Section: Urology

Case Series

PERIGRAFT COLLECTIONS POST RENAL TRANSPLANTATION: OUR INSTITUTIONAL EXPERIENCE

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ABSTRACT

Background: Perigraft fluid collections (PFCs), including lymphoceles, urinomas, haematomas, and abscesses, are frequent complications following renal transplantation. These collections can range from asymptomatic findings to clinically significant graft dysfunction or loss. Despite their relevance, institution-specific data are scarce.

Case Presentation: We report a case series of nine renal transplant recipients who developed perigraft collections at a tertiary care centre. The patients included both living and deceased donor recipients. Presentations varied from incidental findings to symptomatic cases with urinary leakage, wound infection, and sepsis. Imaging identified lymphoceles (n=3), urinomas (n=3), seromas (n=2), and abscesses (n=1).

Management and Outcomes: Interventions included conservative management (n=1), aspiration (n=2), percutaneous drainage(n=2) percutaneous drainage and percutaneous nephrostomy (n=1), nephrectomy (n=2), and ureteroureterostomy with PCN (n=1). While most patients maintained stable graft function following treatment, two experienced graft loss due to fungal infection and antibody-mediated rejection, respectively.

Conclusion: Perigraft collections have diverse aetiologies and impacts. Early identification through imaging and timely intervention are critical for minimising complications and preserving graft viability. This case series highlights the clinical variability and management strategies for PFCs in the post-transplant setting.

Key Words: Perigraft fluid collections, Renal transplantation, Lymphoceles, Graft dysfunction.

INTRODUCTION

Renal transplantation remains the gold standard for end-stage renal disease, offering better survival and quality of life than dialysis does. Despite advances in surgical techniques and immunosuppression, post-transplant complications pose significant challenges to patient and graft outcomes following kidney transplantation.[1,2] Among these, perigraft collections, including lymphoceles, urinomas, haematomas, and abscesses, frequently occur in the early and late postoperative periods. These fluid accumulations around the renal allograft can arise from surgical disruption of lymphatics, urinary leaks, vascular injury, or infection, with an incidence reported from 10% to 50% depending on the diagnostic criteria and protocols.[3]

The clinical significance of perigraft collection varies. While many remain asymptomatic and are found incidentally on imaging, others can exert a mass effect, leading to graft dysfunction, vascular compromise, infection, or allograft loss.[4,5] Differentiating between benign and clinically significant collections is crucial, as management ranges from observation to percutaneous drainage and surgery. Additionally, perigraft collections may mimic or mask other post-transplant complications,

requiring high suspicion and systematic diagnosis.[6] Despite their recognised importance, there are limited institution-specific data on the incidence, risk factors, presentation, and outcomes of perigraft collections. Variations in surgical techniques, perioperative care, and patient demographics influence these outcomes. Understanding these factors within the experience of a single institution can provide insights into optimising post-transplant care.

This case series investigated perigraft collections following renal transplantation, focusing on their risk factors and the accuracy of the diagnostic imaging. We examined their impact on graft function and patient outcomes while evaluating the effectiveness of different management strategies in resolving these collections.

CASE PRESENTATION

Case 1

A 62-year-old obese woman underwent deceased donor renal transplantation (DDRT) and experienced delayed graft function requiring haemodialysis. She was discharged on postoperative day (POD) 23 with a stable serum creatinine (S.Cr.) level of 1.1 mg/dL. On POD 24, she developed a serous discharge from the lower end of the wound, Fluid analysis and imaging confirmed urinary leak and ureterocutaneous fistula. Percutaneous nephrostomy (PCN) was performed.

The urinary leak persisted for over 2.5 months despite PCN, with S.Cr levels ranging from 0.8 to 1.4 mg/dL. The amount of urine leakage from the wound increased; therefore, surgical re-exploration was performed, and the lower ureter of the graft kidney was found to be necrotic. Hence, native ureter to graft upper ureteric anastomosis with a double-J stent (DJS) and PCN exchange was performed. At 5 months post-transplant, the PCN got dislodged, with a mild leak from the wound, requiring CT-guided PCN reinsertion. At 7 months, another PCN dislodgement occurred, but patient had normal voiding with no further urine leak from the wound. The DJ stent was removed one month after the PCN dislodgement. The patient remained stable, with no further leaks and S. Cr level of 1.4 mg/dL.

Case 2

A 36-year-old obese woman underwent DDRT for dialysis-dependent end-stage renal disease and developed delayed graft function, requiring seven sessions of haemodialysis. She was discharged on POD 15 with an S.Cr level of 1.4 mg/dL and was well. On POD 24, the patient presented with serous discharge and right iliac fossa (RIF) swelling. Ultrasonography (USG) revealed a perigraft fluid collection measuring 18 × 7.7 × 6.6 cm in the RIF, extending to the pelvis, with preserved graft vascularity. Aspiration and PCD were performed on POD 25 . Analysis confirmed lymphocele. The PCD drain persisted for more than 10 days and never less than 500 ml. Hence, Betadine instillation was performed twice at one-month interval. Serial imaging was performed to monitor the resolution of collection . Five months post-transplant, the PCD was removed, and no further discharge or fluid reaccumulation was observed. Currently, the graft function remains stable, with S. Creatinine of 1.2 mg/dL.

