



## After Kidney Transplantation, Mycotic Pseudo-aneurysm: Report of Two Cases

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### Abstract

**Background:** Vascular complications following kidney transplantation can lead to graft loss. Here, we present two cases of extra renal mycotic pseudo-aneurysm occurring after kidney transplantation.

**Methods:** Case 1 involved a 54-year-old man who developed a pseudo-aneurysm 60 days post-transplantation, while Case 2 was a 48-year-old woman diagnosed with a pseudo-aneurysm 5 months post-transplantation.

**Results:** In Case 1, the patient had undergone a deceased-donor kidney transplant with an end-to-side external iliac arterial anastomosis. Eight days after transplantation, reconstruction was performed due to rupture and severe bleeding. At 60 days post-transplantation, the patient presented with high serum creatinine levels, and Doppler ultrasonography revealed a pseudo-aneurysm at the arterial graft anastomosis along with post-anastomotic renal artery stenosis. Treatment included surgical excision of the pseudo-aneurysm, vascular reconstruction, and fluconazole therapy, with mycologic culture confirming *Candida albicans*. Case 2 experienced non-disabling intermittent claudication at 5 months post-transplantation, and a pseudo-aneurysm was later detected on Doppler ultrasonography and computed tomographic angiography. Treatment involved renal artery thrombectomy and common iliac bypass to the renal artery hilum using reversed ipsilateral long saphenous vein. Operative samples also revealed *C. albicans*, and fluconazole therapy was initiated. Both patients had favourable outcomes, with preservation of the kidney allografts.

**Conclusions:** Extrarenal mycotic pseudo-aneurysms following kidney transplantation warrant early detection and intervention. Preservation of the kidney graft can be achieved through surgical management and antifungal therapy.

**Keywords:** Vascular complications; Arterial bleeding; Transplant recipient; Transplant surgery; Infection; Fungal infection; Vascular injury; Graft dysfunction; Surgical complications; Imaging techniques; Angiography; Vascular intervention; Embolization; Reoperation; Immunosuppression

### Introduction

Since the first kidney transplant in 1954, significant advancements in surgical techniques and immunosuppressive therapies have made kidney transplantation the primary treatment for individuals with end-stage renal disease. However, approximately 10% of kidney transplant recipients experience complications. Medical complications include acute tubular necrosis, acute or chronic allograft rejection, and nephropathy resulting from immunosuppressive medications. Urologic complications encompass ureteral obstruction, urinoma, abscess, and lymphocele formation. Vascular complications, which can lead to graft loss, include renal artery thrombosis or stenosis, renal vein thrombosis, and other less common issues such as aneurysm, hematoma, and arteriovenous fistula. Pseudo-aneurysms are rare complications following kidney transplantation, often occurring at anastomotic sites or within the renal parenchyma, typically resulting from infection or technical errors. Although mycotic aneurysms account for a small percentage of cases after kidney transplantation, rupture of an anastomotic pseudo-aneurysm can lead to severe bleeding and death, necessitating emergency intervention such as graft nephrectomy. Moreover, the treatment of mycotic pseudo-aneurysms after kidney transplantation often entails high morbidity and graft failure. Literature on this condition is limited, with few studies or isolated case reports available. There remains debate regarding the etiology, prevalence, treatment, and prognosis of mycotic pseudo-aneurysms after kidney transplantation, underscoring the importance of early diagnosis for successful therapy. In our report, we describe two cases of extrarenal mycotic pseudo-aneurysm successfully treated through early intervention, leading to graft preservation, improved

outcomes, and patient survival. This report aims to highlight the successful management of these cases and contribute to the existing knowledge on this rare complication [1,2].

