

Hybrid endovascular repair of a dissecting thoracoabdominal aortic aneurysm with stent graft implantation through the false lumen

Yoshiki Watanabe, MD, Toru Kuratani, MD, PhD, Yukitoshi Shirakawa, MD, PhD, Kei Torikai, MD, PhD, Kazuo Shimamura, MD, PhD, and Yoshiki Sawa, MD, PhD, *Osaka, Japan*

We report the first successful hybrid endovascular technique for treating a residual dissecting thoracoabdominal aortic aneurysm with a compressed true lumen in a 48-year-old man in whom multiple stent grafts were deployed through the false lumen. The first stage of the procedure involved debranching of the visceral vessels from the right external iliac artery. In the second stage, a Gore excluder iliac extender (W. L. Gore and Associates, Flagstaff, Ariz) was deployed through the false lumen of the left common iliac artery; then, a Powerlink bifurcated stent graft (Endologix, Irvine, Calif) was positioned at the false lumen of the abdominal aorta. Overlapping with this stent graft, three Gore TAG stent grafts were deployed upward toward the Dacron (DuPont, Wilmington, Del) graft implanted during a previous operation on the descending aorta. Subsequently, the patient had an uneventful postoperative course, with no complications at the 3-year follow-up. The successful results of our new hybrid endovascular technique suggest the feasibility and efficacy of stent graft implantation through the false lumen. (*J Vasc Surg* 2014;59:264-7.)

Although conservative medical management is typically preferred for patients with type A aortic dissection after successful operation and type B aortic dissection, some such patients have residual blood flow into the false lumen, leading to aortic aneurysmal dilatation.¹⁻³ With recent improvements in conventional open surgical techniques for these pathologies, satisfactory results have been reported^{4,5}; however, these conventional approaches remain associated with considerable mortality and morbidity, including paraplegia, respiratory disorders, and renal failure, particularly in elderly and high-risk patients.⁶

Endovascular surgery is an alternative less invasive treatment for residual dissecting aortic aneurysms.^{7,8} Unfortunately, the true lumen of the aorta may be too narrow to allow deployment of the stent grafts, rendering endovascular therapy nearly impossible. Here, we describe the midterm results of a successful hybrid endovascular technique that involved the implantation of multiple stent grafts through the false lumen of a residual dissecting thoracoabdominal aortic aneurysm with a compressed true lumen after surgery for an aortic dissection.

CASE REPORT

A 48-year-old man was referred to our hospital because of a rapidly dilating, dissecting thoracoabdominal aortic aneurysm.

From the Department of Cardiovascular Surgery, Osaka University Graduate School of Medicine.

Author conflict of interest: none.

Reprint requests: Yoshiki Sawa, PhD, Osaka University Graduate School of Medicine, Department of Cardiovascular Surgery, 2-2 Yamadaoka, Suita, Osaka 565-0871, Japan (e-mail: sawa@surg1.med.osaka-u.ac.jp).

The editors and reviewers of this article have no relevant financial relationships to disclose per the JVS policy that requires reviewers to decline review of any manuscript for which they may have a conflict of interest.

0741-5214/\$36.00

Copyright © 2014 Published by Elsevier Inc. on behalf of the Society for Vascular Surgery.

<http://dx.doi.org/10.1016/j.jvs.2013.07.101>

He had undergone three previous surgeries, including an abdominal aortic fenestration through a laparotomy for malperfusion of the visceral arteries at the onset of a type B aortic dissection 19 years previously, graft replacement of the descending aorta due to a dissecting aortic aneurysm 14 years previously, and an aortic root replacement and total arch replacement for a subsequent type A aortic dissection 9 years previously.

The patient was asymptomatic, without pain or dyspnea, on admission. He had well-controlled hypertension (systolic blood pressure <140 mm Hg; heart rate, ~60 beats/min) and medication-controlled asthma, along with chronic kidney disease (serum creatinine level, 1.5 mg/dL). A physical examination and genetic testing revealed no hereditary connective tissue disorders.

The residual dissecting aortic aneurysm was rapidly growing and extended from the 26-mm Dacron (DuPont, Wilmington, Del) graft anastomosed in the previous surgery to the aortic bifurcation, with a maximum aortic diameter of 55 mm at the thoracoabdominal level; therefore, surgical treatment was indicated. A preoperative computed tomography angiogram (CTA) revealed a compressed true lumen with a thin crescent shape (minimum size, 3 × 14 mm) in the axial view. The celiac trunk and left renal artery (LRA) originated from the false lumen, the superior mesenteric artery (SMA) originated from the true lumen, and the right renal artery showed narrowing with right renal atrophy. The aortic dissection extended from the previously constructed double-barrel anastomosis to the left common iliac artery (LCIA), with a distal fenestration at the abdominal aorta immediately proximal to the aortoiliac bifurcation and a small tear at the LCIA (Fig 1).

Considering that the previous surgery was performed through a thoracotomy and given the concurrent risk of paraplegia, a less-invasive endovascular treatment was considered more suitable than open surgery. Therefore, we planned a multistage hybrid endovascular procedure that involved debranching of the visceral vessels and deploying stent grafts through the false lumen for aneurysm exclusion.

