

Surgical Repair of a Pseudoaneurysm of the Ascending Aorta after Previous Aortic Valve Replacement and Aneurysmorrhaphy

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Abstract

We report the case of a patient with a pseudoaneurysm of the ascending aorta. He was referred to our hospital because of chest pain and dyspnea. A preoperative diagnostic evaluation revealed a large pseudoaneurysm of the ascending aorta close to the proximal anastomotic site of the graft. During surgery, the pseudoaneurysm originated from an intimal defect in the aortic wall on the right side of the right coronary artery 1cm proximal to the suture line. Replacement of the ascending aorta was successfully performed (*Iranian Heart Journal* 2006; 7 (4): 57-60).

Key words: aortic pseudoaneurysm ■ aortic root replacement ■ Bentall operation ■ ascending aorta aneurysm

Aortic root replacement is a major surgical intervention. With modern grafting techniques, the hospital mortality varies between 1.7% to 17.1%.¹⁻⁹ The intraoperative mortality is higher when the operation is performed under emergency conditions because of acute dissection.⁷ A complication after Bentall operation (aortic valve and ascending aorta replacement) is the development of pseudoaneurysm, which is the result of suture line dehiscence in the aortic annulus, the coronary ostia, and/or the distal aortic suture line. Aneurysms of the ascending aorta are rare entities that may occur after cardiac surgical procedures and have a significant rate of complications. Surgical repair of ascending aorta pseudoaneurysm remains a challenge to surgeons.

We report the case of a patient with an ascending aorta pseudoaneurysm that was successfully repaired surgically.

Case report

A 43-year-old man with a previous history of AVR and supra-coronary ascending aorta replacement with a tubular dacron graft operation 13 years previously was admitted with dyspnea and palpitation from 2 months before. On physical examination, there was a moderate degree systolic and diastolic murmur at the 2nd left intercostal space. Clinical examination of the cardiovascular system, serial electrocardiograms, and cardiac enzymes were normal. A chest x-ray showed an enlargement of the ascending aorta (Fig. 1).

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Fig. 1. Chest X-ray depicting prominent ascending aorta.

Two-dimensional Doppler and trans-esophageal echocardiography showed a mild malfunction of the aortic prosthesis with mild to moderate insufficiency and aneurysm of the ascending thoracic aorta with a communicating neck to the aortic root. Angiography showed minimal coronary artery disease, and aortography revealed a huge aneurysm with a communicating neck to the aortic root as small as 1cm, located 1.5cm above the level of the double leaflet metallic valve. The aneurysm had blood flow and intraluminal clots and measured 9cm in the largest diameter (Fig. 2).



Fig. 2. Aortography depicting pseudoaneurysm.

The patient was scheduled for surgery. With the use of femoro-femoral bypass, a re-sternotomy was performed and the patient was cooled to 24°C. The pseudoaneurysm originated from an intimal defect in the aortic wall in the proximal aortic suture line (aorto-dacron suture line). A classic Bentall operation was performed for the patient. After rewarming, weaning from CPB was done with a cardiac pacemaker. The patient was discharged from ICU after 3 days. A control echocardiography in the early postoperative period showed no para-aortic leak.

Unfortunately, the patient developed complete heart block, and a permanent internal pacemaker was implanted for the patient (Fig. 3). The postoperative period was uneventful, and the patient stayed in the hospital for 29 days and was discharged without any problem.



Fig. 3. Postoperative chest X-ray.

Discussion

Pseudoaneurysms of the ascending aorta are a rare (<1%) but serious sequelae after

cardiovascular operations. They can occur in association with aortotomy, aortic cannulation sites, anastomotic suture lines, needle puncture sites, infection in peri-aortic area or in aortas with weak points (Marfan's syndrome).¹² However, a great percentage result from the mechanical rupture of aortic sutures, most commonly after surgeries on the aortic valve, coronary revascularizations (usually at the site of the proximal anastomoses).¹³⁻¹⁵ The major causes of pseudoaneurysms include technical error, acute dissection, native tissue degeneration, or deterioration of the graft or suture material.^{16,17} Most ascending aortic pseudoaneurysms are asymptomatic, unless they compress the adjacent structures. The risk of the rupture of a pseudoaneurysm should be taken into consideration as an indication for emergency surgery, especially in the case of large masses. From a surgical point of view, the treatment of ascending aorta pseudoaneurysms remains a challenge. Unintentional rupture during the redo sternotomy or mediastinal dissection due to the reduction in pressure around the formation when opening and sliding the sternum can cause surgical catastrophes. Mortality reported by several authors ranges from 29% to 46%^{18,19} and most of the time it is a consequence of a fatal hemorrhage due to the rupture of the pseudoaneurysm during surgical maneuvers for its repair.

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