

An Aneurysm at the Cannulation Site Discovered 40 Years after Cardiac Surgery: Report of a Case

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We report the successful surgical treatment of a pseudoaneurysm of the ascending aorta in a 45-year-old man who underwent surgical closure of a ventricular septal defect at the age of 5. A computed tomography scan ordered for the investigation of a pulmonary mass happened to detect a pseudoaneurysm (20 mm diameter). The pseudoaneurysm protruded anteriorly from the ascending aorta at the previous aortic cannulation site. The ascending aorta, including the lesion, was replaced with a prosthetic graft uneventfully. The cause of the pseudoaneurysm was considered iatrogenic, since he had no prior history of postoperative mediastinitis or blunt chest trauma. A computed tomography scan is a useful means to detect a mass on the ascending aorta following cardiac surgery, and it provides important information to help define a surgical strategy. (Ann Thorac Cardiovasc Surg 2008; 14: 267–269)

Key words: pseudoaneurysm, after cardiac surgery, congenital heart disease

Introduction

A postoperative pseudoaneurysm of the ascending aorta has been reported to occur in less than 0.5% of cardiac surgeries and to be associated with a high morbidity and mortality.¹⁾ A pseudoaneurysm can develop at various surgical sites, such as anastomotic suture lines, aortotomy, aortic cannulation, and aortic needle puncture sites. Infection of these sites is known to affect the wound healing process and predispose to pseudoaneurysm formation.^{2,3)} In this report, we present a case of a pseudoaneurysm of the ascending aorta at the cannulation site, which was discovered 40 years after the initial operation.

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Case Report

A 45-year-old man was referred to our hospital for investigation of a pulmonary mass. A computed tomography of the chest incidentally revealed an aneurysm of the ascending aorta that had a diameter of 20 mm (Fig. 1). The pulmonary mass was diagnosed as chronic inflammation of the lung. The physical and blood examinations were normal, and he had no significant previous medical history except for an operation for congenital heart disease at the age of 5. Surgical repair of a ventricular septal defect at that time was performed at another hospital. According to the medical chart obtained from that hospital, a patch closure of the defect was carried out under a cardiopulmonary bypass with cannulation of the ascending aorta for arterial inflow. His postoperative course was uneventful, and no infection was observed.

To correct the pseudoaneurysm, a median full sternotomy was carefully performed, and moderate adhesions in the pericardial space were dissected. The aneurysm of the ascending aorta was confirmed at the site of the previous aortic cannulation (Fig. 2), although no stitch was found around the lesion. A cardiopulmo-

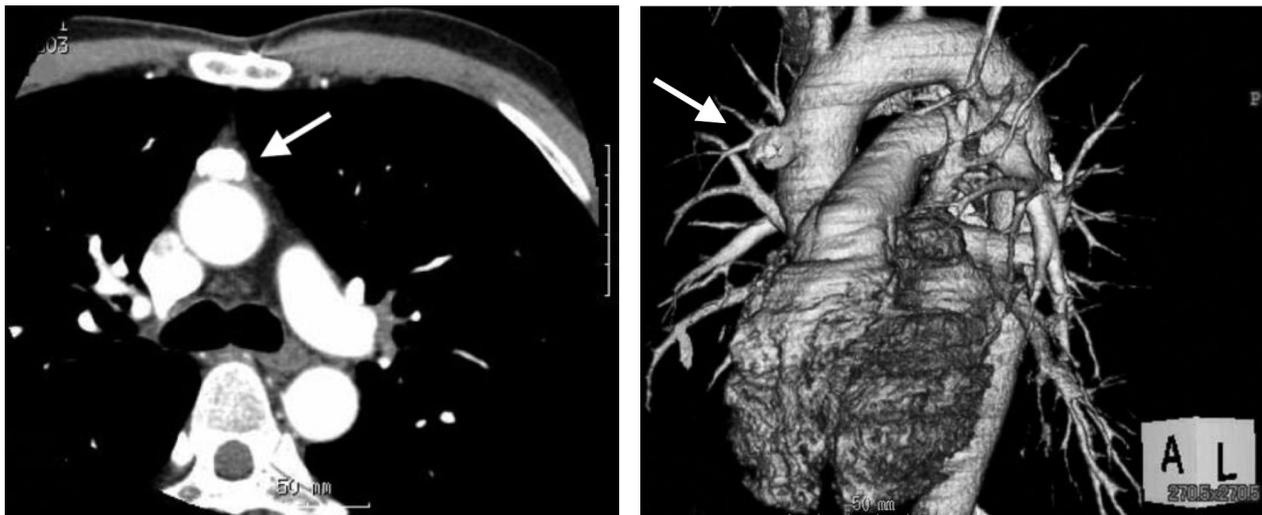


Fig. 1. A contrast-enhanced computed tomography scan and 3-dimensional computed tomography shows a 20 × 20 mm aneurysm of the ascending aorta (arrow).