Procedure. Transposition of the internal iliac arteries and debranching of the visceral vessels. Under general anesthesia with the patient supine, the SMA, LRA, the internal iliac arteries

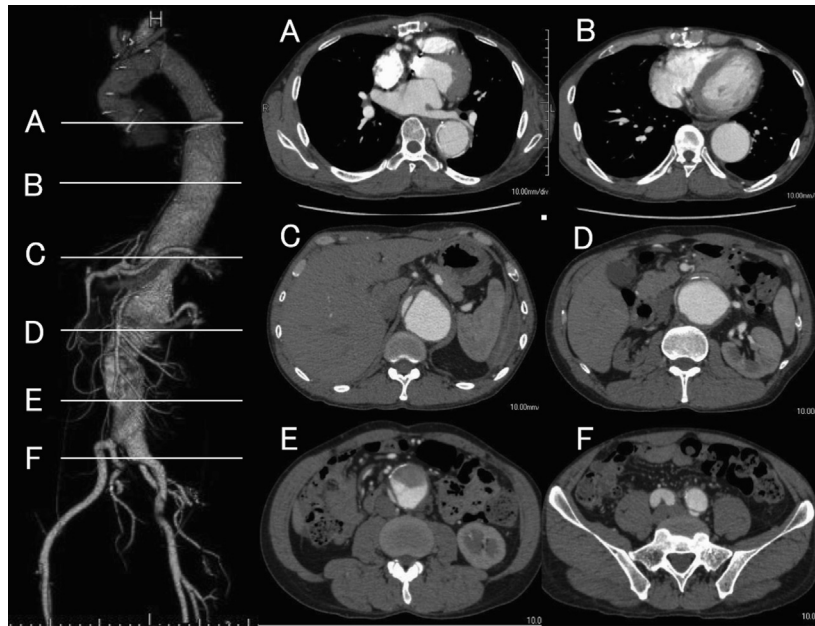


Fig 1. Preoperative computed tomography angiogram (CTA) shows aortic dissection extending from the double-barrel anastomosis of the previous surgery to the left common iliac artery (LCIA) with a very narrow true lumen. The right renal artery shows narrowing with renal atrophy because of low blood flow. **A**, The level of anastomosis; **B**, the midthoracic aortic level; **C**, the celiac trunk level; **D**, the left renal artery level; **E**, the midabdominal aortic level; **F**, the common iliac artery level.

(IIAs), and external iliac arteries (EIAs) were exposed through a midline abdominal incision (Fig 2, A). To maintain spinal cord perfusion, the IIAs were transposed distally onto the respective EIAs to avoid subsequent coverage by implantation of the stent graft. Preoperatively, a 6-mm ringed Gore-Tex graft (W. L. Gore and Associates, Flagstaff, Ariz) was anastomosed end-to-side to a 10-mm Hemashield graft (Meadox, Oakland, NJ). The Hemashield graft was then anastomosed to the right EIA, and the other side was anastomosed end-to-side to the SMA. Then, the 6-mm ringed Gore-Tex graft was anastomosed end-to-end to the LRA.

Revascularization of the celiac trunk was performed using a saphenous vein graft anastomosed from the Hemashield graft to the common hepatic artery. All the roots of the celiac trunk, SMA, and LRA were closed with polypropylene sutures using felt strips (Fig 2, B). After hemostasis and abdominal closure were achieved, the patient was admitted to the intensive care unit.

Stent graft implantation. The following day, endovascular stent graft implantation was performed in the hybrid operating room with concomitant cerebrospinal fluid drainage. Through a left femoral access, a 0.035-inch Radifocus guidewire (Terumo, Tokyo, Japan) was crossed over the distal fenestration of the LCIA and advanced into the ascending aorta through the false lumen of the abdominal and descending aorta and was then substituted with a stiff wire (Fig 2, B).

To compress the true lumen and secure the landing zone for the LCIA, the Gore Excluder iliac extender component (Gore Limb, PXL161207; W. L. Gore and Associates) was deployed at the LCIA through the distal fenestration (Fig 2, C). Similarly, a stiff wire was crossed over the distal fenestration of the abdominal aorta

through right femoral access and placed into the ascending aorta. A Powerlink 28-16-140BL bifurcated stent graft (Endologix, Irvine, Calif) was advanced into the false lumen of the abdominal aorta and deployed with its left leg overlapping the Gore limb, placed at the LCIA, and the right leg at the nondissecting right CIA. Then, two Gore TAGs (W. L. Gore and Associates) were inserted and deployed upward from the Powerlink body toward and into the previously implanted Dacron graft (Fig 2, D). Because the overlapping length of the two Gore TAGs was very short, a third Gore TAG was deployed in between these stent grafts to secure their attachment. Subsequent angiography revealed no endoleaks and patent blood flow into the celiac trunk, SMA, and LRA (Fig 3).

Postoperative course. The patient had an uneventful postoperative course, without spinal cord injury. Postoperative CTA revealed no endoleaks, with complete exclusion of the false lumen. CTA at the patient's 3-year follow-up did not reveal collapse or kinking of the stent grafts and only minor endoleaks from the left IIA and lumbar arteries; however, the dissecting aortic aneurysms showed no dilation on comparison with preoperative CTA images (Fig 4).

DISCUSSION

The standard concept of endovascular surgery for aortic dissection involves stent graft implantation into the true lumen, with elimination of the primary entry and fenestrations. In the acute phase, the true lumen, even if compressed, can be dilated after deployment of the stent graft. In contrast, in the case of a chronic dissecting aortic aneurysm with a compressed true lumen, the intimal flap becomes thickened and hardened; therefore, the true

Download English Version:

<https://daneshyari.com/en/article/5994928>

Download Persian Version:

<https://daneshyari.com/article/5994928>

[Daneshyari.com](https://daneshyari.com)