

# Non-Anastomotic Rupture of a Woven Dacron Graft in the Descending Thoracic Aorta Treated with Endovascular Stent Grafting

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The intrinsic structural failure of a Dacron graft resulting from the loss of structural integrity of the graft fabric can cause late graft complications. Late non-anastomotic rupture has traditionally been treated surgically via open thoracotomy. We report a case of the successful use of thoracic endovascular repair to treat a Dacron graft rupture in the descending aorta. The rupture occurred 20 years after the graft had been placed. Two stent grafts were placed at the proximal portion of the surgical graft, covering almost its entire length.

*Key words:* 1. Thoracoabdominal aortic aneurysm  
2. Dacron  
3. Rupture  
4. Endovascular procedures

## Case report

Dacron arterial grafts are widely used in thoracic aortic replacement, but few cases of non-anastomotic aneurysmal dilatation or rupture have been reported. In most cases that have been reported, knitted, rather than woven, Dacron grafts were used. We report the clinically successful result of thoracic endovascular repair (TEVAR) of the late rupture of a woven Dacron graft. The Dacron graft had been implanted in the patient's descending thoracic and upper abdominal aorta 20 years previously.

A 56-year-old man with a descending thoracoabdominal aortic aneurysm underwent descending thoracic and upper abdominal aorta replacement with a Hemashield 20-mm woven Dacron graft (Meadox

Medicals Inc., Oakland, NJ, USA) in 1992. He was followed up as an outpatient, and no adverse events were noted until 2009, when he presented with sudden-onset chest pain and severe dyspnea.

At that time, chest computed tomography (CT) revealed a massive right hemothorax, a large pseudoaneurysm around the implanted graft just above the diaphragm level, and marked contrast medium extravasation from the graft (Fig. 1). The patient underwent an emergency open thoracotomy, in which a disruption was found at the site of the anastomosis between the Dacron graft and lumbar intercostal arteries. The disrupted site was repaired with 2 layers of running sutures, and the graft was wrapped with the calcified aneurysmal sac.

In 2012, the patient presented with back pain, ab-

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**Fig. 1.** A chest computed tomographic scan from 2009 showing a massive right hemothorax and large pseudoaneurysm around the implanted graft and marked contrast medium extravasation from the graft.



**Fig. 3.** The arrow indicates multiple endoleaks from the graft, which were suspected to be due to a late Dacron graft rupture.



**Fig. 2.** A chest computed tomographic scan from 2012 showing a type III endoleak from the Dacron graft (arrow).



**Fig. 4.** A postoperative computed tomography scan showing the successful treatment of the suspected Dacron graft rupture.

dominal pain, and indigestion. A follow-up chest CT revealed that the size of the aneurysm in the descending aorta had increased in comparison with the findings of the previous CT examination. Dye collection in the space between the graft and native aneurysmal sac was also observed, and was suspected to be indicative of a late rupture of the Dacron graft itself (Fig. 2). The rupture was unrelated to the previous anastomosis or disrupted site.

Due to the high morbidity and mortality associated

with reoperation, we decided to perform thoracic endovascular stent therapy as an alternative to open thoracotomy for the late graft failure. The primary goal of using TEVAR was to cover the entire length of the Dacron graft in the descending aorta with a stent graft. The right common femoral artery was exposed under general anesthesia, and a guidewire and angiographic catheter were introduced through it. Aortic angiography revealed multiple dye leakages from the graft that were caused by late failure of the

Dacron graft (Fig. 3).

After obtaining an aortogram, two stent grafts (30×30×150 mm and 36×36×100 mm; S&G Biotech Inc., Seongnam, Korea) were also introduced through the right femoral artery and placed in the Dacron graft. The proximal end of the stent graft was deployed distally to the left subclavian artery, and the distal end was placed just above the celiac trunk. The total length of the thoracoabdominal aorta covered by the stent graft was approximately 220 mm. A postoperative CT scan showed that the disruption of the Dacron graft had been successfully treated (Fig. 4).

The patient was discharged with no procedure-related complications and, during the 1-year follow-up period, was free of any symptoms. However, he died of hepatocellular carcinoma 2 years later.

## Discussion

Dacron vascular grafts are known to be durable and effective as aortic vascular prostheses. However, a few cases of non-anastomotic aneurysmal dilatation or rupture of these grafts after implantation in the descending thoracic aorta have been reported. The probable cause was degeneration over time of the graft fibers or the round black yarn used as the guideline [1]. Intrinsic graft failure of Dacron grafts is a rare complication (0.5%–3%); and in most reported cases, knitted, not woven, Dacron grafts had been used [2,3].

In our case, woven Dacron graft rupture occurred 20 years after the initial operation, probably caused by the degeneration of graft fibers over a long time. Although woven Dacron graft rupture is extremely rare, reoperation is inevitable when it does occur. Traditionally, late graft failure has been treated surgically through open thoracotomy. However, the hospital mortality after aortic reoperation remains high (8%–15% in many reports), and is even higher (25%–50%) among patients receiving urgent or emergency

care [4,5].

TEVAR is increasingly being used for descending aortic diseases as a safe and feasible alternative to open graft repair. In light of the high morbidity and mortality associated with reoperation, we decided to perform endovascular therapy as an alternative management strategy for late graft failure in our patient.

To the best of our knowledge, the endovascular repair of primary graft rupture in a woven Dacron graft has not been reported. The case presented here demonstrates the effectiveness and feasibility of TEVAR implantation to treat the non-anastomotic rupture of a Dacron graft after descending aortic replacement.

## Conflict of interest

No potential conflict of interest relevant to this article was reported.

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