Inflammatory Aneurysm of the Abdominal Aorta Infected by Salmonella Dublin

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Introduction

Inflammatory aneurysms of the abdominal aorta (IAAA) are specific entities with characteristic pathologic findings. The first description of an inflammatory aortic aneurysm was given by Walker et al. in 1972, who described a thickened aortic wall with diffuse adhesions to the surrounding tissues and viscera.

We report a case of an inflammatory aneurysm contaminated with Salmonella dublin.

Case Report

A 66-year-old man was admitted with postprandial abdominal pain, nausea, vomiting, anorexia and night sweating. He also gave a history of intermittent claudication in the left leg and had a pretibial leg ulcer on the same side. He was a heavy smoker. Physical examination revealed a pulsatile tender abdominal mass and a paraumbilical arterial bruit extending to both femoral arteries. Investigations revealed a sedimentation rate of 90 after 1 h, a C-reactive protein of 12.6 mg/dl (normal < 0.5 mg/dl), and moderate renal insufficiency. Ultrasonography confirmed the presence of an infrarenal, fusiform abdominal aortic aneurysm, 10 cm long with a maximum diameter of 5.5 cm. Little intraluminal thrombus was seen.

At emergency laparotomy the aneurysm was found to be of the inflammatory type involving the duodenum, gallbladder and left ureter. There was some free intraperitoneal serous fluid. Gram stain of the fluid showed no bacteria. There was no retroperitoneal haematoma. Since there was a suspicion of suprarenal extension and no clear signs of rupture, the abdomen was closed. With the patient still under anaesthetic, aortography and abdominal CT-scan were performed. These examinations showed the aneurysm to be infrarenal, with extensive inflammatory thickening of the wall (Fig. 1). A conservative approach was adopted, using prednisolone 5 mg twice a day to reduce the periaortal fibrosis and to make subsequent operation easier but on the third postoperative day the patient developed hypovolaemic shock with extreme pallor of both legs and paraplegia. At laparotomy, a large right-sided retroperitoneal haematoma was found. The neck of the aneurysm was controlled at the level of the renal arteries and a bifurcated 18/9 mm coated Dacron prosthesis (Gelseal) inserted.

The results of the blood cultures taken at the first operation showed Salmonella dublin (Group D) biotype 4704550. The patient was treated with cefazoline 4 × 1 g per day intravenously. One week after aortic repair the patient developed night fevers of 38.5°C. Since cultures of sputum and urine were negative, prosthetic infection was suspected. Gallium scintigraphy showed no tracer concentration in the area of the prosthesis, and intravenous DSA showed no signs of pseudoaneurysm. CT scanning showed a large haematoma in the right hypochondrium which was evacuated through a right retroperitoneal approach (Fig. 2). Culture of the haematoma yielded Salmonella dublin and the patient was subsequently treated with amoxicillin 3 × 1 g per day. Eighteen months after operation the patient remains well, with complete recovery of paralysis and normal peripheral pulses. There are no signs of prosthetic infection and the inflammatory parameters are normal (CRP: 0.48 mg/
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dl). Repeat CT scan shows complete resolution of the inflammatory thickening.

Discussion

The incidence of inflammatory abdominal aortic aneurysms varies from 5 to 23% of all abdominal aortic aneurysms,\textsuperscript{3,4} 90% of patients being men. The aetiology and pathogenesis are uncertain. Several hypotheses have been put forward: smoking seems to be an important aetiologic factor.\textsuperscript{5,6} Periaortic fibrosis probably does not result from microperforations of the abdominal aorta, as no haemosiderin is found in IAAA.\textsuperscript{7} Leakage of blood elements as postulated by Walker et al. is a possible explanation.\textsuperscript{1} Infection seems

Fig. 1. CAT-scan of the inflammatory abdominal aortic aneurysm.

Fig. 2. CAT-scan of the retroperitoneal haematoma, clearly showing the site of aneurysm rupture.
to be unlikely because of the absence of microorganisms in IAAA. Only one case of an IAAA complicated by infection with *Campylobacter fetus* has been published.\(^8\) Escape of lymph from ruptured periaortic lymphatics with aneurysm enlargement may initiate inflammation and subsequent fibrosis of inflammatory aneurysms.\(^9\) A recent immunological theory suggests the presence of antibodies against ceroid, a by-product of the lipoprotein oxidation in atherosclerotic plaques. When it comes into contact with the circulation it may initiate an inflammatory process.\(^10,11\) Rupture is less common than in classic atherosclerotic aneurysms, although it did occur as in our patient. Rupture is mostly found through the posterior wall which is often less involved in the fibrotic process in contrast to true retroperitoneal fibrosis which involves the whole circumference.\(^12,13\)

The role of steroids is controversial.\(^14-16\) Following Baskerville et al.\(^17,18\) we tried corticosteroid therapy with 5 mg Prednisone twice a day to reduce fibrosis and facilitate a later operation. However, except in a low-risk patient, steroids should not be used as a substitute for surgical therapy.\(^19\) Considering the positive blood cultures 3 days later, in our case this treatment was certainly not an ideal choice.

Our patient is the second described case of an infected IAAA. The cultures were positive for *Salmonella dublin*. It is impossible to say whether the aneurysm ruptured due to the first operation,\(^20\) due to steroid therapy or due to the *Salmonella* infection. The aneurysm may be considered a mycotic aneurysm, which are known for their tendency to early rupture. The steroid administration may have enhanced this tendency.\(^21\) It is encouraging that there are, as yet, no signs of prosthetic graft infection.\(^22,23\)

**References**


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