may interfere with the mechanical properties of the valves, in which case the occurrence of thrombosis may be facilitated.

An early case of prosthetic valve endocarditis could produce similar symptoms with high transvalvular gradients. However, our patient had no signs of systemic infection that could have suggested an infection of the bioprosthetic valve.

Available guidelines recommend aspirin for all patients with biological prosthetic heart valves and for those with no risk factors for thromboembolism [4]. After TAVI, it is common practice to prescribe antiplatelet therapy only, and our patient was receiving 100 mg aspirin per day at the time of discharge after the TAVI procedure. Still, a thrombosis developed on the bioprosthetic valve leaflets 7 months after TAVI. It is not clear whether the patient had a nonresponsiveness to the antiplatelet effect of aspirin before the treatment began. Because only a minority of the general population belongs to the group of aspirin nonresponders, it is not routinely controlled at our institution before therapy is started with aspirin.

In summary, one of the potential complications of TAVI is prosthesis thrombosis. Surgical aortic valve replacement may be the adequate solution for this problem when oral anticoagulation with warfarin fails.

References

Simultaneous Thoracoabdominal Aortic Aneurysm Repair and Coronary Artery Bypass Grafting Through Median Sternotomy

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Patients with thoracoabdominal aortic aneurysms (TAAA) often have severe ischemic heart disease. The determination of which condition to treat first is based on disease severity, but in some cases the conditions are equally severe. A 78-year-old woman received a diagnosis of a 59-mm TAAA and coronary artery stenosis. We performed simultaneous TAAA repair, using the patched aortoplasty method, and coronary artery bypass grafting (CABG) through a median sternotomy. No perioperative complications occurred, the patient was discharged in stable condition, and early follow-up visits were uneventful.


During traditional repair of a thoracoabdominal aortic aneurysm (TAAA), the descending thoracic and abdominal aorta is exposed through the stony incision, allowing for safe aortic reconstruction [1]. During the simultaneous performance of a cardiac surgical procedure, however, the stony incision does not provide an adequate field of view. Patients with TAAA often have complicated underlying cardiac disorders, such as ischemic heart disease. In such cases, simultaneous procedures on both the aorta and the heart may be desirable. Here, we report a case in which TAAA repair and CABG were performed simultaneously through a median approach.

A 78-year-old Japanese woman was referred to our hospital because of a gradual dilatation of her thoracoabdominal aorta. Her medical history was significant for hypertension. She had no lung disease. She was 151.6 cm tall and weighed 59.1 kg. Physical findings at the time of admission included a regular heart rate of 69 beats/min, blood pressure of 120/71 mm Hg bilaterally, and the absence of any heart murmur. Hematologic examination revealed the absence of anemia, normal platelet count, and normal liver and kidney function. Chest roentgenography revealed a mildly increased cardiothoracic ratio (0.54) and clear lung fields. An electrocardiogram showed sinus rhythm and no ST-T changes. Computed tomography (CT) of the chest revealed a type V TAAA extending from the descending aorta at T11 to the branching of the superior mesenteric artery, with a maximum diameter of 59 mm (Fig 1). Coronary angiography (CAG) showed 75% stenosis of left anterior descending (LAD) coronary artery at segments 6 and second diagonal branch and 90% stenosis of LAD at segment 7. The possibility of percutaneous intervention and thoracic endovascular aortic repair (TEVAR) was discussed, but (1) the coronary anatomy was considered unsuitable for this procedure, and (2) debranching TEVAR would have been required.

We thus chose to simultaneously perform the TAAA repair and CABG through a median approach. With the patient in the supine position, a median sternotomy and an upper laparotomy were performed. At the same time, the right femoral artery was exposed, and the great saphenous vein was removed. The liver was mobilized to the right upper side, and the triangular ligament and diaphragm were divided toward the aorta.
(Fig 2A). The TAAA was carefully exposed, avoiding injury to the esophagus. The transesophageal echocardiography probe was left in the transgastric position to assist in esophageal protection during posterior pericardial dissection. Cardiopulmonary bypass (CPB) was established with arterial inflow from the ascending aorta and the right femoral artery and venous drainage into the right atrium and left ventricular vent. The patient was cooled until her rectal temperature reached 20°C. The saphenous vein was anastomosed to the ascending aorta in an end-to-side fashion under partial clamping. The distal anastomosis was then fashioned to the second diagonal branch and the LAD coronary artery. After the proximal aorta was clamped and arterial inflow from the right femoral artery was stopped, the aneurysmal sac was opened. The anterior wall of the aneurysm wall was excised, leaving about one-third of the dorsal side. After reinforcement with a circumferential felt strip, a patched aortoplasty was performed with a one-branch Dacron graft (Fig 2B). Antegrade perfusion was initiated through the ascending aorta, and rewarming was started. The celiac artery was reconstructed with a branched graft. The operation time, CPB time, and aortic clamp time were 465 minutes, 191 minutes, and 64 minutes, respectively. The patient experienced no perioperative complications and was discharged on postoperative day 24. Postoperative CTs, performed 10 days and 18 months after the operation, demonstrated no dilatation of the patched aortoplasty site.

