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Pressure injury to the chest wall caused by vascular graft and endograft after thoracic and thoraco-abdominal aortic repair

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Abstract

Thoracic and thoraco-abdominal aortic repair remains a challenging issue in vascular surgery, and long-term complications are well described. We report 2 cases of octogenarians with unusual long-term complications after open and endovascular thoracic aortic repair of chest wall pressure injury from the vascular prosthesis. In the first case, a computed tomographic scan of an 80-year-old man showed a pressure injury of the chest wall and rib erosion caused by a Dacron graft. The second case was an 81-year-old woman who presented with external bleeding from the left posterior chest wall. A computed tomographic scan showed a type IA endoleak and chest wall damage with rib erosion and thoracic cutaneous fistulae from the endovascular graft. Both patients were treated by relining the endovascular graft; debriding the surgical fistula was done only in the second case. In our experience, endovascular repair is a good option to avoid a complete open surgical repair.

Keywords: Chest wall • Pressure injury • Aortic aneurysm • Vascular graft • Endovascular repair

INTRODUCTION

Treatment of thoracic and thoraco-abdominal aortic aneurysms (TAAA) remains a challenging issue in vascular surgery. Late complications after both open surgery and thoracic endovascular aortic repair (TEVAR) are well known [1]. Our goal was to report 2 cases of chest wall pressure injury and rib erosion as late complications after thoraco-abdominal aortic and TAAA repair.

CASE 1

An 83-year-old man was admitted to our emergency department because of acute onset pain in the left chest. We had performed an operation on this patient 7 years previously. The patient was diagnosed with type III TAAA that was treated surgically with a Dacron graft via a thoraco-phreno-laparotomy. The postoperative course was uneventful ([Supplementary Material](#), Fig. S1).

When the patient was readmitted to the hospital, we performed computed tomographic angiography (CTA) that showed an erosion in the posterior arch of the 10th left rib due to a pressure damage caused by the aortic graft to the posterior chest wall.

The patient was judged unfit for open surgery. With the patient under local anaesthesia, we performed an endovascular relining of the surgical graft via a percutaneous approach to the right

femoral artery using a 34- × 113-mm Zenith Alfa thoracic stent graft (Cook Medical Inc., Bloomington, IN, USA).

After the procedure, the patient experienced full pain relief and was discharged with no further complications. The 30-day CTA follow-up examination showed complete coverage of the ulcerated area and reduction of the oedema (Fig. 1).

CASE 2

An 81-year-old woman was admitted to our emergency department with massive external bleeding from the left posterior chest wall. The patient had a clinical history of a previous arch aneurysm repair by TEVAR with the proximal landing in zone 1, plus a carotid-carotid-left subclavian bypass, performed 5 years before in another centre. Four years after that procedure, the patient experienced a small skin lesion in the left chest with leaking of serous material and was treated with an unspecified endovascular procedure on the descending aorta plus wound care of the thoracic wall lesion.

At the time of her admission to our emergency department, a new emergency CTA showed a type 1A endoleak due to the distal migration of the prosthesis along the aortic arch, a lesion on the chest wall from the endograft and concomitant erosion of the ninth left rib, complicated by an aortocutaneous fistula. With the patient under general anaesthesia, via percutaneous right