### Material and Methods

#### Case 1:

Case 1 was a 54-year-old man with end-stage renal disease due to sarcoidosis and scleroderma. Eight days after initiating peritoneal dialysis, he underwent deceased-donor kidney transplantation, placing the left kidney into the right iliac fossa. The surgical procedure, including an end-to-side anastomosis of the graft vessels with the recipient's external iliac artery and vein, proceeded without complications. The surgical approach involved an extraperitoneal exposure through a Gibson incision. Cold ischemia time was 16.1 hours, with warm ischemia time of 32 minutes. Immediate graft function was indicated by urine output and postoperative serum creatinine levels. Immunosuppressive therapy consisted of tacrolimus, mycophenolate mofetil, prednisone, and basiliximab. Antibiotic prophylaxis was administered for 48 hours post-transplantation (vancomycin 1 g/day, cefotaxime 2 g/day). Shortly after surgery, the patient developed fever, and blood cultures revealed *Serratia marcescens* infection, which was

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treated with intravenous meropenem [3]. On the eighth day post-transplantation, the patient experienced hemorrhagic shock due to rupture of the arterial anastomosis. Surgical intervention involved in situ reconstruction of the arterial anastomosis. The patient required hemodialysis for 20 days, with delayed but ultimately effective diuresis recovery. Sixty-two days post-transplantation, a laparotomy revealed a pseudo-aneurysm at the right external iliac artery and proximal portion of the graft artery. The pseudo-aneurysm was meticulously dissected, and vascular control was established proximally and distally. The right saphenous vein was prepared for use as a vascular graft, and a bypass was performed from the common iliac artery to the distal graft artery. Complete resection of the pseudo-aneurysm was performed, followed by end-to-end reconstruction of the external iliac artery [4].

### Case 2:

Case 2 was a 48-year-old woman with hereditary nephropathy who received a deceased-donor left kidney transplant into the right iliac fossa via a Gibson incision and extraperitoneal exposure. Cold ischemia time was 22.1 hours, with warm ischemia time of 44 minutes. Immunosuppressive therapy included tacrolimus, mycophenolate mofetil, and steroids. She received antithymocyte globulin for postoperative steroid-resistant rejection, leading to improvement in her creatinine levels. Pathological examination of the graft biopsy revealed *Citrobacter koseri* infection, treated with systemic meropenem [5]. Five months post-transplantation, the patient developed non-disabling intermittent claudication in the right lower limb and experienced an acute rise in serum creatinine levels. No signs of systemic infection were noted. Color-coded Doppler ultrasonography revealed enlargement of the arterial anastomosis and occlusion of the right external iliac artery. CT angiography confirmed ischemia of the upper pole of the graft, thrombosis within the renal artery, a pseudo-aneurysm at the arterial anastomosis (measuring 30.9 × 18.2 mm), and occlusion of the right external iliac artery [6].

### Discussion

These two cases exhibited mycotic pseudo-aneurysms following kidney transplantation, confirmed through imaging studies and culture of the resected pseudo-aneurysm. In Case 2, the claudication was not disabling, and limb revascularization was unnecessary. Vascular complications are a significant cause of kidney allograft failure, occurring in 3-15% of kidney transplants, more frequently after deceased-donor than living-donor transplantation, and with allografts featuring multiple vessels [7]. Fungal infections can affect 5-20% of all solid organ transplants and 5% of kidney transplants. These infections may stem from donor tissue or, more commonly, from exogenous sources during procurement and transplantation, such as contaminated preservation fluid. *Candida* species infections typically manifest within two months post-transplantation and can lead to arterial complications, major bleeding, sepsis, and mortality. Notably, fungal arteritis associated with *Candida* from preservation fluid has led to significant complications, including graft loss and death. Early detection of fungal contamination in preservation fluid may prompt preemptive nephrectomy, although conservative management may also be viable and compatible with patient survival [8].

