

*Case report***Challenges of Deceased Kidney Transplantation in a Patient with Iliac Vein Thrombosis: Case Report**

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**Abstract**

Kidney transplantation is the preferred method of treatment for patients with end-stage kidney disease. A standard surgical technique uses the external iliac vessel for vascular anastomosis. However, sometimes due to the multiple vascular access patients may develop thrombosis and/or stenosis of the iliac vein leading to a challenge in identifying an appropriate vessel for anastomosis and regular graft function. In these circumstances, a multidisciplinary team approach is necessary for optimizing the engraftment survival and decreased morbidity and mortality. Hereby, we present a deceased donor kidney transplantation in a patient with iliac vein thrombosis and discuss facts from the literature.

**Keywords:** kidney transplantation, iliac vein thrombosis, vein anastomosis

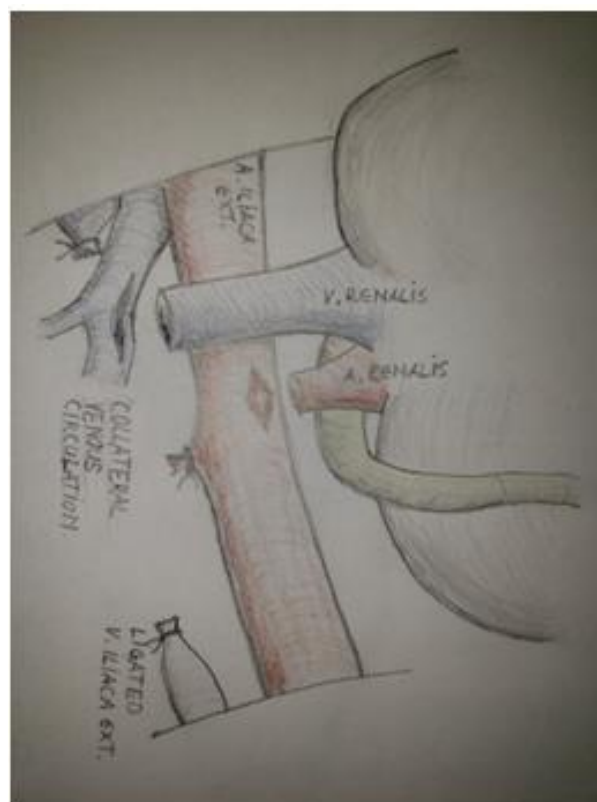
**Introduction**

Since 1977 until today, in our country kidney transplant has been the treatment of choice for patients with end-stage kidney disease (ESKD) [1,2]. A standard surgical procedure uses the recipient's external iliac vessels for vascular anastomosis [3]. In contrast to the living donor kidney transplantation, in deceased donor transplantation we are facing limited time for the recipient's preoperative preparation. Under these circumstances, thrombosis and/or stenosis of the iliac vein (due to numerous vascular accesses for dialysis), can be found intraoperatively, presenting a surgical challenge. In these cases, different and suitable venous drainage for the renal outflow has to be identified and anastomosed. A multidisciplinary team approach is required for the enhancement of graft function/survival and prevention of complications. We present venous anastomosis in

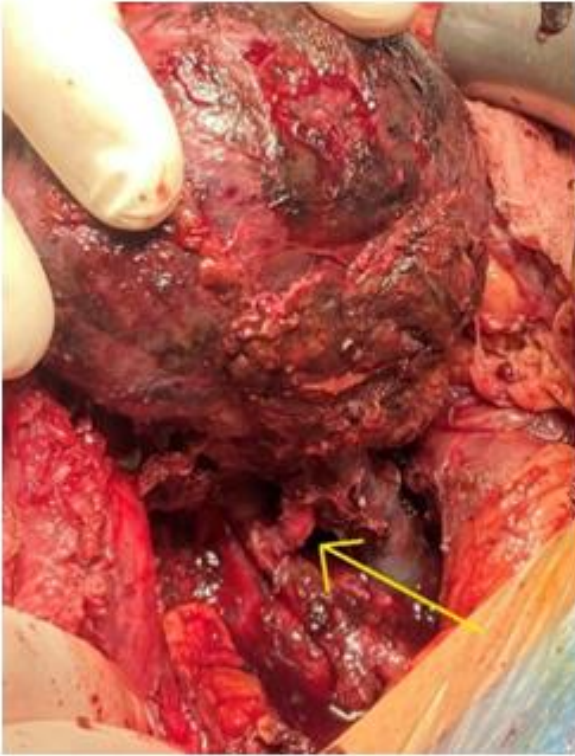
kidney transplant from a deceased donor in the collateral vessel of external iliac vein while iliac vein thrombosis was detected intraoperatively.

