Vertebral Body Erosion in a 27-Year-Old Woman 12 Years After Thoracic Endovascular Aortic Repair

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A 27-year-old woman presented with persisting, medically refractory back pain. Patient history revealed severe blunt chest trauma after a car accident at the age of 14. She had been 1 of the first adolescents to be treated by thoracic endovascular aortic repair (TEVAR) for acute rupture of the aortic isthmus, covering the distal aortic arch down to the thoracic level of Th7. First symptoms of back pain occurred 5 years after TEVAR and became progressively severe in the following years, and she required medical and orthopedic therapy. Eventually, when her back pain became unbearable at the age of 27, a computed tomography scan revealed an erosion of the seventh thoracic vertebral body distally from the implanted stent-graft (Talent, Medtronic Inc, Minneapolis, MN; Figure 1; Movie I in the online-only Data Supplement). Volume-rendered 3-dimensional computed tomography reconstruction revealed a broken bare spring at the distal end eroding the vertebral body, and thereby causing a state of chronic and progressively severe back pain (Figure 2; Movie II in the online-only Data Supplement); further image data segmentation allowed for isolated stent-graft inspection to identify additional bare spring fractures and to plan open surgical removal (Figure 3; Movie II in the online-only Data Supplement).

Open thoracic aortic repair was performed urgently to remove the stent-graft and its remnants and replace the eroded aorta via a left lateral thoracotomy. Successful stent-graft removal was aggravated because of the severe adhesions triggered by chronic inflammation in close proximity of the stent-graft owing to prosthetic failure (ie, eroding broken bare springs and dissolving prosthetic material). The following clinical course was uneventful, and the patient was discharged on postoperative day 5. Thirteen months later the patient was asymptomatic and doing just fine.

Open aortic surgery remains the gold standard to treat thoracic aortic pathologies extending beyond the distal arch because of acceptable postoperative mortality and morbidity with excellent long-term outcomes.\(^1,2\) Commercially available endovascular stent-grafts are currently designed to have a durability of ≥10 years according to internationally standardized stress testing, but there are no studies comparing the outcome after TEVAR in younger versus older patients.\(^2\) Most recently, extensive aortic coverage by endovascular stent-grafts has also been associated with a significantly increased risk of paraplegia.\(^3,4\) Despite a reported low early postoperative mortality, stent-grafts, in comparison with open aortic surgery, tend to result in a higher incidence of long-term complications (eg, endoleaks, device failure or migration, and aneurysm-related death).\(^3\)

Because long-term outcome after TEVAR (>10 years) remains unknown, we believe that stent-grafts, especially in the very young, should only be used in life-saving clinical emergencies, because severe collateral damage to adjacent mediastinal structures might occur unexpectedly.

Disclosures

None.

References


Figure 1. Computed tomography revealing an erosion of the seventh thoracic vertebral body (arrows) in close proximity of the stent-graft. The maximum intensity projection (right) reveals the broken stent-graft fragment in the inferior part of the prosthesis.

Figure 2. Volume-rendered 3-dimensional computed tomography scan reconstruction showing a spring fracture with callus formation at the anterior surface of the vertebral body (arrows).

Figure 3. Isolated 3-dimensional reconstruction of the stent-graft showing a spring fracture at the distal end (arrow).
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**Movie Legend**

**Movie 1.** Computed tomography (CT) revealing an erosion of the 7th thoracic vertebral body in close proximity to the distal end of the stent-graft (transversal, frontal and sagital views). Best viewed with Windows Media Player.

**Movie 2.** Volume rendered three-dimensional reconstruction to allow for exact localization of the bare spring fracture and optimal operation planning. Best viewed with Windows Media Player.