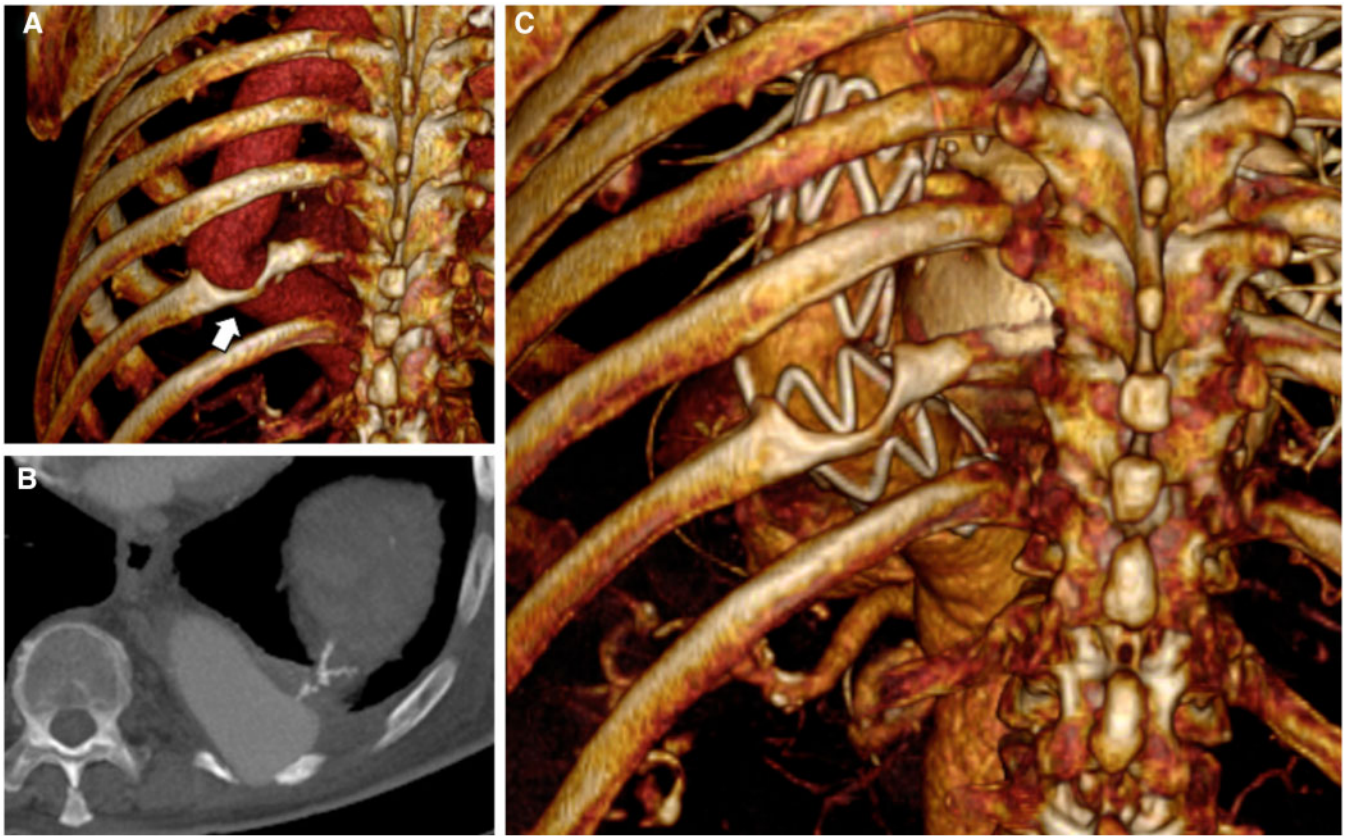


Figure 1: (A) Computed tomographic angiographic (CTA) volume-rendering reconstruction showed damage to the graft with rib erosion (white arrowhead); (B) CTA axial image; (C) postoperative CTA volume-rendering reconstruction.

