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## [症例報告]Suprarenal mycotic aortic aneurysm : Excision and in situ graft reconstruction

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## Suprarenal mycotic aortic aneurysm : Excision and in situ graft reconstruction

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### ABSTRACT

We report the case of a 54-year-old man with a suprarenal mycotic aortic aneurysm who underwent successful resection and in situ replacement. He had developed mycotic aneurysm after medical treatment for septicemia caused by *Klebsiella pneumoniae* infection. The aneurysm involved four major visceral branches and was exposed through a thoracoabdominal approach. Following the excision of the aneurysm, graft replacement of the aorta and all visceral arteries was performed using femoro-femoral bypass. The graft was covered with omental flap. The patient has remained well 18 months after the operation without any signs of graft infection. We conclude that in situ reconstruction combined with omental flap for suprarenal mycotic aortic aneurysm is an appropriate procedure with satisfactory long term results. *Ryukyu Med. J.*, 17(1)65~68, 1997

Key words: mycotic aneurysm, suprarenal aorta, graft replacement, omental flap

### INTRODUCTION

Mycotic aneurysms are uncommon and associated with high incidence of morbidity and mortality, but can be managed successfully if diagnosed early and treated by surgery<sup>1,2)</sup>. The surgical management of this disorder is however controversial. Traditional surgical procedure consists of arterial ligation, aneurysm excision with wide local debridement and extraanatomic bypass through clean, non-infected tissue<sup>3,4)</sup>. However recent reports suggest that in situ reconstruction can be undertaken successfully for mycotic aneurysm, especially on younger patients in good condition without signs of local suppuration<sup>5-7)</sup>. Although the merits of extraanatomic bypass and in situ graft replacement for treatment of mycotic aneurysms continued to be debated, the option of extraanatomic bypass is rarely available for mycotic aortic aneurysms involving the visceral branches<sup>8)</sup>. In this article we describe a case with a suprarenal mycotic aortic aneurysm successfully treated by in situ graft replacement. The surgical management is also discussed.

### CASE REPORT

A 54-year-old man was admitted to a local hospital with several-days history of fever, night sweats, anorexia and malaise. Significant laboratory studies included: white blood cell count, 19,000/mm<sup>3</sup> with shift to left, hematocrit, 30% and C-reactive protein test (CRP),

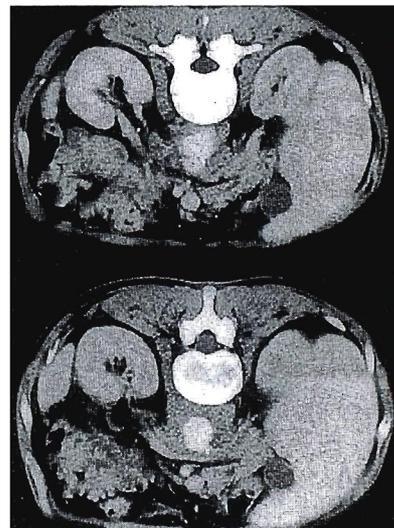


Fig. 1 An abdominal computed tomography (CT) scanning, the day before admission, showing a saccular suprarenal aortic aneurysm with periaortic edema and hypofunctioning the right kidney.

15.2mg/dl. Blood culture grew *Klebsiella pneumoniae*, therefore the patient received a three week course of antibiotic therapy and was subsequently discharged without symptoms. One week later, the patient was readmitted to the hospital with complaint of constant abdominal pain radiating to the back. Abdominal computed tomography (CT) scanning demonstrated an aortic aneurysm at the level of visceral arteries and

