

Pseudoaneurysm of the Iliac Artery Secondary to *Aspergillus* Infection After Kidney Transplantation

Kuang-Yi Liu¹, Pei-Jiun Tsai^{2,3}, Kuang-Liang King^{2,3}, Tien-Hua Chen^{2,3*}, Yi-Ming Shyr^{2,3}, Cheng-Hsi Su^{2,3}

¹Department of Surgery, Tao Yuan Armed Forces General Hospital, Taoyuan, and ²Division of General Surgery, Department of Surgery, Taipei Veterans General Hospital and ³National Yang-Ming University School of Medicine, Taipei, Taiwan, R.O.C.

Infectious complications are the top causes of morbidity and mortality in patients who undergo renal transplantation. We report a patient who received a cadaveric renal transplant in Mainland China. One year post-transplantation, the patient had right buttock pain with radiation to the leg. Swelling and tenderness over the right groin was also found. Magnetic resonance imaging revealed a multilobulated cystic lesion, about 8 × 7 cm, at the right iliac fossa and presacral region extending to the posterior aspect of the graft kidney and up to the right psoas muscle. Drainage of the intra-abdominal abscess was performed. The abscess culture showed presence of *Aspergillus* spp. The patient had received steroids, tacrolimus and mycophenolate mofetil, which could be a risk factor for fungal infection. The cause of *Aspergillus* infection in our patient remains unclear. It may have been due to immune system insufficiency of the patient rendering the patient prone to infection. Pseudoaneurysm formation of the internal iliac artery following *Aspergillus* infection after kidney transplantation is rarely reported. Although it is a dilemma, once a severe situation such as pseudoaneurysm with aspergillosis presents, graft removal is suggested. [*J Chin Med Assoc* 2009;72(12):654–656]

Key Words: *Aspergillus*, pseudoaneurysm, renal transplant

Introduction

Infectious complications are the top causes of morbidity and mortality in patients who undergo renal transplantation.^{1,2} Though fungi account for only 5% of all infections in renal transplant recipients, fungal infections have a high mortality rate. *Candida* spp. and *Aspergillus* spp. are the most frequently involved organisms in these patients.³ *Aspergillus* is ubiquitous in the environment but rarely causes invasive disease in a healthy host. In immunosuppressed transplant recipients, however, it can be a dangerous opportunistic pathogen that is capable of inducing fulminant clinical disease. In this study, we report a case of renal transplantation complicated with presacral abscess induced by *Aspergillus* infection and pseudoaneurysm of the internal iliac artery.

Case Report

A 34-year-old woman had end-stage renal disease secondary to immune-related renal disease. She had been undergoing periodic hemodialysis for 11 years. She received a cadaveric renal transplant in Mainland China. The renal artery was anastomosed end-to-end onto the internal iliac artery. Immunosuppression with methylprednisolone, antithymoglobulin, tacrolimus, and mycophenolate mofetil were given. No rejection history was noted. The patient was discharged with blood urea nitrogen (BUN) of 9.08 mmol/L, and serum creatinine and tacrolimus of 0.8 mg/dL and 7.9 ng/mL respectively. During outpatient department follow-up, she received medication with tacrolimus 4 mg per oral every 12 hours, mycophenolate mofetil 500 mg per



*Correspondence to: Dr Tien-Hua Chen, Division of General Surgery, Department of Surgery, Taipei Veterans General Hospital, 201, Section 2, Shih-Pai Road, Taipei 112, Taiwan, R.O.C.
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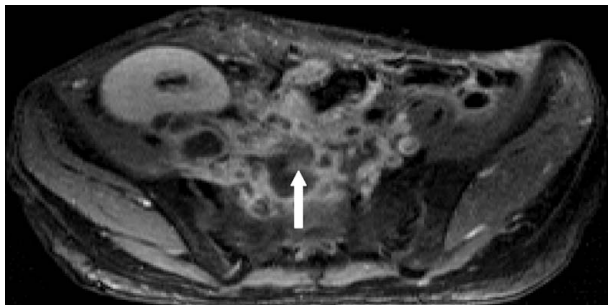


Figure 1. Magnetic resonance imaging shows a multilobulated cystic lesion (white arrow) measuring about 8 × 7 cm in size at the right iliac fossa and presacral region, extending to the posterior aspect of the graft kidney and up to the right psoas muscle (5 × 2 cm).

oral every 12 hours, and methylprednisolone 8 mg per oral once daily.

One year post-transplantation, the patient had right buttock pain with radiation to the leg (sciatica). Swelling and tenderness over the right groin was also found. Magnetic resonance imaging revealed a multilobulated cystic lesion, about 8 × 7 cm, at the right iliac fossa and presacral region extending to the posterior aspect of the graft kidney and up to the right psoas muscle (Figure 1). Open drainage of the intra-abdominal abscess was performed.

The abscess culture and biopsy of soft tissue of the right retroperitoneum showed presence of *Aspergillus* spp., and the pathology of soft tissue showed aspergillosis (Figure 2). Fluconazole 200 mg daily was given for 21 days. Ten days later, the patient received a 2nd drainage operation due to residual abscess. Graft function deteriorated gradually 2 weeks after the 2nd operation, with creatinine level up to 6.2 mg/dL. Renal sonography revealed a 5–7-cm mass over the presacral region at the sacrum 1–2 level. A pseudoaneurysm 5 cm in size over the right internal iliac artery was confirmed by angiography (Figure 3). Due to bleeding of the huge aneurysm (which was 5 cm in size), it was resected. Having lost function, the graft was removed and the internal iliac artery was ligated. Hemodialysis was initiated again. Amphotericin B 25 mg daily was given for 44 days. Due to improvement of her general condition, the patient was discharged. She received oral itraconazole 200 mg per day for 48 days, which was then stopped due to liver toxicity.