**Case report**

We present a 40-year-old ESKD male patient on dialysis for 4 years. The patient had a positive history for various difficulties with dialysis vascular accesses. Three years ago, an attempt for kidney transplantation from a



**Fig. 1.** Sketch of the vessel anastomosis



**Fig. 2.** Intact arterial vascular anastomosis



**Fig. 3.** Kidney necrosis

living donor failed because of severe orchiepididimitis and graft thrombosis. Thereafter, the patient was on therapy with pentoxifylline due to deep vein thrombosis of the right leg and relatively prolonged aPTT. He underwent his second kidney transplantation from a

deceased donor. The left kidney was transplanted in the left side due to a previous surgery on the right side. Induction in anesthesia went uneventful. The surgical dissection was made in the lower abdominal structures. Unfortunately, the surgical team noticed thrombosis of the iliac vessels as a consequence of multiple vascular accesses for hemodialysis, up to the inferior vena cava. A few hours later, one big collateral vein of the external iliac vein was identified, and prepared for venous graft anastomosis (Figure 1).

After 15 hours cold ischemia time and 74 minutes warm ischemia time, the arterial anastomosis and collateral vein anastomosis were finished and the clamp was removed. Unfortunately, not suitable venous drainage led to kidney rupture in the first 5 minutes, although the first urine drops were obtained at three minutes after removing the clamps. Bio glue and absorbable hemostatic surgical bag were used for surgical hemostasis in one hand, and in the other hand, a systemic anti-fibrinolytic drug (tranexamic acid) 1.5 gr in bolus and 1 gr continuously for 8 h, two units of fresh frozen plasma and 2.5 ml protamine for neutralizing the heparin were administered. Nitroglycerin was administered as well, for vasodilatation and improved venous drainage. All of the above mentioned undertaken safety measures have led to satisfactory hemostasis and graft flow. With satisfactory pulsatile Doppler signal on arterial flow (due to surgical bag obstacles) with adequate urine drops, the surgery was accomplished after 630 minutes. The patient was extubated at the end of the surgery and transferred to the transplant unit. He was hemodynamically stable, although with oliguria since the very first P.O. day. At the third postoperative day, CT-angiography showed thrombosis of the graft. The patient was then transferred to the operating room. Arterial anastomosis was intact, but due to the compromised venous drainage the graft was lost and nephrectomy was performed.

### Discussion

Studies show that mortality rate among recipients of kidney transplant is decreased compared to patients on the waiting lists [4]. Many studies are focused on the risk factors for graft loss and patient death in the early post-transplant period [4]. Also, it's known that HLA antibodies are an independent risk factor for graft lost or mortality during the first year after kidney transplant [5,6]. Our patient had HLA sensibilization due to the previous transplant from a living donor. According to the literature, other risk factor associated with graft lost is the cardiovascular condition of the deceased donor [6,7]. Studies showed that arrhythmia and left ventricular ejection fraction lower than 56% were independent risk factors for early graft failure or mortality [7-9]. Until today, there is no known recommendation for cardiovascular screening in kidney transplant recipients,

since there is a lack of evidence from randomized clinical trials [8,9]. We presented the case of a 40-year-old male patient without any known cardiac comorbidities. Before the surgery, the patient had intraoperative and postoperative normal findings on ECG and good left heart contractility.

