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ENDOVASCULAR AND SURGICAL TECHNIQUES

AAA Endografting: Two Straightforward Indications?

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Introduction

Endoluminal repair of infrarenal aneurysms of the abdominal aorta is still controversial. Much uncertainty continues to exist about its proper application and its success and reliability.[1]

We report two cases with different types of aneurysms of the infrarenal abdominal aorta, in which there is, in our view, a clear preference for endoluminal exclusion of the aneurysm.

Cases

A 56-year-old man presented with a 2-week history of a progressive pain in the back and abdomen. The patient was known to have an infrarenal aneurysm of the abdominal aorta (diameter 40 mm) and a horseshoe kidney. On physical examination, the aorta was painful. Pulsations in the femoral arteries existed. The ankle–brachial index was 1.01 at the right and 1.00 at the left side. Preoperative work-up consisted of a spiral computed tomography (CT) scan and an intra-arterial abdominal angiogram and resulted in an aneurysm of the abdominal aorta with a largest diameter of 49 mm, expanding in the common iliac arteries. There was no significant angulation of the aortic neck, or iliac arteries. The inferior mesenteric artery was occluded and both the internal iliac arteries were patent. Both renal arteries divide high up, next to the superior mesenteric artery (Fig. 1A). There were no aberrant renal arteries. The proximal neck of the aneurysm was 24 mm long and 23 mm wide, without thrombus or calcifications, and consequently fit for endovascular fixation (Fig. 2). Preoperative kidney function was normal (urea: 5.5 mmol/l and creatinine: 91 μmol/l). The patient was operated on under epidural anaesthesia. An AneuRx 26/15/165 aortoiliac stent graft was placed transfemorally, followed by a 16/115 iliac contralateral leg and two iliac extensions of 15/55 right and 16/55 left (Medtronic AVE, California, U.S.A.). Occlusion time of the aorta was 5.5 minutes, fluoroscopy time was 27 min, blood loss was 200 ml, and skin-to-skin time was 105 min.

The postoperative course was uneventful, except for a grade I wound infection of the right groin. The abdominal aorta was not painful on palpation any more. The patient was fully ambulatory the day after surgery. Postoperative kidney function remained normal (urea: 6.3 mmol/l and creatinine: 128 μmol/l). CT scan and duplex scanning of the abdomen, on discharge (fifth postoperative day) and after 12 months, showed no evidence of endoleak and a normal (horseshoe) kidney function (Fig. 1B). The aneurysm size was decreased to 43 mm.

An 83-year-old man, who had recovered from a pneumococcal sepsis 6 months ago, was referred to our hospital with an asymptomatic saccular aneurysm of the infrarenal abdominal aorta with a diameter of 55 mm. Preoperative work-up consisted of spiral CT scan and intra-arterial abdominal angiogram, which resulted in a saccular aneurysm with a largest diameter of 60 mm. On spiral CT there was no evidence of aorta wall infection. The erythrocyte sedimentation rate (ESR) was 20 mm/h. Therefore, an active mycotic aneurysm was unlikely. The inferior mesenteric artery as well as both the iliac arteries were patent. There was no significant angulation of the aortic neck, or

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(A) (B)

Fig. 1. (A) Preoperative intra-arterial abdominal angiography. Arrow indicates horseshoe kidney. (B) Postoperative spiral CT scan. Bifurcated stent graft is centrally placed in the abdominal aortic aneurysm with, in front, the horseshoe kidney showing homogenous contrast enhancement.

iliac arteries (Fig. 3A). The proximal neck of the aneurysm was 33 mm long and 20.3 mm wide, the distal aortic neck was 19.1 mm wide, 16.1 mm long. Both sides showed no evidence of relevant thrombus or calcifications and were appropriate for endovascular fixation (Fig. 2).

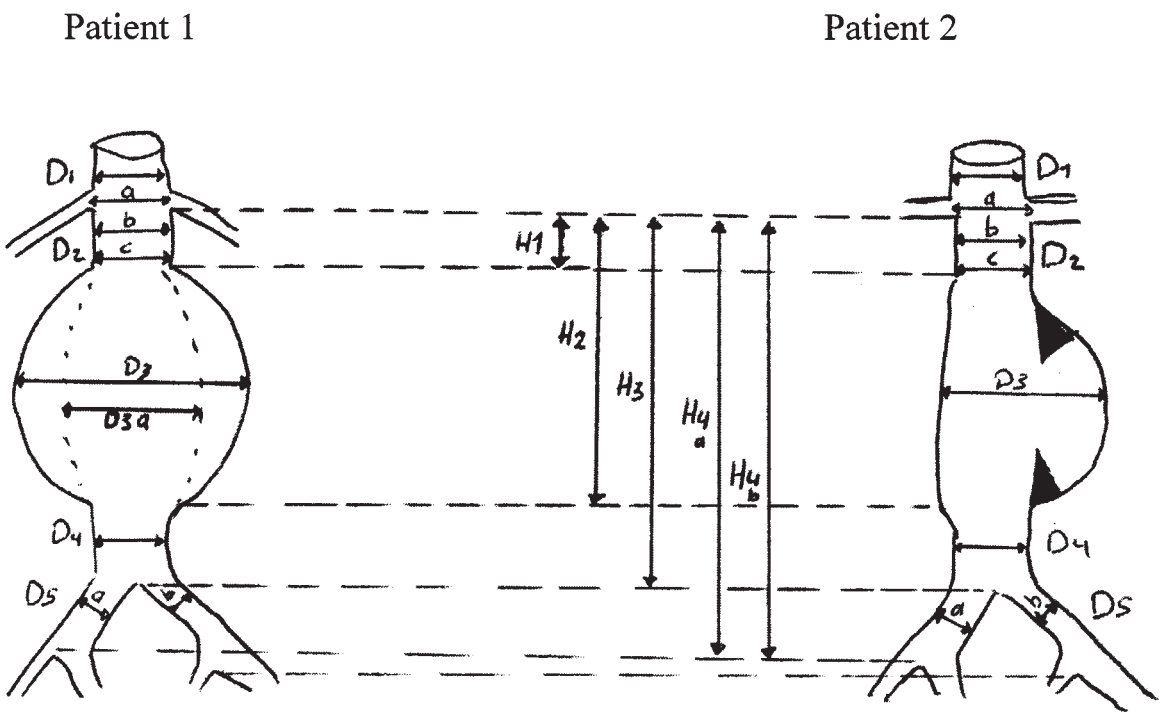
The patient was operated on under epidural anaesthesia. Antibiotic prophylaxis (Broxil®) was given for 3 months, because of the recent pneumococcal sepsis. He was treated by left-sided transfemoral stent-graft placement with an AneuRx 28/95 straight-tube stent graft (Medtronic AVE, California, U.S.A.). Occlusion time of the aorta was 3 min, fluoroscopy time was 8 min, blood loss was 50 ml, and skin-to-skin time was 55 min.

Postoperatively, the course was uneventful. The patient was fully ambulatory the day after surgery. CT scan and duplex scanning of the abdomen on discharge (fifth postoperative day) and after 12 months showed no evidence of endoleak. The aneurysm size was decreased to 44 mm. The ESR was 10 mm/h.

Discussion

Horseshoe kidneys are reported in 1:700 unselected autopsies.[2] They complicate surgery in one out of 200 patients with abdominal aneurysms.[3] The exposure is made more difficult not only because of the location of the isthmus of the horseshoe kidney, but also because of the common arterial anomalies.[4–6] Division of the functional renal isthmus should be avoided in all patients, and ligation of aberrant renal arteries may result in ischaemic necrosis of a portion of the horseshoe kidney.[2,6,7] Because of the concomitant horseshoe kidney, the conventional repair by laparotomy or by retroperitoneal approach is technically demanding. Therefore, an endovascular procedure seemed to be a better option than the conventional repair. Literature search revealed two case reports of successful transfemoral endoluminal repair of a juxtarenal aortic aneurysm associated with a horseshoe kidney.[8,9] In one patient the postoperative course was complicated by a kidney infarction which did not affect renal function or blood pressure.[8] In another patient an anomalous renal vessel was sacrificed without impairment of renal function.[9] Due to the favourable anatomy of the renal arteries, this problem did not occur in the present case.

Saccular aneurysms of the abdominal aorta are rare. An important feature of these aneurysms is that the chance of rupture is unpredictable. Because of the relatively high risk of rupture of such a saccular aneurysm, aortic replacement was indicated. An endovascular approach was chosen because of the high



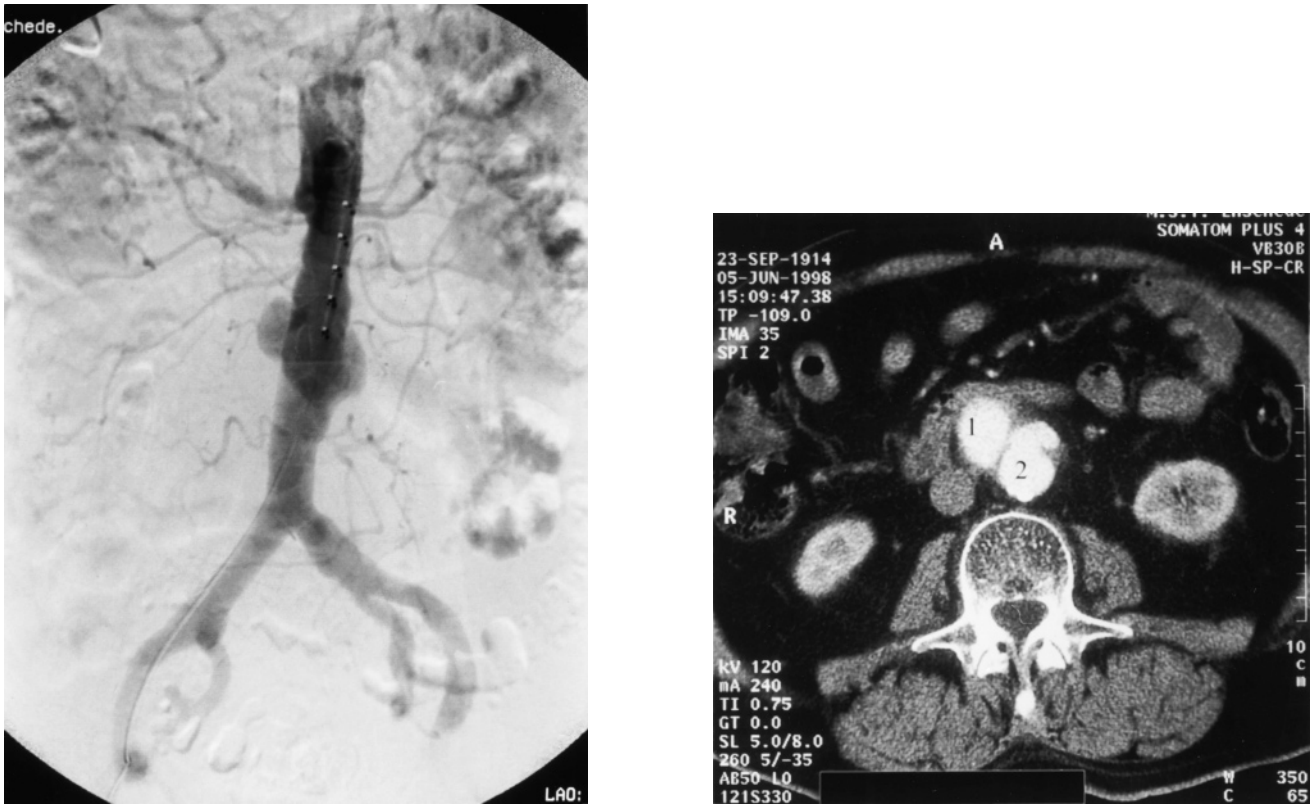
Measurements (mm)

D1	**23**	**25**
D2a	**22**	**20**
D2b	**22**	
D2c	**23**	**20**
D3		**60**
D3a	**49**	
D4	**40**	**19.1**
D2b	**15**	**12.1**
D5b	**12**	**15.5**
H1	**24**	**33**
H2		**77**
H3	**144**	**93.1**
H4a	**174**	
H4b	**174**	

Fig. 2. Abdominal aortic aneurysm measurement worksheet.

cardiovascular risk factors (hypertension, atrial fibrillation and mitral valve insufficiency) combined with his high age. Only one report could be found which presented stent graft placement for saccular aortic aneurysms. Two procedures were successfully performed; however, in one patient with a thoracic aortic aneurysm the course was complicated by resection of small bowel because of distal embolisation and renal dialysis due to renal infarction.[10]

We report two cases of endovascular treatment of abdominal aneurysm in patients with demanding comorbidity. Short-term advantages of the endovascular technique such as reduction of morbidity and pain, and therefore shorter hospital stay, earlier return to normal diet and daily activity, are known. This is confirmed in the present two cases, both with a potentially complicated conventional approach. Although we do not know yet the long-term patency



(A) (B)

Fig. 3. (A) Preoperative intra-arterial abdominal angiography demonstrating the saccular aneurysm. (B) Preoperative spiral CT scan. 1 = aorta; 2 = saccular aneurysm.

and complication rates of endovascular treatment of abdominal aortic aneurysms, we feel that patients with appropriate fixation areas and with demanding morbidity should preferably be treated with endovascular stent grafts.

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