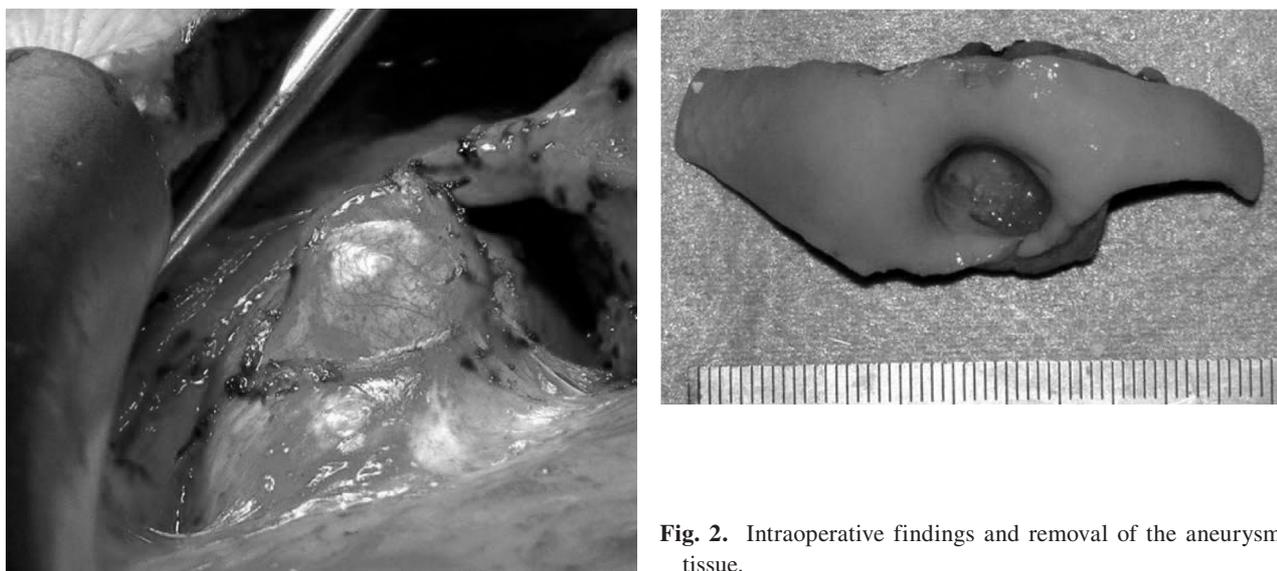


Fig. 2. Intraoperative findings and removal of the aneurysm tissue.

nary bypass was established following cannulation of the distal ascending aorta for inflow and the right atrium for drainage. The ascending aorta was replaced with a prosthetic graft during cardiac arrest. The patient was easily weaned from cardiopulmonary bypass, and his postoperative course was uneventful. A pathological examination revealed the absence of inflammatory cells in the ascending aorta. However, the arterial layer structure had collapsed and had been replaced by collagen fibers with focal calcium deposition.

Discussion

A postoperative pseudoaneurysm is a rare and sometimes life-threatening complication.^{1,4} The aortic cannulation site, needle puncture site, and coronary artery bypass grafting suture lines are reported to be potential locations. If there is improper closure of an aortic incision or breakdown of an aortic suture line, red cells and fibrin may leak into the surrounding connective tissue, resulting in a pseudoaneurysm.⁵⁻⁷ Furthermore, infection of these sites may play a pivotal role in pseudoan-

eurysmal formation.^{2,3} Symptoms such as pectoralgia, cough, dysphagia, and pulsatile mass may vary, depending on the location and size of the lesion.⁵⁻⁷ Dhadwal et al. reviewed their 10-year experience and identified 5 patients with a pseudoaneurysm of the ascending aorta following coronary artery bypass surgery.⁸ The median duration from the initial operation to pseudoaneurysm repair was 5 years. Two of the 5 patients had a prior history of sternal wound infection.

A repeat operation for a large pseudoaneurysm of the ascending aorta can be a surgical challenge. Sternal reentry by itself may cause fatal hemorrhage. The establishment of a cardiopulmonary bypass prior to sternotomy should be considered to prevent iatrogenic rupture by decompressing the pseudoaneurysm if it is so large that it bulges into the sternum. In the present case, since the mass was small and enough space was observed preoperatively in the anterior mediastinum for sternal reentry, resternotomy was performed without the use of a cardiopulmonary bypass. Thus computed tomography scanning has the advantage of imaging surrounding anatomic structures to help define a surgical strategy.

This case report highlights the occurrence of an asymptomatic pseudoaneurysm of the ascending aorta that was developed following cardiac surgery performed 40 years earlier. And a computed tomography scan is a useful means to detect a mass on the ascending aorta following cardiac surgery; it also provides important information to help define a surgical strategy.

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