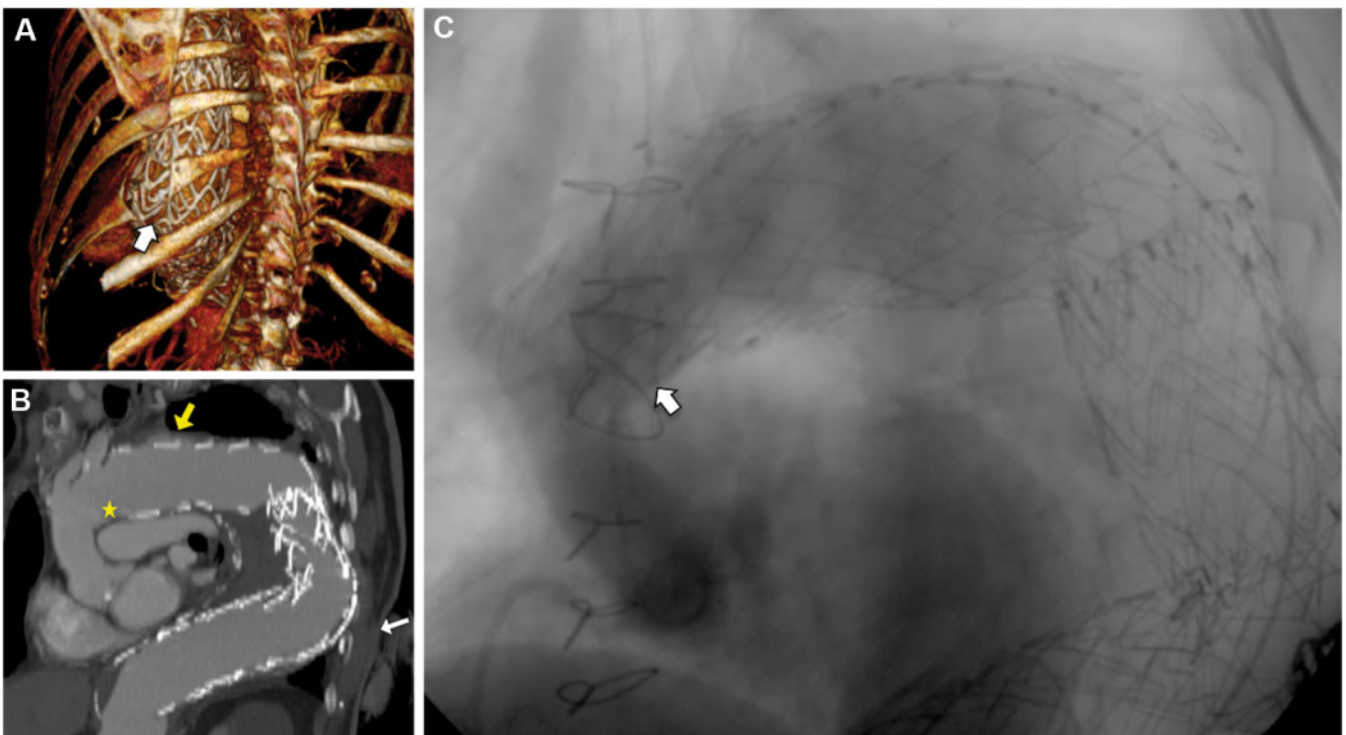


Figure 2: (A) Computed tomographic angiographic volume-rendering reconstruction showed injury to the thoracic endograft to the thoracic wall with rib erosion (white arrowhead). (B) Multiplanar reconstruction, type IA endoleak (yellow arrow), endograft migration (yellow star) and endograft pressure injury with aortocutaneous fistula (white arrow). (C) Intraoperative angiography after proximal endograft (white arrowhead) placement, showing the resolution of the type IA endoleak.

femoral access, we performed an endovascular relining of the previously implanted endograft using a 46- × 125-mm Zenith Alpha thoracic stent graft (Cook Medical Inc.). The endograft was released in zone 1 just below the innominate artery ostium, under rapid cardiac pacing. Completion angiography showed complete exclusion of the endoleak (Fig. 2). Wound care included debridement and negative-pressure therapy (Supplementary Material, Fig. S2). Positron emission tomography-computed tomography scans performed to evaluate the presence of a concomitant endograft infection disproved our clinical suspicion.

At the 30-day follow-up examination, CTA showed good exclusion of the aneurysm without signs of endoleak; and, a clinical examination reveals improvement of healing of the fistula.

DISCUSSION

Because it is less invasive [1], TEVAR is now considered the standard of care for the treatment of complications after open and endovascular repair of thoraco-abdominal aortic and TAAA in elderly and fragile patients who present with several comorbidities and a high rate of major complications associated with open surgery, such as the 2 cases just reported. Therefore, in line with current recommendations, we decided to treat our patients by TEVAR, thereby avoiding explantation of the graft.

To the best of our knowledge, such complications have not been previously reported. In the absence of dedicated experimental or cadaveric studies, we could speculate that the lesions

were caused by the chronic mechanical trauma exerted by the aortic prostheses on the adjacent structures. Moreover, in our 2 cases, the trauma could have been exacerbated by excessive angulation of the aortic graft. Theoretically, angulation could have concentrated all the involved mechanical forces in a single, limited portion of the ribs, causing bone erosion.

In absence of guidelines and recommendations for these kinds of lesions, we suggest performing an immediate aortic repair to relieve pain and, especially in cases presenting with an aortic fistula, to avoid the serious complications reported in cases of an aorto-oesophageal or aortobronchial fistula [2].

SUPPLEMENTARY MATERIAL

Supplementary material is available at *ICVTS* online.

Conflict of interest: none declared.

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