In the literature there are 1 to 18% reported complications of all kidney transplants related to the surgical technique of vascular anastomosis [10]. The complications are often reported in the right-side kidney transplant, although in our presented case we had a left side kidney transplanted on the left side. Another complication emerges from the short vessels that lead to prolonged warm ischemia time during vessel anastomoses. Cases of recipients with vein thrombosis have been reported in the literature [10,11]. Our patient also had thrombosis of iliac vessels all the way to vena cava inferior due to multiple dialysis catheters in the left femoral vein. Efforts to anastomose renal vein with inadequate vein will probably result in irregular anastomosis that will be angulated, under pressure or with inadequate flow. Without any other possible solution, we decided to anastomose the renal vein with one collateral vein branch of the recipient's external iliac vein. At the same time, we were aware of the possible technical problems like thrombosis or hemorrhage that may lead to a graft failure. In the literature saphenous autograft, gonadal vein, bovine heterograft or vascular prosthesis have been reported for vessel anastomosis with good results [10,12,13]. Cerqueira *et al.* reported a successful graft survival in five cases with thrombosis and/or stenosis of iliac vein anastomosed with gonadal vein. In three cases, they reported a delayed graft function; two cases had infection and one patient was re-operated [13]. The presented case was medical emergency due to impending inability of establishing vascular access for dialysis. Due to thrombosis, iliac vessels or inferior vena cava was not a suitable option and the best available alternative was chosen. Unfortunately, we did not achieve satisfactory drainage with the obtained vein graft anastomosis and the third postoperative day the graft was lost. We assume that constrained vascular anastomosis with poor vascular condition related to possibly disordered coagulopathy should be the reason for early graft lost in the presented case.

## Conclusion

Venous anastomosis with collateral iliac vein, for kidney transplantation in patients with iliac vein thrombosis

gives usually good results. This method may be used as a satisfactory alternative for venous drainage in complex cases like ours. In cases with multiple catheter insertions or waitlisted candidates for re-transplantation, recent angiography images are required, in order to be considered as possible cadaveric kidney recipients.

*Conflict of interest statement.* None declared.

## References

- Gavrilovska-Brzanov A, Grabner C, Mojsova-Mijovska M, *et al.* Comparison of anesthesia management for kidney transplant-through case report. *Physioacta* 2019; 13(1): 119-123.
- Spasovski G, Dohcev S, Stankov O, *et al.* The improvement in kidney transplant program in R. Macedonia - what are the clues? *Prilozi* 2013; 34: 9-13.
- Benoit G. Surgical technics of kidney transplantation. *Prog Urol* 1996; 6(4): 594-604.
- Wolfe RA, Ashby VB, Milford EL, *et al.* Comparison of mortality in all patients on dialysis, patients on dialysis awaiting transplantation, and recipients of a first cadaveric transplant. *N Engl J Med* 1999; 341: 1725-1730.
- Faravardeh A, Eickhoff M, Jackson S, *et al.* Predictors of graft failure and death in elderly kidney transplant recipients. *Transplantation* 2013; 96: 1089-1096.
- Cho H, Yu H, Shin E, *et al.* Risk factors for graft failure and death following geriatric renal transplantation. *PLoS One* 2016; 11: e0153410.
- Ma MKM, Lim WH, Craig JC, *et al.* Mortality among younger and older recipients of kidney transplants from expanded criteria donors compared with standard criteria donors. *Clin J Am Soc Nephrol* 2016; 11: 128-136.
- Lemoine M, Beauport DT, Lobbedez T, *et al.* Risk Factors for Early Graft Failure and Death After Kidney Transplantation in Recipients Older Than 70 Years. *Kidney Int Rep* 2019; 4: 656-666.
- Meier-Kriesche HU, Ojo AO, Cibrik DM, *et al.* Relationship of recipient age and development of chronic allograft failure. *Transplantation* 2000; 70: 306-310.
- Janschek EC, Rothe AU, Holzenbein TJ, *et al.* Anatomic basis of right renal vein extension for cadaveric kidney transplantation. *Urology* 2004; 63: 660-664.
- Baptista-Silva JC, Verissimo MJ, Castro MJ, *et al.* Anatomical study of the renal veins observed during 342 living-donor nephrectomies. *Sao Paulo Med J* 1997; 115: 1456-1459.
- Nghiem DD. Spiral gonadal vein graft extension of right renal vein in living renal transplantation. *J Urol* 1989; 142: 1525.
- Cerqueira J, Oliveira C, Silva B, *et al.* Kidney transplantation using gonadal vein for venous anastomosis in patients with iliac vein thrombosis or stenosis: A series of cases. *Transplant Proc* 2017; 49(6): 1280-1284.
- Spaggiari M, Bella CD, Cocco PD, *et al.* Emergency kidney transplantation in recipients with ilio caval thrombosis using splenic vessel anastomosis after splenectomy: A case series. *Transplant Proc* 2018; 50(1): 99-103.