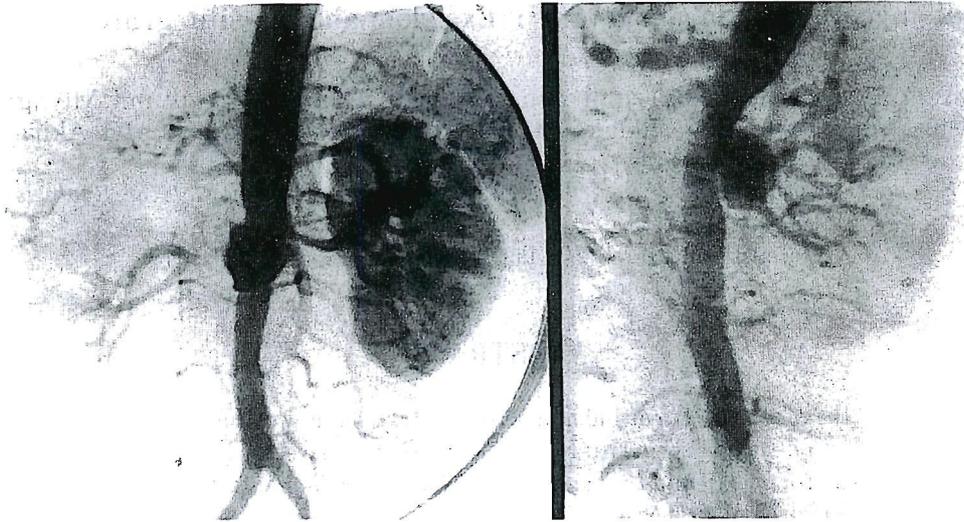


Fig. 2 An aortogram (left: AP view, right : RAO view) demonstrating a eccentric and saccular aneurysm of the suprarenal aorta and stenosis of the right renal artery.

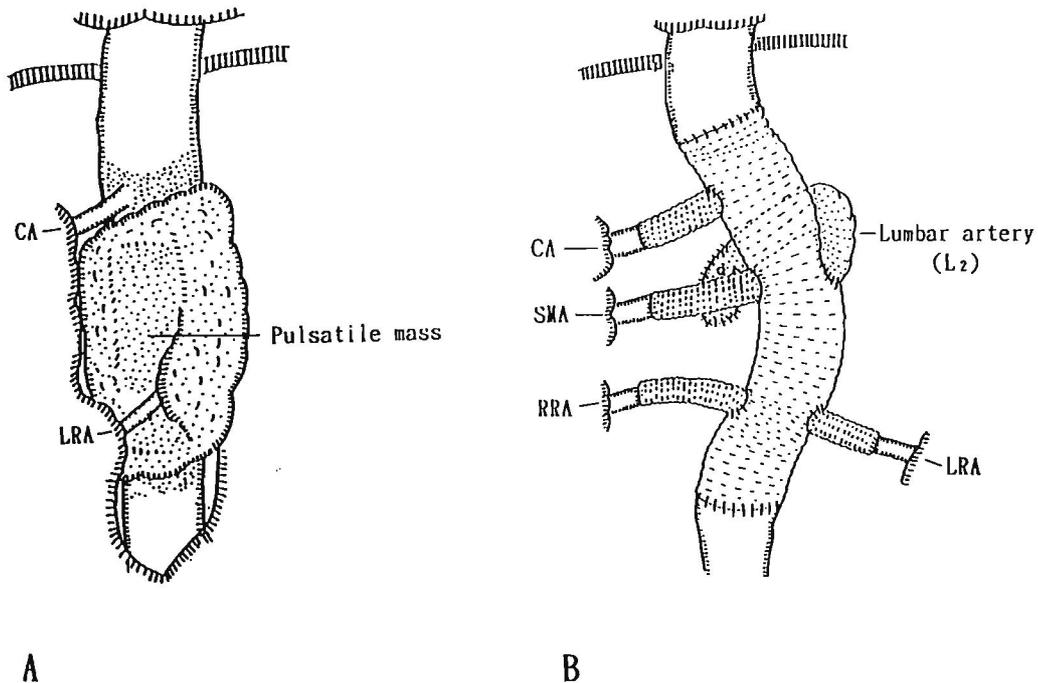


Fig. 3 Suprarenal mycotic aortic aneurysm. (A) Drawing made before the graft replacement. (B) Drawing made after the operation. CA: Celiac axis, SMA: Superior mesenteric artery, LRA: Left renal artery, RRA: Right renal artery.

hypofunctioning of the right kidney (Fig. 1). He was transferred to our institution for further evaluation.

