Simultaneous Open and Endoluminal Repair of Ruptured Abdominal and Thoracic Aortic Aneurysms: Report of a Case

IKUO SUGIMOTO1, TAKASHI OHTA1, HIROYUKI ISHIBASHI1, JUN KAWANISHI1, TETSUYA YAMADA1, TOSHIKI NIHEI1, MINORU HOSAKA1, and TSUNEI ISHIUCHI2

Departments of 1 Vascular Surgery and 2 Radiology, Aichi Medical University, 21 Karimata, Yuzako, Nagakute-cho, Aichi-gun, Aichi 480-1195, Japan

Abstract
A 66-year-old woman was transferred to our hospital for emergency treatment of a ruptured abdominal aortic aneurysm (AAA) and impending rupture of a descending thoracic aortic aneurysm (TAA) caused by a Stanford type-B dissection. She had severe coronary artery disease and a highly calcified aorta, and had been taking long-term steroids for rheumatoid arthritis. Endovascular repair of the TAA failed because the femoral artery was too small, so we performed simultaneous repair of the TAA and the AAA. A temporary axillofemoral bypass was constructed and the AAA was replaced with a bifurcated prosthetic graft. A thoracic stent graft was delivered successfully through a chimney graft of the abdominal graft. About 4 months later, the TAA extended proximally, causing hemoptysis, which was stopped by placing a new stent graft proximal to the previous one. This case report shows that a combination of open and endovascular repair is useful for treating a TAA with an AAA, especially in a small or frail patient.

Case Report
A 66-year-old woman experienced sudden abdominal pain, followed a short time later by back pain. The patient had a 16-year history of high blood pressure; the symptoms of a Stanford type-B aortic dissection and myocardial infarction had been noted more than 6 months earlier, and a coronary angiography had revealed triple-vessel disease. However, the patient had refused the recommended coronary artery bypass graft. She had also been taking long-term steroids for rheumatoid arthritis. The patient was small, being 147 cm tall and weighing 36 kg. On admission, she was fully conscious, her blood pressure was 108/66 mmHg, her pulse rate was 72 beats/min, and her body temperature was 36.6°C. We palpated a pulsating, tender mass, about 8 cm in diameter, in the mid-abdomen. Laboratory data included a blood hemoglobin level of 12.5 g/dl and a white blood cell count of 20,000/µl. An electrocardiogram revealed an abnormal recording characteristic of a posterior myocardial infarction. Computed tomography (CT) showed a dissected and ruptured aneurysm in the descending thoracic aorta and an infrarenal aneurysm with an impending retroperitoneal rupture (Fig. 1).

General anesthesia was induced and the patient was placed in the supine position. Stent-graft implantation was attempted in the descending thoracic aorta via a femoral artery approach, but because the iliofemoral artery was too small for a 20-F sheath to pass through, we performed the procedure by open access via the aorta. To reduce the load of the thoracic aorta at the time of abdominal aorta clamping, we constructed a temporary axillofemoral bypass. An abdominal median incision revealed that the AAA was covered with a yellow-white coating. The graft side branch was anastomosed to the main trunk of a woven Dacron bifurcated graft (14 × 7 mm), aneurysmectomy was performed, and the aorta was repaired by using this bifurcated graft replacement. The stent graft was maintained in the
thoracic aorta using (the graft side branch. This stent graft was constructed from six connected and self-expanding 20-mm Z-stents covered with a polyester graft (UBE graft, diameter 34 mm). A post-deployment aortogram demonstrated successful exclusion of the descending thoracic aorta (a,b), and a 65 x 60-mm infrarenal aneurysm with impending retroperitoneal rupture (c,d).

Fig. 1. Computed tomography showed a dissected and ruptured aneurysm, 52 x 50 mm in size, in the descending thoracic aorta (a,b), and a 65 x 60-mm infrarenal aneurysm with impending retroperitoneal rupture (c,d).

Fig. 2a–c. Computed tomography done 4 months postoperatively with contrast medium showed a ruptured aneurysm in the proximal fixation site.

Culture of the thrombus in the abdominal aneurysm grew *Staphylococcus hemolyticus* and *Streptococcus sanguis*. Intravenous antibiotic therapy was given for 3 weeks, followed by oral antibiotics. The aneurysm sac shrank, and no endoleak or migration was seen on a CT scan done 2 months postoperatively.

About 3 months after her operation, the patient felt a dull pain in the anterior chest and became febrile, with hemothorax developing 1 month later. Bronchopulmonary erosion was seen via a bronchofiberscopy, and a CT scan showed a ruptured aneurysm at the proximal fixation site (Fig. 2). We performed stent-