Among fungal vascular complications after kidney transplantation, extrarenal mycotic pseudo-aneurysms are associated with high morbidity and mortality, but optimal therapeutic approaches are debated. Regardless of the pathogen, most mycotic pseudo-aneurysms after kidney transplantation involve the anastomosis between the recipient renal artery and the donor external iliac artery. These pseudo-aneurysms may be asymptomatic and incidentally detected

during routine follow-up or present with fever, anemia, abdominal pain, pulsatile mass, or hemorrhagic shock. Imaging modalities like color-coded Doppler ultrasonography aid in diagnosis, often revealing inflow within the pseudo-aneurysm. Treatment guidelines for mycotic pseudo-aneurysms after kidney transplantation are lacking, and options are controversial [9,10].

### Conclusion

In our experience, early detection and intervention are crucial for kidney allograft preservation and patient survival. Literature review indicates that many cases of post-transplantation mycotic pseudo-aneurysms undergo allograft nephrectomy due to chronic rejection, graft dysfunction, and infection. Treatment options include surgical repair, endovascular intervention, and percutaneous ultrasound-guided thrombin injection. Successful treatment involves radical debridement of infected tissue, long-term antifungal therapy, and delicate vascular reconstruction using autologous or allogeneic material to prevent graft loss. In summary, the treatment of post-transplantation mycotic pseudo-aneurysms involves excision of infected tissue, arterial reconstruction with autologous tissue, and long-term antifungal therapy, resulting in successful kidney allograft preservation. Transplant nephrectomy may not always be necessary, and treatment decisions should be individualized.

### Acknowledgments

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### Conflict of interest

None

### References

1. Siegel M, Barlowe T, Smith KD, Chaidarun SS, LaBarre N, et al. (2020) Islet autotransplantation improves glycemic control in patients undergoing elective distal pancreatectomy for benign inflammatory disease. *Clin Transplant* 34: 13891.
2. Tanheco YC, Weisberg S, Schwartz J (2016) Pancreatic islet autotransplantation for nonmalignant and malignant indications. *Transfusion* 56: 761-770.
3. Balzano G, Maffi P, Nano R, Mercalli A, Melzi R, et al. (2016) Autologous Islet Transplantation in Patients Requiring Pancreatectomy: A Broader Spectrum of Indications Beyond Chronic Pancreatitis. *Am J Transplant* 16: 1812-1826.
4. Chaouch MA, Leon P, Cassese G, Aguilhon C, Khayat S, et al. (2022) Total pancreatectomy with intraportal islet autotransplantation for pancreatic malignancies: a literature overview. *Expert Opin Biol Ther* 22: 491-497.
5. Zureikat AH, Nguyen T, Boone BA, Wijkstrom M, Hogg ME, et al. (2015) Robotic total pancreatectomy with or without autologous islet cell transplantation: replication of an open technique through a minimal access approach. *Surg Endosc* 29: 176-183.
6. Muratore S, Zeng X, Korc M, McElyea S, Wilhelm J, et al. (2016) Metastatic Pancreatic Adenocarcinoma After Total Pancreatectomy Islet Autotransplantation for Chronic Pancreatitis. *Am J Transplant* 16: 2747-2752.
7. Bhayani NH, Enomoto LM, Miller JL, Ortenzi G, Kaifi JT, et al. (2014) Morbidity of total pancreatectomy with islet cell auto-transplantation compared to total pancreatectomy alone. *HPB (Oxford)* 16: 522-527.
8. Morgan KA, Nishimura M, Uflacker R, Adams DB (2011) Percutaneous transhepatic islet cell autotransplantation after pancreatectomy for chronic pancreatitis: a novel approach. *HPB (Oxford)* 13: 511-516.
9. Jin SM, Oh SH, Kim SK, Jung HS, Choi SH, et al. (2013) Diabetes-free survival in patients who underwent islet autotransplantation after 50% to 60% distal partial pancreatectomy for benign pancreatic tumors. *Transplantation* 95: 1396-1403.
10. Bolzano G, Maffi P, Nano R, Zerbi A, Venturini M, et al. (2013) Extending indications for islet autotransplantation in pancreatic surgery. *Ann Surg* 258: 210-218.