

## Case Report

## Late Retrograde Aortic Perforation by the Uncovered Part of an Endograft: An Increasing Complication

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**Aortic dissection, aortic aneurysm, stent.**

A 56-year-old man, known for type B aortic dissection, was treated 3 years before with a Talent endograft (Medtronic, Minneapolis, USA) in the descending aorta. He presented with tamponade caused by the perforation of the aortic intima by the uncovered stent strut. The ascending aorta and part of the aortic arch were replaced. The operation and recovery were uneventful. To avoid aortic arch damage by thoracic stent-grafts, the proximal stent should be fully covered. In addition we should be very cautious about the proximal landing zone of the stent, which should not be on the curved portion of the aorta.

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**E**ndovascular stent graft implantation is an alternative to conventional open surgery for the treatment of aortic aneurysm and dissections of the aortic arch and descending aorta. Although these procedures are less morbid for the patients than surgery, some potentially fatal complications may arise. We describe a case of perforation of the thoracic aorta by the uncovered part of the endograft.

### Case description

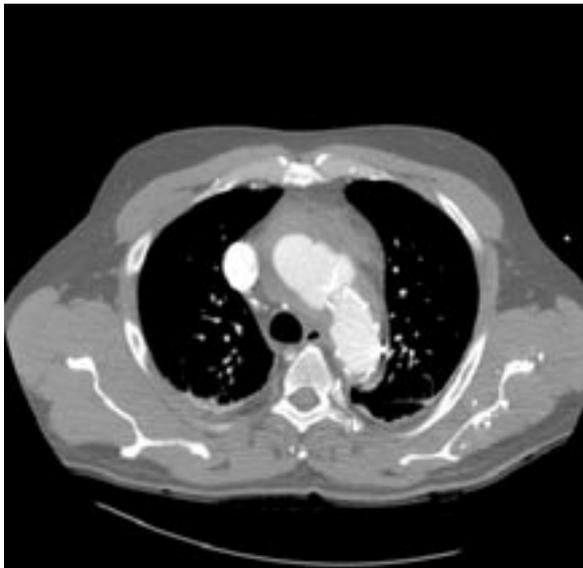
A 56-year-old man, known for type B aortic dissection, was treated 3 years before with a Talent endograft (Medtronic, Minneapolis, MN, USA) in the descending aorta and had the left subclavian artery overstented and occluded. He presented with severe chest pain and signs of tamponade. The computed tomography scan (Figure 1) confirmed the haemopericardium and showed a significant circumferential intramural haematoma of the ascending aorta. There was no image of a new dissection. He underwent emergency operation under cardio-

pulmonary bypass through right axillary artery cannulation and under moderate hypothermia (27 °C) with circulatory arrest limited to the lower body and continuous antegrade perfusion of the brain. The ascending aorta and part of the arch were replaced successfully. When the aortic arch was opened, we noticed that one of the uncovered stent struts had perforated the intima just at the end of the horizontal portion of the aortic arch and the beginning of the descending aorta. This intimal tear had initiated the haematoma, which found an exit in the proximal portion of the ascending aorta, creating the haemopericardium (Figure 1). The stent was well positioned in the descending aorta. The ascending aorta was resected up to the proximal limit of the stent and a 2-cm Teflon felt strip was interposed between the uncovered portion of the stent and the inner aortic wall. This Teflon felt strip served as protection from the uncovered part of the stent and as reinforcement for the sutures (Figure 2). The patient was discharged 8 days later in good condition.

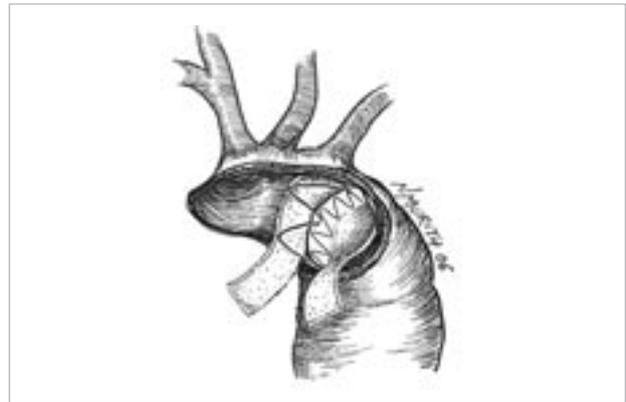
## Discussion

The advent of stent-graft technology has forever changed the management of aortic disease. Thoracic aortic aneurysms and aortic dissections are both amenable to endovascular repair. Although these procedures are less morbid for the patients than is open surgery, some potentially fatal complications may arise. Successful stent graft fixation in the thoracic aorta necessitates proximal and distal landing zones of at least 20 mm. Within this context, in order to enable stent-grafting of the arterial transostial zones, some stents have bare extremities. Our patient had his endograft (Talent, Free-flow) deployed on the limit between zones 1 and 2 of the aortic arch (Figure 1). The entry point of the intramural haematoma was located just under the tip of one of the bare stents. The literature reports some cases of late perforation of the aortic wall, generally attributed to fractures of the components of the stent-graft,<sup>1-4</sup> which perforated the aortic wall secondarily. Malina et al<sup>5</sup> reported a case of late aortic arch perforation directly attributed to the uncovered portion of the stent-graft, which was deployed just between zones 2 and 3 of the aortic arch.

All these cases had the bare portion of the stent located in curved zones of the aortic arch. The suggested



**Figure 1.** Computed tomographic scan showed the haemopericardium and a significant circumferential intramural haematoma of the ascending aorta.



**Figure 2.** Schematic representation of the aortic arch open, with the Teflon felt strip interposed between the uncovered stent-graft struts and the inner aortic wall.

mechanism of perforation seems to be the pulsatile wave progression through the ascending aorta and arch, which brings the aortic wall against the uncovered stent at each heart beat. This is a new type of complication arising from the increasing use of stent-grafts in various portions of the thoracic aorta. These cases stress the need for fixation stents to be flexible, less traumatic and strong enough to create a blood seal. To avoid aortic arch damage by thoracic stent-grafts the proximal stent should be fully covered by the fabric. In addition, when an uncovered end stent graft is required, we should be very careful in the choice of the proximal landing zone, which should not be in the curved portion of the aorta.

## References

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