Further drainage of the intra-abdominal abscess was performed 3 months after discharge due to residual abscess. Amphotericin B 25 mg was given again for residual *Aspergillus* infection. The patient's current condition is stable, and she has received hemodialysis without residual abscess in the most recent outpatient department follow-up.

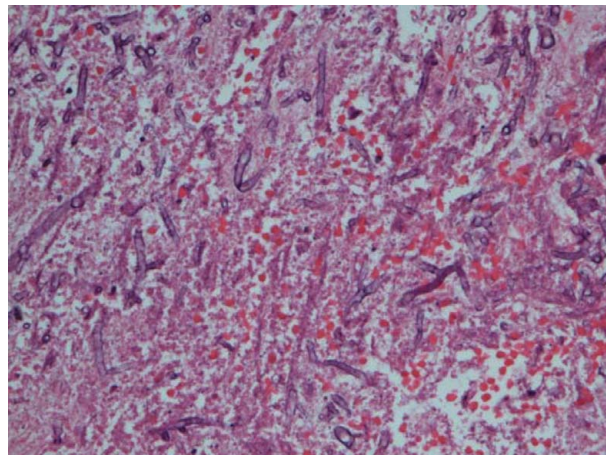


Figure 2. Section shows soft tissue of aneurysm with chronic inflammatory cell infiltration and aggregates of fungi with septated hyphae and acutely angled branches. Morphology is consistent with aspergillosis.



Figure 3. Angiography shows a huge aneurysm (white arrow) arising from the right internal iliac artery, measuring about 5 cm in size. The graft renal artery is not opacified and there is no perfusion of the graft kidney.

Discussion

Infectious diseases are major complications in patients who undergo organ transplantation. Post-transplantation-acquired infections are usually from infected grafts, the extraction procedure of the graft, organ preservation, and implantation.⁴ Rubin⁵ reported a 3-phase calendar of infection in patients who have undergone renal transplantation: (1) in the 1st month post-transplantation, the infections are from technical complications of surgery, or from endotracheal tubes, urinary catheters and intravenous lines, and the pathogens are usually *Staphylococcus aureus*, *Candida* spp. or Gram-negative bacilli; (2) 1–6 months after transplant,

the infective diseases are related to epidemiologic exposures, the occurrence of opportunistic infections due to organisms such as *Pneumocystis carinii*, *Listeria monocytogenes* and *Aspergillus fumigatus*; (3) >6 months post-transplantation, infections are related to viral infection, with the pathogens being *Cryptococcus neoformans*, *Pneumocystis carinii*, *Listeria monocytogenes* or *Nocardia asteroides*.

Aspergillus spp. is a respiratory pathogen. The incidence of aspergillus infection in renal transplantation is about 2.0–3.9%.^{6,7} *A. fumigatus* is the most often isolated species, accounting for 85% of cases.⁶ *A. niger*, *A. flavus* and *A. terreus* have also been found in invasive aspergillosis. Pulmonary infection is the most common form of invasive disease, but dissemination to the central nervous system and other sites may occur.⁸ Infected patients generally present with 1 of 3 clinical patterns: (1) cavitory lung disease; (2) diffuse pulmonary disease; or (3) central nervous system disease.⁶ The use of sirolimus alone or with mycophenolate appeared to be important predisposing factors to infection by aspergillosis.^{6,9} The median time interval from transplantation to the clinical presentation of invasive aspergillosis was 2.5–3.5 months.^{6,9} The diagnosis of aspergillosis depends on clinical judgment and is difficult to confirm without tissue biopsy and culture confirmation.¹⁰ Premortem diagnosis was made in only 56% of cases.⁶ *Aspergillus* infection in renal transplantation is dangerous, with a mortality rate of 40–86%.^{2,11–15}

Our patient had received the kidney from a multiple-organ donor. The other organ recipients did not get *Aspergillus* infection. So the cause of the infection in our patient was not likely to be from organ extraction, preservation or implantation. The patient had received high doses of steroids, tacrolimus and mycophenolate mofetil, which could be a risk factor for fungal infection. According to Rubin's report,⁵ the presentation of invasive aspergillosis was at 2.5–3.5 months post-transplantation and possibly due to the use of immunosuppressive drugs. However, our patient got aspergillosis 1 year after renal transplantation. So the cause of *Aspergillus* infection in our patient remains unclear, but may be due to immune system insufficiency.

Successful treatment of post-transplantation infection depends on early diagnosis, aggressive antifungal treatment, and reducing immunosuppressive treatment.¹ The mainstay of therapy for this infection is the use of amphotericin B. The peak dosage goal is 0.75–1.0 mg/kg/day, with total dose in the adult ranging from 1,200 mg to 3,000 mg.^{2,3} The response rate of *Aspergillus* infections to amphotericin B was 55% after 14 days of treatment.^{6,7} Liposomal amphotericin B should be used when nephrotoxicity must be avoided.⁸

Itraconazole, an orally active triazole antifungal drug, can be used in outpatients for *Aspergillus* infection.⁹

Pseudoaneurysm formation of the internal iliac artery following *Aspergillus* infection after kidney transplantation is rarely reported. Our literature review found that Garrido et al¹⁶ had reported 2 kidney transplant recipients (from the same donor) who developed pseudoaneurysm formation of the iliac artery secondary to *Aspergillus* infection. One recipient died due to delayed diagnosis and treatment. Although it is a dilemma, once a severe situation such as pseudoaneurysm with aspergillosis presents, graft removal is suggested.¹⁶

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