The Heart Surgery Forum #2006-1206
10 (3), 2007 [Epub March 2007]
doi: 10.1532/HSF98.20061206

Online address: http://cardenjennings.metapress.com

Pseudoaneurysm of the Left Coronary Ostial Anastomoses as a Complication of the Modified Bentall Procedure Diagnosed by Echocardiography and Multislice Computed Tomography

Bilgehan Erkut, MD,[1] Münacettin Ceviz, MD,[1] Necip Becit, MD,[1] Fuat Gündogdu, MD,[2] Yahya Ünlü, MD,[1] Mecit Kantarci, MD[3]

Departments of [1]Cardiovascular Surgery, [2]Cardiology, and [3]Radiodiagnostics, Ataturk University Medical School, Erzurum, Turkey

ABSTRACT

We report the case of a patient with a pseudoaneurysm of the left coronary ostial anastomoses diagnosed 6 years after a Bentall procedure with coronary button anastomoses had been performed. Preoperatively, the pseudoaneurysm of the ascending aorta was diagnosed by transesophageal echocardiography and multislice tomography, and the diagnosis was confirmed by surgery. Intraoperatively, the dehiscence of the button anastomosis of the left coronary artery was determined. The operative technique for the repair of the left coronary anastomosis dehiscence was direct closure through a sternotomy using extracorporeal circulation. The patient was discharged on the twelfth day without problems. In conclusion, we demonstrated that the patient with a pseudoaneurysm after a conduit operation of the ascending aorta can be prediagnosed by using echocardiography and multislice tomography.

INTRODUCTION

The development of pseudoaneurysms of the ascending aorta is rare and may cause life-threatening complications, especially after composite graft surgery. Most ascending aorta pseudoaneurysms occur after surgeries on the aortic valve or coronary revascularizations and usually occur at the site of the proximal anastomoses of the grafts, aortotomies, or in the cannulation sites [Sequiera de Almeida 2001; Salzberg 2004].

Although the modified Bentall operation is associated with an extremely low incidence of anastomotic complications, particularly at the coronary ostia, coronary ostial complications such as stenosis, kinking, or pseudoaneurysm formation need to be assessed [Yakut 2001].

We report the case of a patient with a left coronary ostial anastomosis pseudoaneurysm that was diagnosed with transesophageal echocardiography (TEE) and multislice computed tomography (MSCT) and successfully surgically repaired.

December 7, 2006; accepted February 8, 2007.

Correspondence: Bilgehan Erkut, MD, Atatürk Bulvari, Eda Apartmani, Palandoken Tip Merkezi Ustu, Kat: 3, No: 3, 25080 Erzurum, Turkey; 90-533-745-10-06; fax: 90-442-316-63-40 (e-mail: bilgehanerkut@yahoo.com).

CASE REPORT

A 35-year-old man with characteristics of Marfan's syndrome underwent ascending aorta graft replacement (28-mm Dacron vascular graft; Sulzer Vascutek, Renfrewshire, Scotland) and aortic valve resuspension due to a type I aortic dissection 6 years ago. In the sixth postoperative month, he suffered an episode of chest pain, dyspnea, and palpitation. Advanced aortic regurgitation was determined in TEE. The patient had undergone a modified Bentall de Bono procedure with coronary button anastomoses using the flanged technique [Yakut 2001]. In the postoperative period, the patient had no problems and was discharged in 12 days with a prescribed treatment of orally administered anticoagulant. After 5.5 years, the patient sought medical assistance because of dyspnea, fever, and palpitation, and he was admitted with infective endocarditis to our clinic. TEE showed an aortic prosthesis functioning normally and a mass in the anterior portion of the ascending

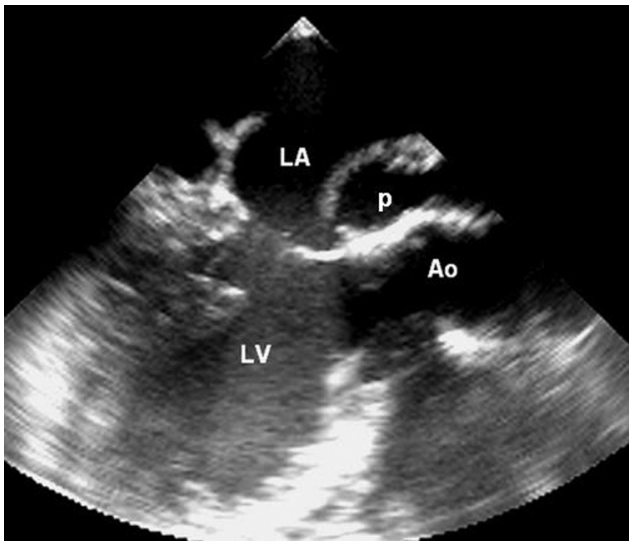

Figure 1. Transesophageal echocardiogram shows a pseudoaneurysm in a lateral view of the ascending aorta. LV indicates left ventricle; LA, left atrium; Ao, ascending aorta; p, pseudoaneurysm.

