Primary Repair With In-Situ Interposition Graft for Infrarenal Mycotic Aortic Pseudoaneurysm

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Summary

This is a case report of a pseudoaneurysm due to *Salmonella* aortitis in a 52 year old man. The condition is rare and represents one of the few cases reported in Malaysia. The diagnosis was made preoperatively by ultrasonography and computed tomography. This was confirmed at surgery where there was a 3 cm defect at the posterior wall of the aorta at L2/3 level. The aneurysmal sac extended to the retrocrural space at the 12th vertebra level cranially on the right side to the lower border of the 3rd lumbar vertebra caudally. It had a smooth fibrous wall and contained a mixture of organised haematoma and pus. At operation the aneurysm was excised, the affected region was carefully debrided and the aorta grafted with an in-situ in-lay graft. Antibiotic therapy was instituted until clinical response was evident, leukocytosis was reduced and blood culture was negative. However 4 months after surgery, the patient returned in irreversible shock and succumbed to disseminated intravascular coagulation secondary to massive upper gastrointestinal haemorrhage from an aortoduodenal fistula.

Key Words: Aortic aneurysm, Mycotic pseudoaneurysm, *Salmonella*

Introduction

A pseudoaneurysm arising from a ruptured infrarenal mycotic aortitis is rare[1]. The organisms commonly implicated are *Staphylococcus aureus, Salmonella spp.* and *Escherichia coli* which together account for 70% of the infections[2]. Infection may occur on a diseased nonaneurysmal or aneurysmal aorta[3]. The condition is generally silent until complications such as a rupture or massive leakage occurs resulting in serious morbidity and a high risk of mortality[2]. When the leakage is not clinically overt or symptoms are equivocal , radiologic assessment has a role in detecting and evaluating the extent of the disease. Ultrasonography (US) has been shown to be a sensitive modality for detecting an aneurysm, however changes in the aneurysm due to a leakage are often difficult to detect especially when they are minimal[2]. Computed tomography (CT) has now a well established role in the assessment of an aortic aneurysm. It can detect and precisely determine the proximal and distal extents of the aneurysm. It can show even subtle changes of leakage[2]. This modality is now used to assess patients with suspected leakage from their aortic aneurysms and who are clinically stable in Hospital Kuala Lumpur. This case report highlights a rare cause of aortic pseudoaneurysm, the value of US and CT in it's definitive diagnosis and assessment, and emphasises the impact of early surgery and the choice of procedure. In this patient, an interposition graft was used.

Case Report

A 52 year old man was admitted to another hospital for epigastric pain of 5 days duration. A pulsatile mass was detected on abdominal examination by a urologist who made a diagnosis of an aortic aneurysm. In view of the pain the possibility of the aneurysm leaking was considered. The patient was referred to the

Vascular Unit of the Hospital Kuala Lumpur for further management. On admission, he was ambulant, afebrile and apart from tachycardia of 110 / min was haemodynamically stable. Ultrasonographic images were consistent with an. abdominal aortic aneurysm , but signs of leak could not be ascertained because of poor visualisation of the periaortic areas. Computed tomography demonstrated a saccular aneurysm with a maximal diameter of 8 cm at the level of the third lumbar vertebra (L3), associated with a retroaortic haematoma (Figure 1). The haematoma extended cranially on the right side reaching the retrocrural space at twelfth thoracic vertebra (T12) and caudally to the lower border of L3. The remainder abdominal aorta showed changes of atherosclerosis but had a normal calibre throughout. A CT diagnosis of a pseudoaneurysm, probably mycotic, with leaking was made. Biochemical results showed normal blood urea of 9.0 mg/dl and a serum creatinine of 212 IU/L, white cell count of 17,800/ul and an erythrocyte sedimentation rate of 78 mm/hr.

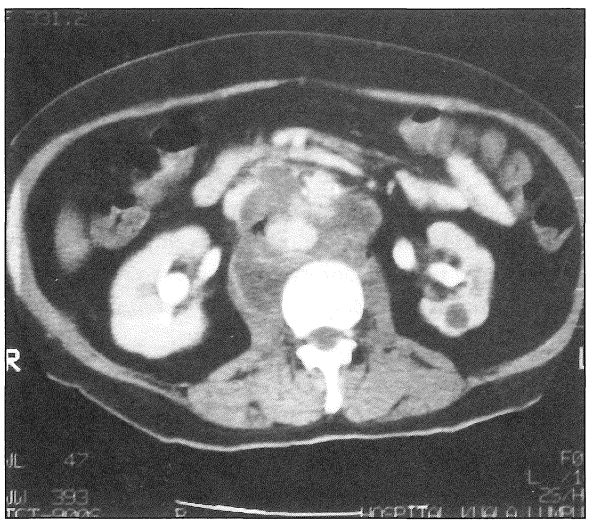

Fig. 1: CT demonstrating the pseudoaneurysm at L1 / L2 level

The patient was hypertensive and diabetic, and on regular medical treatment with atenolol and glibenclamide respectively. He had a history of vesicolitholopaxy for bladder stones in 1991 and percutaneous nephrolithotripsy for renal stones in 1995.

