involve occlusive diseases of the major branches of the aorta; however, 10% to 45% of patients with Takayasu disease may present with a thoracic, abdominal, or thoracoabdominal aortic aneurysm [Kieffer 2004]. The aneurysm is more often fusiform than sacciform, and sometimes multiple. Takayasu disease is more common in Asia and South American countries, and more commonly found in young women. The histology of these aneurysms associated with Takayasu disease is

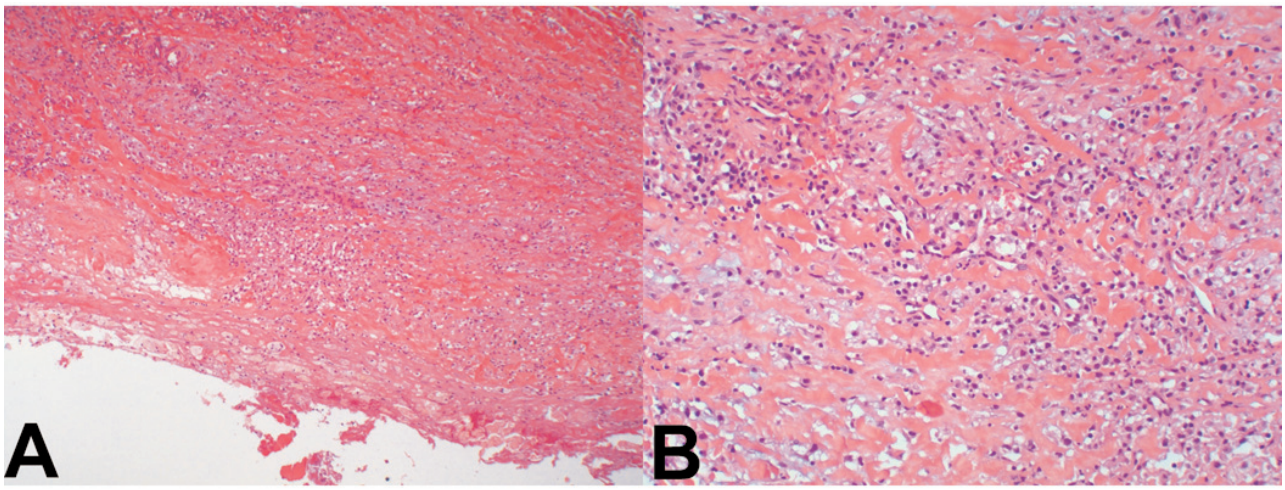

Figure 3. Pathological examination shows infiltration of chronic inflammatory cells into the media. Hematoxylin-Eosin stain. (A) Original magnification ×4, (B) original magnification ×10.

characterized by chronic medial inflammation with giant cells and adventitial scarring [Burke 1998]. The histology of our patient was similar, but there were no apparent giant cells.

Mycotic aneurysm may involve the thoracic aorta, and may present with multiple aneurysms [Miller 2004]. Signs of previous infection were absent in our patient, and both the tissue culture and the surgical specimen were negative for any organisms. Syphilic aneurysm may also present with a thoracic aneurysm; however, this was ruled out in our patient by serological testing. Aneurysms associated with Bechet syndrome were also excluded in our patient due to absence of oral or genital ulcer and ocular manifestation.

We performed open repair of the thoracic aneurysm because of the proximity to the left subclavian artery. Endovascular stent placement could have been an option for this patient, particularly in the area of the small aneurysms, if we had been able to detect these small aneurysms preoperatively [Brandt 2005]. Patch repair was chosen because it is a simple procedure, and because the rest of the aorta appeared grossly intact and lacked signs of atherosclerosis. The descending aorta, which might have been involved with inflammatory changes, could have been replaced with a Dacron graft; however that would have required extensive surgery including a longer pump run, longer arrest time, and reconstruction of intercostal arteries.

To our knowledge, an isolated noninfective inflammatory descending aortic aneurysm has not previously been reported. Further investigation may be necessary to understand the etiology of inflammatory descending aortic aneurysms.

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