Luetic aneurysm of the descending thoracic aorta: mid-term results of endovascular treatment

Clinical History:
An aneurysm of the descending thoracic aorta in tertiary syphilis discovered as an accidental finding on transoesophageal ultrasound.

Imaging Findings:
A 49-year-old male patient underwent surgical replacement of the aorta ascendens including the aortic valve and the aortic arch because he had severe aortic valve insufficiency and aortic aneurysmal disease as a result of a luetic mesoartitis. Medical history indicated that the patient contracted luetic infection during one of several visits to southeast asia between 1980 to 1984. There were no other risk factors for cardiovascular disease. Because of the artificial heart valve the patient was put on coumarin.

Eleven years later the patient suffered a TIA. A transoesophageal ultrasound was performed that showed, as an accidental finding, an aneurysm in the caudal segment of the descending thoracic aorta. The patient, who had no symptoms related to the aneurysm, was referred to our hospital for further treatment.

A CT scan was performed. The aneurysm, of a maximum axial diameter of 6 cm, had penetrated into the 11th and 12th thoracic vertebrae, and extended into the spinal canal (Fig. 1). Because of the previous cardiovascular surgery, the risk of open surgery was highly increased. Endovascular treatment was proposed to the patient as a less risky, but also less-established, option. Endovascular prostheses with large diameters appropriate for the thoracic aorta were not yet commercially obtainable at that time. The Corvita prosthesis (formerly from the Corvita Company, now Boston Scientific, Brussels, Belgium) was available in suitable diameters, but that was still in the stage of clinical evaluation. The Corvita prosthesis is a stent-graft with an outer Elgiloy wiremesh covering an inner lining with the synthetic polymer polyurethane carbonate [1]. The prosthesis is manually cut to the required length and preloaded into a dedicated delivery device.

The pros and cons of both treatment options were discussed with the patient in detail. The patient preferred the
endovascular approach. The coumarin medication was changed to heparin and intra-arterial angiography was performed to assess the local vascular anatomy (Fig. 2).

Discussion:

In January 1997, the intervention was performed by a vascular surgeon and an interventional radiologist working together. Via a right femoral access the origin of the coeliac trunc was marked by selective catheterisation. Through a left femoral cut down a 7 cm long, 35 mm wide Corvita stent-graft was advanced and released into the aneurysmatic segment under fluoroscopic guidance. There was an endoleak at the caudal end of the prosthesis. A second Corvita stent-graft of similar size was placed overlapping the first one. The caudal end of the second prosthesis was located directly above the origin of the coeliac trunc. Control angiograms showed no persistent endoleak. The coeliac trunc remained patent. No major perioperative complications occurred. Follow-up CT scans were done the day after the intervention, and in 2–4 month intervals during the next 1.5 years (Fig. 3). The CT scan after 7 months demonstrated a narrowing of more than 50% of the aortic lumen in the mid-segment caused by progressive caudal expansion and cranial constriction of the caudal stent-graft (Fig. 4).

In a second intervention 1 month later, a 3 cm long Palmaz stent premounted on a 25 mm balloon was successfully placed in the stenotic segment. The stenosis was completely removed (Fig. 4), and the aneurysm remained excluded. However, the follow-up CT scan 17 months after the first intervention revealed reperfusion of the aneurysm in the caudal segment (Fig. 5a). The findings remained stable during the next 17 months (Fig. 5b and 5c). Reperfusion probably resulted from progressive shortening of the caudal stent-graft. No further interventions have been undertaken. Fifty-four months after the first treatment the patient is alive and well.