An emergency operation was carried out. At surgery, there was a pseudoaneurysm due to a perforation measuring 3 cm in the posterior wall of the aorta at the level of L2/L3 space. The sac measuring 8 cm in lenght extended cranially to both sides of the suprarenal aorta posteriorly . It had a smooth whitish fibrous wall and contained a mixture of organised heamatoma and infected liquefied haematoma. The aorta was not dilated at the site of the perforation. The rest of the abdominal aorta and the common iliac arteries were of normal calibre. A vascular clamp was applied to the aorta just below the renal arteries and to the left renal vein and inferior mesenteric artery ligated for haemostasis. The contents of the pseudoaneurysm were evacuated and the area flushed with povidone iodine. A Woven Dacron Graft was inserted into the infrarenal aorta which was laid open . Anastomosis was accomplished using Prolene 3 "0" continuous sutures proximally and distally. An omental patch was sandwiched between the graft and the retroperitoneal area and the wall of the aorta was partially closed over the omentum and graft.

Postoperatively the patient was nursed in the Intensive Care Unit for 48 hours. He was promptly started on cefuroxime and metrohidazole. His blood culture did not grow any organism. The culture from the infected haematoma, however, grew *Salmonella spp.* which was sensitive to ampicillin, ceftriaxone, chloramphenicol , ciprofloxacin, cotrimoxazole, gentamicin and tetracyclin. The antibiotic therapy was changed appropriately to ceftriaxone for 2 weeks. He recovered well during the immediate postoperative period and his renal function remained stable. He was discharged well 18 days after surgery.

Four months after surgery, the patient was readmitted with severe haematochezia and within the hour of admission was rushed into the operating room. He had blood transfusion and aggressive fluid resuscitation. A laparotomy was performed and at surgery he was found to have an aortoenteric fistula from the proximal graft anastomotic line to the 3rd part of the duodenum. During the procedure he deteriorated rapidly and went into shock before adequate clamping of the aorta could be achieved. The patient continued to bleed profusely and subsequently developed disseminated intravascular coagulation. He finally succumbed to shock.

Discussion

The term "mycotic" aneurysm was first used by Sir William Osler in 1885 . He had attributed this condition to valvular vegetations lodged on to the aortic wall which resulted in aneurysmal degeneration[3]. The term "mycotic" is inappropriate, because it denotes arterial aneurysm due to both bacterial and fungal infections. Besides, some patients do not have endocardial disease , which suggests that the infected aneurysm developed primarily in the aortic wall[3]. This view is supported by evidence that inoculation of microbials into a damaged intima triggers periarteritis and leads to aneurysmal degeneration. Preexisting damaged intima exists in atherosclerosis, coarctation , chronic dissection, cystic medial necrosis and in immunocompromised individuals[1,2,3].

In the past, assessment of aortic aneurysms relied primarily on angiography. This technique, however, is invasive and has its own risks and complications[2]. The emergence of sectional imaging modalities such as US, CT and magnetic resonance imaging (MRI) has facilitated the assessment of this condition safely[2]. Ultrasonography has a sensitivity of 100 % in the detection of aortic aneurysm. However, difficulties may be encountered when more precise information on the cranial and caudal extent and possibility of leaking are required[2]. At our hospital CT is generally done following equivocal US findings. It is the primary investigation when leaking of the aorta is clinically suspected in patients with nonspecific symptoms and who are haemodynamically stable.

Once a leaking aneurysm is diagnosed, emergency surgery is mandatory as the aneurysm will eventually rupture at some stage. In that clinical setting the risk of mortality is very high. In addition, the infective component warrants prompt antibiotic therapy. Broad spectrum antibiotics should be started first. This regime can be changed depending on results of the blood culture and, or the aneurysmal content as demonstrated in this patient.

Excision of the aorta and meticulous debridement of the infected region with interposition grafting is an option at surgery[2]. It has some benefits and some disadvantages[1,2,3]. Some of the delayed complications of surgery include fistula between the proximal graft anastomotic line and transverse colon[2], and persistence of infection from incomplete debridement of infected tissue[1]. To reduce these complications, it has been suggested that appropriate antibiotics be continued postoperatively intravenously for 6 weeks[3] and the choice of surgery be a remote distal bypass (e.g. aorto-bifemoral, axillo-bifemoral) followed by complete excision of the infected tissues[2,3]. Some authors advocate lifelong antimicrobial prophylaxis[2]. Following appropriate antibiotic treatment, our patient was afebrile 2 days after surgery and remained so after the antibiotics was discontinued after 14 days. We found our experience identical to the case reported by Onoda *et. al*[2], where he found that his patient ultimately required revision surgery after development of an aortoenteric fistula. Unfortunately we were not able to save our patient despite aggressive resuscitation.

References

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