On admission, the patient was afebrile but appeared uncomfortable. Physical examination revealed a pulsatile mass with moderate tenderness in the upper region of the abdomen. Aortography demonstrated a saccular aortic aneurysm arising from the aorta at the renal arteries level and stenosis of the right renal artery (Fig. 2). A preoperative diagnosis of an infected aortic aneurysm was made and the operation was performed on September 9, 1995. Through a spiral opening

approach, the proximal segment of the abdominal aorta was exposed with medial visceral rotation. An aneurysm, approximately 5 cm in diameter, was located in the proximal segment of the abdominal aorta (Fig. 3). No rupture or purulent materials were evident, but fibrous adhesion with extensive inflammatory reaction was identified. There was also evidence of involvement of infective process of the aortic wall at the celiac axis level (Fig. 3A). Intraoperative Gram stain result was negative for bacteria but did show some white blood cells and lymphocytes. No organisms were cultured

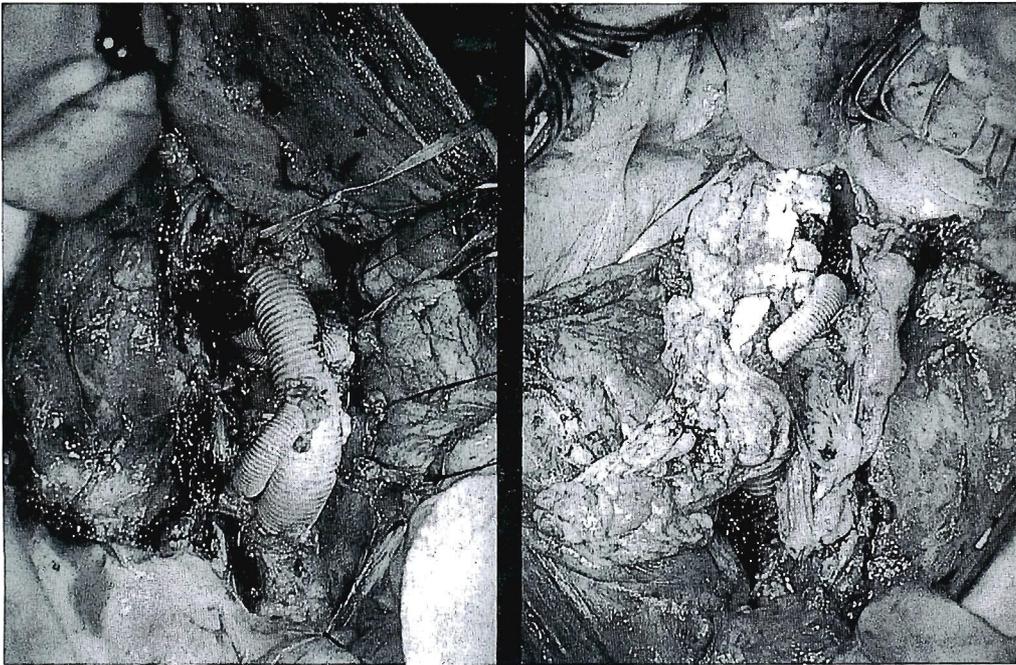


Fig. 4 Intraoperative pictures. Completion of aortic graft replacement including the visceral arteries and lumbar artery reattachment (left). The graft is covered with the omental flap (right).

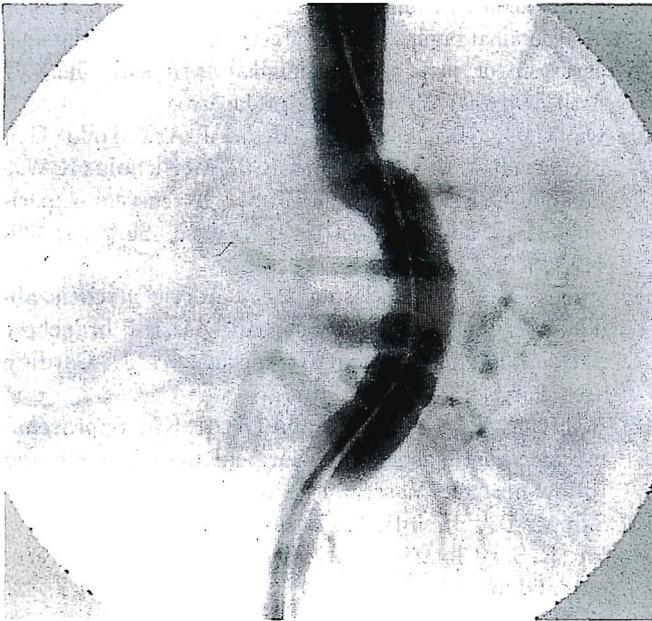


Fig. 5 A postoperative aortogram showing good function of the replaced aorta with reattached visceral arteries