Comment

During traditional TAAA repair, the descending thoracic and abdominal aorta is exposed through the stony incision, allowing for safe aortic reconstruction [1]. During simultaneous performance of a cardiac surgical procedure, however, the stony incision does not provide an adequate field of view. Patients with TAAA often have complicated underlying cardiac disorders, such as ischemic heart disease. In such cases, simultaneous operations on both the aorta and the heart may be desirable. Several groups have previously reported performing TAAA repair during a simultaneous cardiac operation [2–4]. Notably, these procedures were all performed by left thoracolaparotomy. To the best of our knowledge, this is the first report of a combined TAAA repair and CABG using a median sternotomy and upper laparotomy. This approach has several advantages. First, the concomitant cardiac operation can be performed relatively easily. Second, CPB is easily established through a median sternotomy, thereby allowing for the management of hypothermia for spinal cord protection. Third, postsurgical pulmonary adverse events and respiratory depression occur less frequently after median sternotomy than after left thoracotomy. Of course, there are several disadvantages to this approach. First, it cannot be used to treat certain types of TAAA, such as the Crawford type II TAAA, because it is only possible to expose the lower thoracic descending aorta to the upper abdominal aorta above the superior mesenteric artery branch. It is especially very difficult to expose the aorta below the superior mesenteric artery because of the pancreas. Second, reconstruction of the intercostal arteries is technically difficult for the same reason. We chose to use a patched aortoplasty.
aortoplasty [5], which preserves all intercostal arteries and is thus advantageous for spinal cord protection.

The long-term results of patched aortoplasty remain controversial. Some groups have reported a late enlargement of the repaired site [6]. In our case, we observed no enlargement at 18 months after the operation. However, careful follow-up of aortic diameter is required.

In conclusion, a median sternotomy is an option for selected patients requiring simultaneous TAAA repair and a cardiac operation.

References

Postoperative Coronary Aneurysm Treated With Endovascular Coiling

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We present a rare case of aneurysm formation of the circumflex coronary artery after a Bentall procedure. Implantation of a stent graft in the circumflex artery and closure of the aneurysm neck failed. An endovascular procedure was used to coil the aneurysm and prevent rupture. Further recovery was uneventful. Angiography did not reveal flow in the aneurysmal sack 22 months after the procedure. To our knowledge, this is the first described case of coiling a postoperative coronary artery aneurysm with an almost 2-year follow-up.


Coronary aneurysms are an infrequent pathologic condition. Several series of patients show prevalence of the disease from 0.15% to 4.9% of angiograms [1]. Atherosclerosis is the most common cause of coronary aneurysms, accounting for more than 50% cases. Other causes include Kawasaki disease, other vasculitides, lupus erythematosus, connective tissue diseases, infections, trauma, and cocaine abuse. Iatrogenic formation of coronary aneurysm is almost exclusively associated with angiography or percutaneous coronary intervention, such as balloon angioplasty, stent implantation, directional atherectomy, or laser angioplasty. Some case reports describe postoperative coronary artery aneurysms; however, they are extremely rare [2].

A 33-year-old man was referred to the hospital because of a history of severe chest pain 2 weeks before admission. Computed tomography angiography revealed a dissection of the ascending aorta beginning 2 cm above the aortic valve and terminating at the level of the aortic isthmus. Echocardiography showed mild incompetence of the bicuspid aortic valve, normal contractility of the left ventricle, and no fluid in the pericardium. Owing to the patient’s stable condition, chronic phase of the dissection, and a history of acetylsalicylic acid treatment, he was qualified for delayed surgery. The patient was operated on 5 days later. The dissection was present in the ascending aorta, with the intimal tear 2 cm above the aortic valve; however, the coronary ostia were intact. Cold-blood cardioplegia was administered through the coronary ostia every 20 minutes. The Bentall procedure with button technique was performed using a 25-mm St. Jude Medical conduit (St. Jude Medical, Inc, St. Paul, MN). On the fourth postoperative day an ST-T segment depression was noted in leads V2 through V5, contractility decreased to 30%, and markers of myocardial infarction increased. Urgent computed tomography angiography revealed proximal closure of the circumflex artery and an aneurysm of 2 cm in diameter near the left main coronary artery bifurcation (Fig 1). Because a leak in an anastomosis of the left main coronary artery was suspected, a repeat sternotomy was performed; however, intraoperatively it was discovered that both coronary anastomoses were intact and tight. On the 12th postoperative day a dual-chamber pacemaker was implanted because of a persistent complete atrioventricular block. Two days later, an attempt was made to close the aneurysm with a stent graft, but this attempt failed. Direct fluoroscopic angiography revealed the entrance to the aneurysm approximately 1 cm distally to the left main coronary artery bifurcation. A repeated computed tomography angiography scan showed that the aneurysm

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