

## **Kidney Retransplantation with Third Graft and No Nephrectomy- A Successful Surgical Challenge Case Report**

**Arthur Degani Ottaiano**

Faculdade de Ciencias medicas,  
Univesidade estadual de Campinas  
(UNICAMP), Campinas, São Paulo, Brazil

**Bruno Ricardo Di Domenico**

Faculdade de Ciencias medicas,  
Univesidade estadual de Campinas  
(UNICAMP), Campinas, São Paulo, Brazil

**Natalia Dalsenter Avilez**

Faculdade de Ciencias medicas,  
Univesidade estadual de Campinas  
(UNICAMP), Campinas, São Paulo, Brazil

**Marilda Mazzali**

Faculdade de Ciencias medicas,  
Univesidade estadual de Campinas  
(UNICAMP), Campinas, São Paulo, Brazil

**Marcelo Lopes Lima**

Faculdade de Ciencias medicas,  
Univesidade estadual de Campinas  
(UNICAMP), Campinas, São Paulo, Brazil

### **ABSTRACT**

Renal transplant is the gold standard treatment for patients with end-stage renal disease. Currently, some cases that were previously considered contraindications have become possible to perform. There is no clear limit to the maximum number of retransplants in the literature. In this study, we present the report of a patient who underwent a third renal transplant after the failure of the two previous ones without performing nephrectomy or transplantectomy. A 54-year-old man had undergone two previous kidney transplants (in 2014 and 2018), with failure of both grafts. In 2022, he was admitted again to undergo a third kidney transplant. There was adequate space for vascular anastomosis with the graft, with few calcifications upon palpation and adequate space to accommodate the donated kidney. Vascular anastomoses and modified Lich-Gregoir ureteral reimplantation occurred without complications. There is a debate about the benefit of undergoing subsequent transplants or keeping the patient on dialysis, with little literature available. There is no established theoretical limit to the number of kidneys transplanted in a single individual. Occupied iliac fossae remain a true surgical challenge, especially in

**cases of third or fourth kidney transplants. However, the recent increase in graft survival in patients undergoing repeated transplants makes this option attractive. Renal retransplantation in the ipsilateral iliac fossa without transplantectomy is surgically challenging. These cases are still not common in the medical literature, and their report is important to increase the existing evidence supporting the effectiveness of repeated renal transplants.**

**Keywords:** Renal transplant, Retransplantation, Transplantectomy, Nephrectomy, Graft failure

## INTRODUCTION

Kidney transplantation is widely known as the best treatment for patients with end-stage renal disease, due to better survival, lower costs and better quality of life compared to dialysis [1].

Over the last few decades, the improvement of kidney transplantation, including surgical and immunosuppressive techniques, has allowed delicate situations, previously considered absolute contraindications, to be considered, such as transplantation after failure of the first graft. When considering retransplantation, careful screening of risk factors is mandatory, whether they are related to anterior graft failure; the clinical characteristics of the recipient or even the immunological status of the donor.

The expected result for reimplantation obviously depends on numerous factors namely: surgical difficulties, adhesions and vascular bed; risk of recurrence of current disease, recipient comorbidities and waiting time on dialysis until transplantation. In general, most transplant centers do not set a clear limit on the maximum number of retransplants. However, there are limited data on the results of retransplantation after graft failure.

## CASE REPORT

A 54-year-old man with a history of chronic kidney disease due to hypertension who had undergone two previous kidney transplants. The first was in 2014, which progressed to loss of kidney function due to chronic graft dysfunction and the second, in 2018, which also progressed to graft loss due to polyoma virus nephropathy in 2020. In January 2022, he interns again to undergo a third kidney transplant.

In the outpatient evaluation prior to the procedure, the hypothesis of intraperitoneal implantation in a common iliac vessel was raised due to previous implants in external iliac vessels on the left and internal vessels on the right. Angiotomography scan showed few sparse calcifications in aorta and iliac vessels, with no signs of evident stenosis.

Immediately before the surgical procedure, induction with thymoglobulin, cyclosporine and azathioprine was performed in the recipient and a graft was prepared for implantation on an auxiliary table. The Gibson incision was performed under previous incision to the right, iliac vessels and previously transplanted kidney with significant atrophy of its parenchyma were identified. On inspection of external iliac vessels, adequate space for vascular anastomosis with the graft was visualized, with few calcifications on palpation and adequate store to allocate the donated kidney. It was then chosen not to invade the intraperitoneal plane as previously suggested. The implantation of the vessels of the lateral end graft in external iliac vessels was

performed without intercurrents. Finally, a modified Lich-Gregoir ureter was implanted with the help of a ureteral catheter, during the closure of a non-located drain. The entire surgical procedure lasted for 255 minutes and bleeding was estimated at 500, with cold ischemia time of 14 hours and 59 minutes.

