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A Mediastinal False Aneurysm with Aortocutaneous Fistula

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ABSTRACT

In this report, we present a case of the development of a false aneurysm of the ascending aorta with an aortocutaneous fistula in a 57-year-old patient 10 months following aortic valve replacement and concomitant coronary bypass surgery.

INTRODUCTION

Mediastinal false aneurysm is a rare but life-threatening complication of thoracic aortic operation [Katsumata 2000]. The predominant predisposing factors included aortic graft infection, mediastinitis, dissection of the native aorta, degenerative aortic disease, and possibly tissue necrosis after excessive use of glue [Sakashita 1976, Coselli 1989]. We present a case of mediastinal false aneurysm with aortocutaneous fistula of the ascending aorta 10 months following aortic valve replacement and concomitant coronary bypass surgery.

CASE

A 57-year-old male patient had undergone 1 aortic valve replacement (Sorin Biomedica, Modena, Italy) and coronary bypass surgery with 4 saphenous vein grafts. A complication occurred in the postoperative period: purulent discharge of 2 weeks duration from the sternotomy incision, without fever. The patient had no history of previous antibiotic use before the admission. Because of restriction of the infection to the subcutaneous tissue and intact sternum, mediastinal involvement was not considered, but a computed tomographic scan was not performed to rule out fluid collection posterior to the sternum. The infection was finally controlled by superficial debridement of infected tissues and administration of antibiotics. No bacteria were identified in cultures of the debridement or the arterial blood cultures taken on a few occasions under the proper treatment without antibiotics. The early postoperative course was uncomplicated. The patient was discharged without signs of clinical infection on the 16th postoperative day. The sternum was tight on examination and wound healing was unremarkable.

The patient had been on warfarin with the international normalized ratio (INR) being maintained between 2.0 and 2.5. Four months after the operation, due to irregular use of warfarin (control INR was 1. 04) he had a cerebrovascular accident that resulted in hemiplegia. The control echocardiography showed normal prosthetic valve function without any abnormal findings.

Ten months after surgery, the patient was admitted to the hospital with bleeding from the incision line located on the jugular notch. The computed tomographic scan revealed a pseudoaneurysm related to the ascending aorta (Figure 1). Aortography showed a leakage from the ascending aorta to the false aneurysm (Figure 2). Laboratory studies showed an INR of 4.6. After general anesthesia, access to the right common femoral artery and vein was obtained, and the patient was cannulated before sternotomy. A long 32F venous cannula was advanced until the tip was positioned in the right atrium. Cardiopulmonary bypass was then established with an average low flow (2.5 L/min per m^2). The sternal reentry was undertaken at 32°C. Control of the false aneurysm was easy to establish, and there was no need for further cooling or establishment of total circulatory arrest. The general appearance of the mediastinal tissues resembled mediastinitis. It was found that an aneurysm was arising from the suture line of the proximal anastomosis of the right coronary artery–saphenous vein graft. We did not use teflon pledgets or foreign material for the aortotomy and proximal anastomosis. Surgical procedure was direct suture repair of the disrupted anastomosis. Control and repair of the false aneurysm were easy, and again there was no need for further cooling or establishment of total circulatory arrest. The pathologic examination of mediastinal tissue showed a nonspecific chronic inflammatory process. The postoperative period was complicated by sepsis, and the patient died on the 10th postoperative day.

DISCUSSION

Inevitably, reoperation for mediastinal false aneurysm with or without infection is associated with high mortality. The false aneurysms might be identified between 2 to 10 months after surgery [Sakashita 1976, Coselli 1989]. The mode of presentation may be insidious. Intermittent or persistent low-grade fever may be the only symptom in patients in whom

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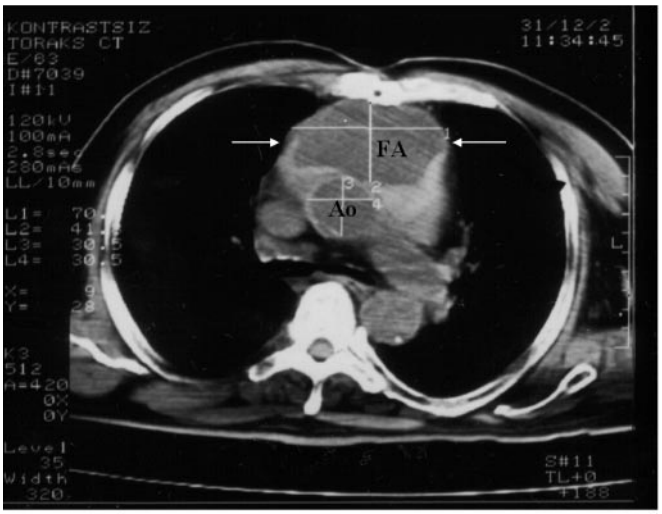