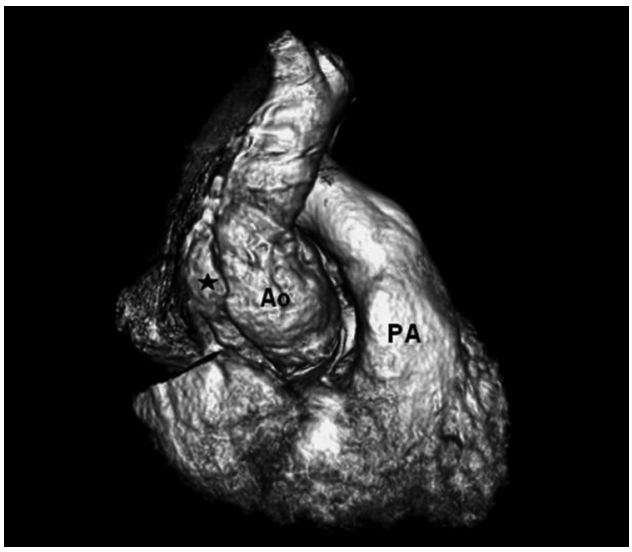

Figure 2. Multislice computed tomography depicting a pseudoaneurysm of the aorta (*). PA indicates pulmonary artery; Ao, ascending aorta.

aorta measuring 3 × 4 cm on its larger axis (Figure 1). This mass was evaluated as a pseudoaneurysm or false lumen. The localization and diagnosis of the mass was not clearly determined. A MSCT examination was performed to confirm the diagnosis and localization. MSCT showed a mass in the anterolateral portion of the ascending aortic graft (Figure 2). Because this mass was thought to be a pseudoaneurysm occurring after repair of acute aortic dissection, the patient was taken to the operating room. The patient underwent a median sternotomy. The pericardial adherents were excised. Extracorporeal circulation was established through the left femoral artery and the right atrium with a cannula of the superior vena cavae. Cold oxygenated hyperkalemic blood cardioplegia was used for myocardial protection. After the ascending aortic graft was displayed, the ascending aorta was cross-clamped, and cardiopulmonary bypass was routinely instituted. A mass was determined on the left coronary button anastomoses, distal of the ascending aortic graft. The ascending aorta was incised longitudinally. The dehiscence was determined on the left coronary button ostial anastomoses in 2 different sites, and diagnoses of a pseudoaneurysm was verified during surgery. The suture line dehiscences were repaired on the outside and inside of the ascending aorta using 6/0 prolene sutures, and surgery was completed. The postoperative period was uneventful, and the patient stayed in the hospital for 12 days. On routine follow-up, the patient was in excellent condition. At 8 months follow-up, he was free of complications and TEE revealed normal heart contractility, good function of the aortic valvular prosthesis, a regular ascending aorta, and no evidence of pseudoaneurysm.

DISCUSSION

Pseudoaneurysm of the ascending aorta is a rare entity (<1%) and results from complications of cardiac surgery when the ascending aorta is cannulated, incised, or anastomosed [Sabri 1991]. Most ascending aorta pseudoaneurysms occur after surgeries on the aortic valve or coronary revascularizations, usually at the site of the proximal anastomoses of the grafts, aortotomies, or in the cannulation sites.

Most ascending aortic pseudoaneurysms are asymptomatic, as in our case. However, if they compress important structures, such as coronary arteries, venous or arterial grafts, pulmonary arteries, or the superior vena cava, they may cause acute clinical manifestations. The risk of rupture of a pseudoaneurysm should be taken into consideration as an indication for emergency surgery, especially in the case of large masses [Sequeira de Almeida 2001].

From a surgical point of view, the treatment of ascending aorta pseudoaneurysms remains a challenge. The rupture risk during the redo sternotomy or mediastinal dissection is very important. Mortality rates were reported from 29% to 46% [Sullivan 1988; Razzouk 1993], and most of the time it is a consequence of a fatal hemorrhage due to a rupture of the pseudoaneurysm during surgical maneuvers for its repair. To avoid this situation, after the extracorporeal circulatory system was provided using femoral cannulation (both arterial and venous), a new sternotomy could be performed. In this way, a large loss of blood in relation to pseudoaneurysm ruptures during sternotomy is prevented. Besides, preoperative radiological techniques are extremely useful to determine the diameter of pseudoaneurysm, its site, and its relation to surrounding tissues. These techniques provided all details for surgical planning.

In conclusion, despite the evidence of some cases of ascending aorta pseudoaneurysm occurring because of infection or in aortas with weak points (Marfan's syndrome), a great percentage results from mechanical rupture of aortic sutures. A successful complete repair of ascending aorta pseudoaneurysms is very important in terms of avoiding the risk of fatal intraoperative bleeding. The reduction of operative risk and accurate planning of surgical tactics and technique should be based on a careful assessment of the results of examinations. The data obtained from the TEE and MSCT were confirmed by our surgical procedure. Our report indicates that a patient with a pseudoaneurysm of the coronary ostial anastomoses after a conduit operation of the ascending aorta can be prediagnosed by using TEE and MSCT.

REFERENCES

Razzouk A, Gundry S, Wang N, et al. 1993. Pseudoaneurysms of the aorta after cardiac surgery or chest trauma. Am Surg 59:818-23.

Sequeira de Almeida RM, Lima JD Jr, Kahrbek T, et al. 2001. Surgical repair of a pseudoaneurysm of the ascending aorta after aortic valve replacement. Arq Bras Cardiol 76:326-8.

Sabri MN, Henry D, Wechsler AS, et al. 1991. Late complications involving the ascending aorta after cardiac surgery. Am Heart J 121:1779-83.

Salzberg SP, Filsoufi F, Aklog L. 2004. Infected aortic pseudoaneurysm at the site of a proximal mechanical anastomosis connector following off-pump coronary artery bypass grafting: case report. Heart Surg Forum 7:E315-6.

Sullivan KL, Steiner RM, Smullens SN, Griska L, Meister SG. 1988. Pseudoaneurysm of the ascending aorta following cardiac surgery. Chest 93:138-43.

Yakut C. 2001. A new modified Bentall procedure: the flanged technique. Ann Thorac Surg 71:2050-2.