from the wall of infected aorta. Using femoro-femoral bypass the mycotic aneurysm was opened, and the infected aorta was widely resected. A dacron graft with side-arms for major visceral arteries and lumbar artery was used to reconstruct the aorta from the supraceliac to infrarenal level (Fig. 3B, Fig. 4). During this procedure a selective visceral arteries perfusion was used for organs preservation<sup>9</sup>. Thereafter the aortic pros-

thesis was covered with omental flap from surrounding structures (Fig. 4). The patient had an uneventful postoperative course. Intravenous broad -spectrum antibiotics were continued until the patient resumed oral intake. Postoperative aortogram showed good function of the reconstructed aorta and visceral arteries (Fig. 5). The patient has been well without any signs of graft infection 18 months after the surgery.

## DISCUSSION

Mycotic aneurysms continue to present a diagnostic and therapeutic challenge to vascular surgeons. Although the etiology and associated microbiology have changed, it remains a significant clinical problem<sup>2</sup>. Oz et al<sup>10</sup> noted a significant decrease in the mortality rate associated with bacterial arteritis from 75% in the 1960s to 40% by 1984. They therefore suggested that early diagnosis, proper antibiotic management, and appropriate surgery should lower this rate even further. The classification of aneurysms associated with arterial infection is based on the mechanism of formation, and consists of embolomycotic mechanism, microbial arteritis, infection of preexisting aneurysms, traumatic and contiguous arterial infection<sup>2</sup>. The patient presented here had a septic condition without evidence of bacterial endocarditis, consequently belonged to primary aortic aneurysm caused by microbial arteritis.

Although specific operative techniques will vary depending on specific vessels involved, certain general principles of management should be followed. The aneurysm

should be resected in its entirety with wide debridement of surrounding infected tissue and broad-spectrum antibiotic irrigation of the aneurysm bed.

A review of the surgical literature regarding treatment of mycotic aneurysms can be confusing. Thoracic surgeons generally recommend in situ graft replacement<sup>5,7)</sup>. Most of vascular surgeons prefer excision, local debridement, and extraanatomic bypass<sup>3,4)</sup>. The last form of treatment was not possible in most patients with suprarenal mycotic aneurysm because of the location of the aneurysm, opposite the origin of the major vessels. The mycotic aneurysm involving the proximal abdominal aorta and its visceral branches are rare indeed and the operative mortality is high<sup>5,6,8,11-14)</sup>. Chan *et al.*<sup>6)</sup> noted that early operation without regard to the status of the infection evolved as a principle of therapy in these patients.

Despite major progress in the treatment of thoracoabdominal aneurysm in recent years, postoperative renal dysfunction and paraplegia is still the most feared complications<sup>5,6,10)</sup>. Using the selective visceral perfusion technique<sup>9)</sup>, this patient had no signs of renal dysfunction. The omental flap has been used for poststernotomy mediastinitis with satisfactory results<sup>15)</sup>. In our patient, the graft prosthesis was also covered with the omental flap for the prevention of graft infection.

The most frequent species cultured in association with mycotic aneurysms were *Salmonella*, *Staphylococcus aureus* and *Streptococcus* species. Although the *Klebsiella* mycotic aneurysm found in this patient is rare, it has also been reported previously<sup>2,5)</sup>. Due to the rarity of mycotic aneurysms of aorta, definitive statements regarding the duration of antibiotic use postoperatively cannot be made. However, late infection has been reported in patients who did not continue permanent antibiotic therapy<sup>6)</sup>. Therefore lifelong administration of oral antibiotics is recommended.

In conclusion mycotic aneurysm of suprarenal aorta cases are rare but potentially fatal unless diagnosis is made and appropriate surgical management instituted. We believe that the technique described here, may be a useful procedure for patients with suprarenal mycotic aortic aneurysm.

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