Figure 1. Computerized tomographic image of the mediastinum; arrow points to the large false aneurysm (FA) adjacent to the ascending aorta (Ao).

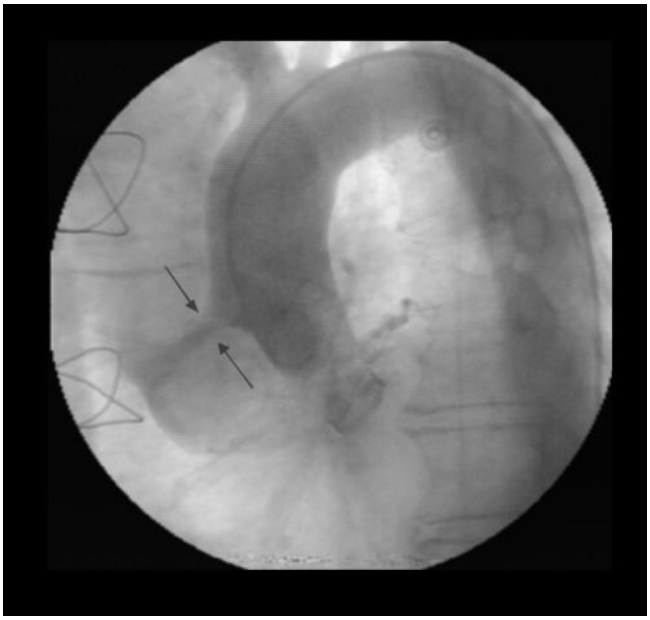

Figure 2. Aortographic image shows a leakage to the false aneurysm.

the false aneurysm has already occupied a part of the mediastinum. An expanding false aneurysm may also produce symptoms of cardiac tamponade because of the mass effect. Cerebral embolism from thrombus in the false aneurysm may be the only presentation. False aneurysms over anastomosis suture lines, between dacron grafts and the aorta, are rare but severe complications of prosthetic graft replacement of the thoracic aorta and require emergency reoperation.

In reviewed series, the incidence of anastomosis false aneurysm occurring between native aorta and prosthetic graft material ranged between 7% and 25% [Miguel 2000]. Development of anastomotic false aneurysm has been attributed to tension over the suture lines, which may be related to a pathologic condition of the aorta as well as infection and structural deterioration of prosthetic grafts and suture material.

The presentation of an aortocutaneous fistula from a false aneurysm is a very rare clinical entity that has previously been reported by Bridgewater [1990] and Miguel [2000].

Because of the high mortality rate associated with false aneurysm development, surgical procedure is advisable for all patients. In the case of a small communication between true and false lumen, direct suture repair (as in this case) may be considered. We believe that it was necessary to take immediate measures to prevent bleeding and avoid the graft replacement of the entire aorta as much as possible. In the case of a false aneurysm resulting from infection, resection of a part or entire graft and adjacent aorta is indicated, followed by long-term antibiotic therapy [Kawachi 2002, Bakker-de Wekker 1984]. The native aorta may be the origin of a mediastinal false aneurysm without a tube graft replacement [Bridgewater 1990].

Fatal or nonfatal hemorrhage may occur from any tissue or organ as a complication of anticoagulant therapy. The risk is known to be higher with INR levels above 4.5 [Cohn 1997]. Despite the lack of supportive evidence, a raised INR, such as in this reported case, may facilitate the development of a false aneurysm with an underlying chronic infectious process. The high INR and underlying smoldering mediastinitis might be the causes of mediastinal false aneurysm.

In conclusion, we advocate computed tomography as a diagnostic tool for the timely detection and elective repair of all false aneurysms after any cardiac operation with or without prosthetic graft in patients with a history of infection and suspicion of mediastinitis. Two-dimensional echocardiography may not be adequate.

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