In the immediate postoperative period, patient with Doppler ultrasound of the transplanted kidney showing adequate arterial and venous flow. However, he evolves to delayed graft function, shown with slow decrease of nitrogenous slag and maintaining the same volume of residual diuresis pre-procedure, requiring hemodialysis. On investigation of DGF, DTPA showed no obstruction to urinary flow. However, with scintigraphic signs of acute tubular necrosis and new Doppler ultrasound maintaining adequate arterial and venous flow. Due to the technical difficulty of biopsying the transplanted kidney, corticosteroid pulse therapy was chosen with good resolution of the FGD, evolving to increased diuresis and improvement of nitrogenous sludge, with no further need for dialysis.

Patient is discharged after 43 days of hospitalization with good functioning of the graft. At the moment, patient maintaining adequate cyclosporine and prednisone for immunosuppression, with no further worsening in renal function.

## DISCUSSION

Currently, second kidney transplant is widely accepted as an excellent option for patients who have previously lost a kidney graft, with comparable graft survival to first transplants. However, there is a debate around the potential benefit of undergoing subsequent transplants or maintaining the patient in dialysis.

Subsequent transplants have emerged as a tempting option due to improved immunosuppressive armamentarium that may have a more profound benefit on sensitized individuals as well as improved HLA testing procedures that are better able to detect. In addition to the aforementioned, avoid transplantation across relevant preexisting antibodies. Reasons for loss of the first kidney graft, like various types of glomerulonephritis (e.g., FSGS, IgA nephropathy), systemic diseases, and diabetes mellitus, may also threaten following grafts. The most important factor probably is rejection. Both acute and chronic allograft rejection may result in immunization and increased chances for rejection of the following graft. Panel reactive antibody best describes the degree of immunization and in multi variable analysis high levels are associated with graft failure censored for death.

No theoretical limit to the number of kidney transplants that an individual patient can receive has been established. For older patients, especially those with a long history of smoking or diabetes, progression of peripheral vascular disease may be a limiting anatomic factor. Evaluation with radiographic or angiographic studies should be performed to help ensure that a suitable vascular anastomotic site is available. Furthermore, as well as to ensure that vascular stenosis proximal to the planned anastomotic site will not compromise blood flow to the allograft. Several retransplantation techniques have been described including the transperitoneal, retroperitoneal, and ortho-topic approach[2-5]. This raises the question which technique has to be elected as preferred.

A study by Ooms et al compared the surgical outcome of renal retransplantation in the ipsilateral iliac fossa compared to first renal transplants which ipsilateral retransplantation

was related to greater blood loss and longer operative time in the group. However, in the present study, all patients underwent nephrectomy (before or at the same time of transplantation) [6]. Mazzucchi et al evaluated patients undergoing the third transplantation, as in the present and elucidated case. The mean operative time was 327 min for retransplantation versus 295 min in the present case. One-year graft survival was 57% for retransplants versus 86% for first transplants [7]. Several studies report complication rates between 25% – 41% among hydronephrosis, hematomas, lymphoceles and intestinal perforations [8-11].

Occupied iliac fossae remain a real surgical challenge. In case of third or fourth kidney transplants, requesting higher operative time, simultaneous and challenging graft nephrectomy; present more bleeding; and develop higher vascular complications and also higher rates of reoperation and graft nephrectomy during postoperative period. However, the recent increase in graft survival in patients undergoing repeated transplants (61% after 5 years) makes this an attractive option [6].

### CONCLUSION

Renal retransplantation into the ipsilateral iliac fossa is surgically challenging and is associated with more vascular complications and graft loss in the first year after transplantation. In the case presented, the significant atrophy of the first graft and the viable vascular bed, coupled with the expertise of the transplant team at our tertiary center, allowed the transplant to be performed without the need for nephrectomy. This enabled a minimal bleeding rate, similar to the first transplant, despite the prolonged surgical time, and no postoperative complications. Therefore, the third kidney transplant in the iliac fossa still seems to be a reasonable option, but the case shows the importance of a rigorous preoperative evaluation and meticulous surgical planning.

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