Aortic aneurysm formation indicating tertiary syphilis is very rare nowadays. Consequently, there are only a few case reports in the literature, but no reports on larger series [2]. The 5- and 10-year survival rate of patients with untreated thoracic aneurysms is about 50% and 30%, respectively [3]. Endoluminal repair of thoracic aorta aneurysms is not yet an established method of treatment, and is usually confined to patients with an increased risk of open surgery. In a recent review article the overall aneurysmal thrombosis rate after endoluminal treatment was reported to be 90–100% [4]. The postoperative mortality rate was said to be 0–4%, and the rate of paraplegia 0–1.6%. These figures are much better than those reported in a larger series of 103 patients with endoluminal repair of thoracic aortic aneurysms published by Mitchell and co-workers in 1999 [5]. In this series patients were treated between 1992 and 1997 with homemade stent-grafts. The average follow-up time was 22 months. The overall aneurysmal thrombosis rate was 83% and perioperative mortality was 9%. Major perioperative morbidity occurred in 31 patients and included paraplegia in 3, and cerebrovascular accident in 7. Only 53% of patients were free of treatment failure at 3.7 years. The authors attributed the high mortality and morbidity rates to the severe comorbidities of the patients, and predicted that second-generation devices, in combination with increasing experience, would lead to better results in the future.

Differential Diagnosis List: Endoluminal treatment of a syphilitic aneurysm of the thoracic aorta

Final Diagnosis: Endoluminal treatment of a syphilitic aneurysm of the thoracic aorta

References:


Mickley V, Mohr W, Orend KH, Sunder-Plassmann L. Aneurysm of the descending thoracic aorta in tertiary syphilis.


Description: CT with intravenous contrast. Soft tissue window. Destruction of the vertebrae by the descending aortic aneurysm that extends into the spinal canal. Origin:
b

Description: CT with intravenous contrast. Bone window. Destruction of the vertebrae is more clearly demonstrated. Origin:

c

Description: Sagittal reconstruction with intravenous contrast. Intermediate window. Finger-tip like expansion of the aneurysm through the vertebrae into the spinal canal. Origin:
Figure 2

Description: PA view of the aneurysm. A measuring catheter was placed into the descending thoracic aorta. The distance between the markers is 2 cm. The aneurysm reaches almost down to the origin of the coeliac trunc. Origin:
Description: Lateral view. The dorsal extension of the aneurysm is demonstrated. Origin:
Figure 3

Description: CT with intravenous contrast. Soft tissue window. The aneurysm is completely excluded.

Origin:
Description: CT with intravenous contrast. Soft tissue window. Slice at the level of the coeliac trunc. The wires of the stent-graft extend down to the origin of the coeliac trunc that is completely patent.

Origin:
Description: Coronal reconstruction after intravenous contrast 3 months after the intervention. Bone window. The aneurysm is excluded. Slight protrusion of the cranial end of the lower stent-graft into the lumen. Origin:
**Figure 4**

**a**

*Description:* CT without intravenous contrast 7 months after endoluminal treatment. More than 50% reduction in diameter of the cranial end of the lower stent-graft. *Origin:*

**b**

*Description:* CT without contrast 1 week after Palmaz stent placement. Soft tissue window. Restoration of the stent-graft lumen. *Origin:*
Figure 5

Description: CT with intravenous contrast 17 months after the first intervention. Soft tissue window. Reperfusion of the aneurysm at the caudal end of the protheses. Origin:
Description: CT without intravenous contrast 34 months after the first intervention. Soft tissue window. The wiremesh of the stent-graft is disrupted at its dorsocaudal margins. There are some calcifications of the aneurysmal wall. Origin:
Description: CT with intravenous contrast 34 months after the first intervention. Soft tissue window. Similar extension of the reperfused aneurysm compared to the control 17 months before. Origin:
Figure 6

**Description:** This image was obtained immediately after placement of the Palmaz stent, 8 months after the first intervention. Fusiform expansion in the caudal segment of the prostheses. The caudal ends of the prostheses look homogenously structured. **Origin:**
Description: AP X-ray 34 months after the initial treatment. Compared with Fig. 6a overlap of both stent-grafts has increased because of progressive shortening. The fusiform bulging of the caudal ends of the prostheses has disappeared. Origin: