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SHORT REPORT

Aortic Endograft Infection: Open Surgical Management with Endograft Preservation

S.J. Hulin* **and G.E. Morris**

Department of Vascular Surgery, Southampton General Hospital, Southampton, Hants, UK

Introduction. *We report successful management of aortic endograft infection without graft explantation or extra-anatomic bypass.*
Report. *A 66 year-old male who had undergone endovascular repair of an aortic aneurysm presented with abdominal pain and raised inflammatory markers following embolisation of a type-2 'endoleak'. CT scanning revealed a left psoas fluid collection. Endograft infection was diagnosed. Following failure of CT-guided drainage and conservative management, surgical drainage with irrigation drain placement was undertaken with preservation of the endograft. There was no evidence of recurrent infection after follow-up at 30 months.*
Discussion. *Aortic endograft infection may be managed without endograft removal and extra-anatomic bypass.*

Keywords: Aortic aneurysm; Endovascular repair; Infection.

Introduction

Aortic stent graft infection is a rare but disastrous complication associated with high mortality. Infection rates for endovascular repair of aortic aneurysm (EVAR) are unclear although Fiorani *et al.* (2003) estimated an infection rate around 0.4%.[1] We report successful surgical management of EVAR infection, without endograft removal or extra-anatomic bypass.

Report

A 66 year-old male with multiple cardiorespiratory comorbidities presented with increasing abdominal pain following EVAR two years previously. Secondary intervention for lumbar type-2 endoleak associated with increasing sac diameters, had been performed 14 months after EVAR.

CT angiography revealed persistent type-2 endoleak, which was successfully treated by translumbar guided 18G needle thrombin injection (Baxter: Human Thrombin 2,500IU and Johnson & Johnson: Spongistan/contrast slurry) in the CT suite under aseptic conditions. The patient continued to experience increasing abdominal pain, associated with elevated C-reactive protein (CRP) levels. CT scanning 4 days later confirmed successful treatment of the endoleak, and found no obvious source of intra-abdominal sepsis. A small gas bubble within the aneurysm sac was felt to be secondary to recent radiological intervention. A CT scan at 28 days revealed a left psoas abscess and this was drained under CT guidance (Fig. 1). Intravenous broad-spectrum antibiotics were commenced, then changed to Benzyl Penicillin after culture of *Streptococcus oralis* from the aspirate. The drain was removed when drainage had been negligible for 36 hours. CT scan 9 days after drainage confirmed abscess resolution, accompanied by reduction in aneurysm sac diameter, suggesting communication between sac and abscess, and graft infection.

Symptoms returned one week later. CRP levels remained elevated. CT-guided drainage was repeated, but re-scan three days later showed the drain lying outside the aneurysm sac. Intravenous antibiotic therapy was continued. Repeat imaging one week later again revealed increased aneurysm sac diameters.

*Corresponding author. Miss Sarah J. Hulin, FRCS, Department of Vascular Surgery, Southampton General Hospital, Southampton, Hants BH7 7DW, UK.
E-mail address: sjhulin@ntlworld.com

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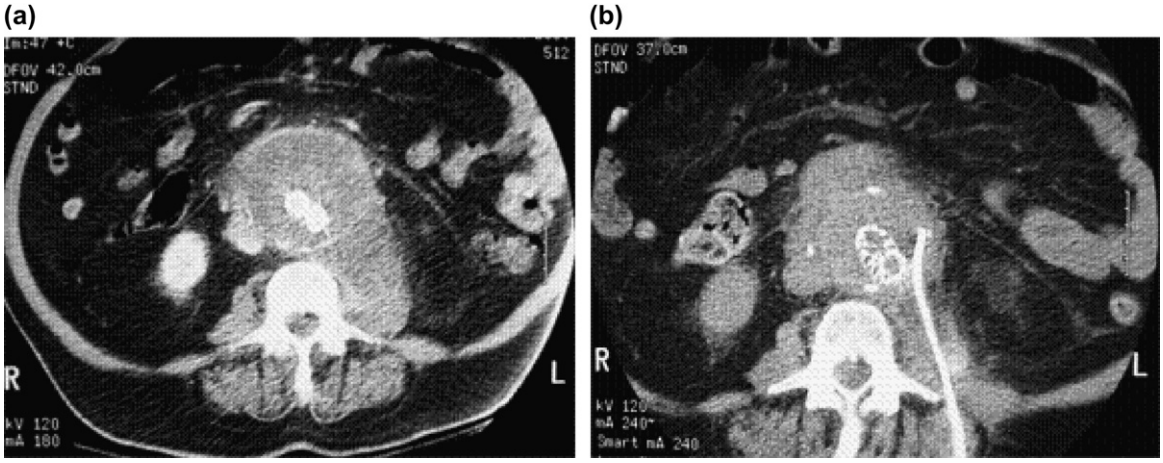

Fig. 1. CT scan images showing aneurysm sac/psoas collection (a) and percutaneous drain (b). a) sac expansion & psoas collection b) percutaneous drainage.

After discussion between vascular radiologists and surgeons it was decided to attempt open drainage. A transperitoneal approach via a transverse incision was used. Dissection at the aneurysm neck was difficult due to fibrosis and preparations for supracoeliac clamping or balloon occlusion were made. The aneurysm sac was opened anteriorly along 90% sac length without proximal or distal clamping, with no bleeding. Careful debridement was performed without altering graft position. Two lumbar arteries remained patent on removal of sac thrombus, despite prior radiological intervention, and these were underrun. Infected sac contents were sent for microbiology. Following copious sac lavage, three large Wallace drains were placed as shown in Fig. 2. Gentamicin-impregnated foam was packed around the endograft, and the sac was closed tightly. Post-operatively the patient was commenced on intravenous Vancomycin, Ciprofloxacin, and Metronidazole. Continuous Gentamicin irrigation via the abdominal drains was performed as described by Morris *et al.* (1994).[2] *Strep. oralis* and *Strep. mitis* were cultured from the aneurysm sac contents, and therapy was changed to Penicillin and Rifampicin. No bacterial growth was observed from any drain fluid. Rapid improvement in analgesic requirement was noted, together with falling inflammatory markers. Repeat CT scans 6 and 14 days post-operatively showed no further collections. Drains were removed sequentially (3, 1, 2, as in Fig. 2), when no further drainage was observed.

The patient was discharged 17 days after surgery, with two further week's intravenous antibiotics. This was followed by oral Rifampicin for four months (six months antibiotic therapy in all). Clinical, inflammatory marker, and CT follow-up to thirty months after sac irrigation shows no evidence of recurrent infection.

Discussion

Late infection introduced at local thrombin injection for endoleak after EVAR is described here, and has been reported previously,[3] highlighting the need for strict asepsis, and avoidance of unnecessary

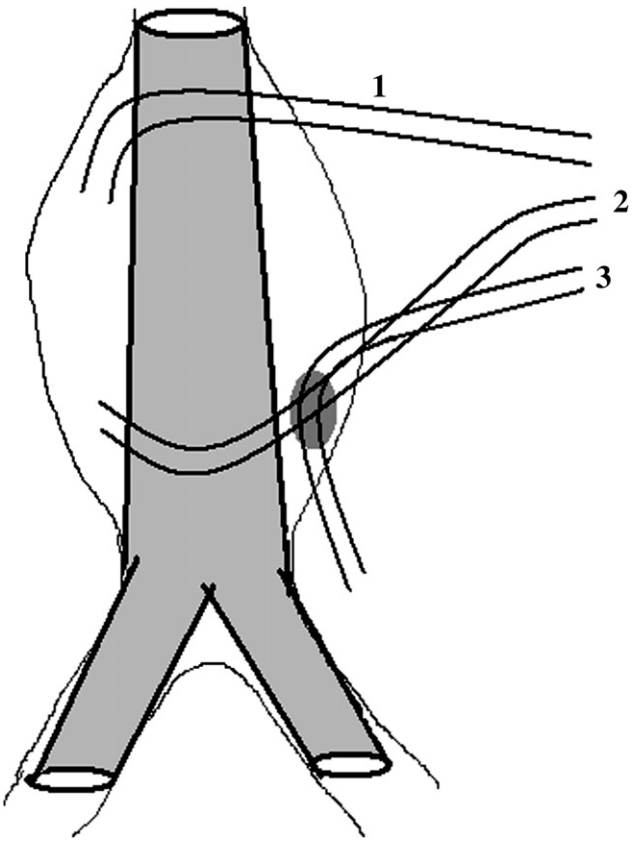

Fig. 2. Surgical drain placement: 1 − superior, 2 − inferior, 3 − psoas collection.

interventions. Our patient presented with vague symptoms; the diagnosis of graft infection was delayed. In Fiorani's series, 35% of patients presented with non-specific symptoms, whilst 65% presented with abdominal abscess, groin fistula or septic emboli. The latter represent late symptoms. The mean interval between diagnosis and onset of symptoms was 42 days (2-392).[1] The presence of gas within the aneurysm sac might have led us to diagnose graft infection earlier, however this may not be a reliable marker of infection post-intervention, even when accompanied by fever and leukocytosis.[4]

In Fiorani's series, conservative management of 11 of the 62 (17.7%) infected endovascular grafts carried a mortality of 36.4%. Forty-nine (79%) patients with infected grafts were treated surgically, the majority by graft explantation and extra-anatomic bypass, or by in situ graft replacement. Surgery carried an overall mortality of 27.4%, with an operative mortality of 16%.[1] We suggest that the more conservative surgical approach described here, with endograft preservation, could reduce operative mortality. Placement and securing of drains is clearly crucial to this approach, as is sequential culture of drain effluent with the institution of appropriate antimicrobial therapy.

References

1 Fiorani P, Speziale F, Calisti A *et al*. Endovascular graft infection: preliminary results of an international enquiry. *J Endovascular Ther* 2003;**10**:919–927.
2 Morris GE, Friend PJ, Vassallo DJ *et al*. Antibiotic irrigation and conservative surgery for major aortic graft infection. *J Vasc Surg* 1994;**20**:88–95.
3 Eliason JL, Guzman RJ, Passman MA *et al*. Infected endovascular graft secondary to coil embolisation of endoleak: a demonstration of the importance of operative sterility. *Ann Vasc Surg* 2002;**16**(5): 562–565.
4 Velasquez OC, Carpenter JP, Baum RA *et al*. Perigraft air, fever, and leukocytosis after endovascular repair of abdominal aortic aneurysms. *Am J Surg* 1999;**178**(3):185–189.

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