Case 3

A 50-year-old man underwent DDRT and experienced delayed graft function, requiring ten haemodialysis sessions. During the fourth postoperative week the patient developed fungal pneumonia. Immunosuppressive therapy was withheld because of the fungal infection, and the patient was maintained on prednisolone. On POD 36, the patient presented with RIF swelling pain and urine leakage from the wound which was confirmed by analysis and imaging.

Imaging revealed urinoma and moderate HUN. A Foley catheter was inserted on POD 36, and PCD and PCN were placed on POD 37. The patient was discharged on POD 52 with a PCD, PCN, and Foley catheter. Two months post-transplant, the PCD and PCN were removed . Monitoring with ultrasound showed no collections. Five months post-transplant, the patient developed chronic graft dysfunction with S.Creatinine level of 5.2 mg/dL and was on maintenance haemodialysis.

Case 4

A 31-year-old man underwent living-related renal transplantation (LRRT) with an ABO-compatible graft from his mother. The patient had immediate graft function and was discharged on POD 9 with an S.Cr level of 0.8 mg/dL. The DJS was removed on POD 21 without complications. At 1.5 months post-transplant, the patient presented with reduced urine output (S.Cr: 2.1 mg/dL). USG revealed acute ureteric obstruction with perinephric urinoma and moderate hydronephrosis. Management included the insertion of a PCN, PCD, Foley catheter, and DJS.

The PCN tube was repeatedly blocked by whitish debris, which was sent for culture and sensitivity testing. USG revealed echogenic material in the renal pelvis extending into the collecting system. During treatment, the patient developed reduced urine output, fever, and right lower limb oedema. Surgical re-exploration revealed an inflamed, enlarged graft kidney with fluffy material in the pelvicalyceal system. Graft nephrectomy was performed, and histopathological examination revealed invasive Aspergillosis.

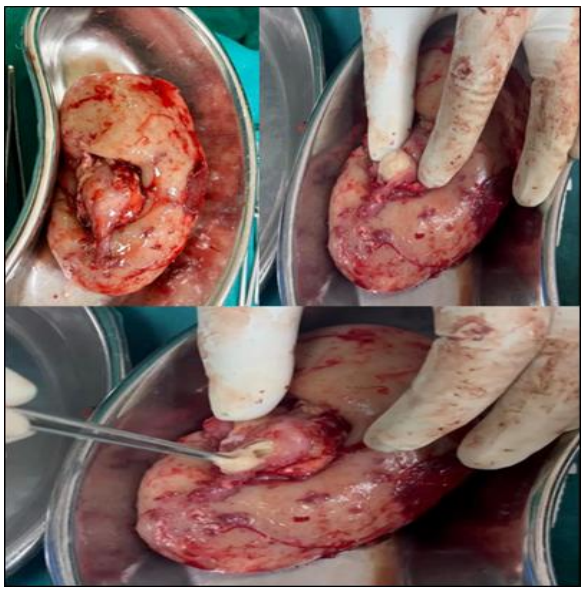

Figure 1: Fungal ball in kidney

Case 5

A 40-year-old woman with chronic kidney disease secondary to IgA nephropathy underwent ABO-compatible living donor renal transplantation from her husband. The patient exhibited delayed graft function and reduced urine output. One saline haemodialysis session was required for metabolic acidosis. Urine output improved from POD 2 with supportive therapy. Doppler ultrasound revealed a normal graft with a 4 × 3 cm posterior collection. She was discharged on POD 15 with a creatinine level of 1.0 mg/dL and DJ stent removal on POD 22.

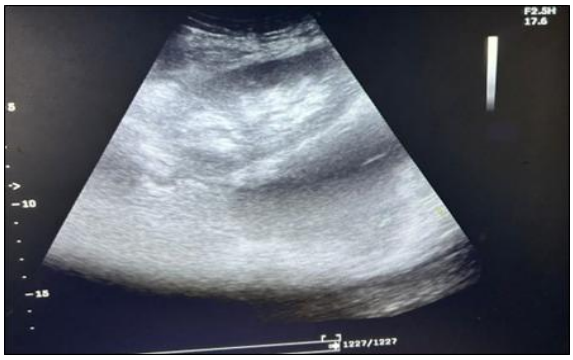

Figure 2: Doppler ultrasound-One month post surgery

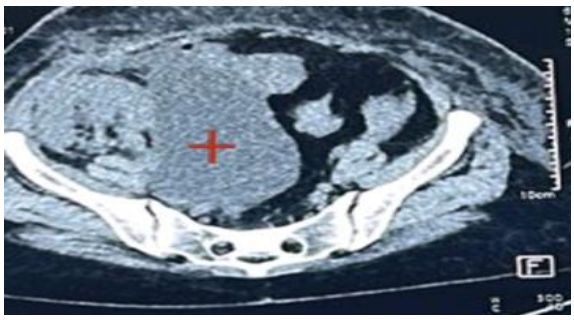

Figure 3
CT KUBU-ONE MONTH POST TRANSPLANT

One month post-transplant, the patient was readmitted with leg oedema, reduced urine output, and abdominal wall necrotising fasciitis. Ultrasound revealed a 12 × 7 cm perinephric collection and fluid analysis confirmed the diagnosis of lymphocele. The drain output decreased from 800 mL to zero on day 15. Imaging revealed a residual 200 mL perinephric collection posterior to the kidney, and another puncture was planned but could not be performed because of the proximity to the bowel. The PCD was removed because of neutropenia and the risk of infection. On follow-up after 2 weeks, the collection was less than 50 ml, and the patient had a stable graft function. With wound debridement and regular dressing, the necrotising fasciitis healed well.

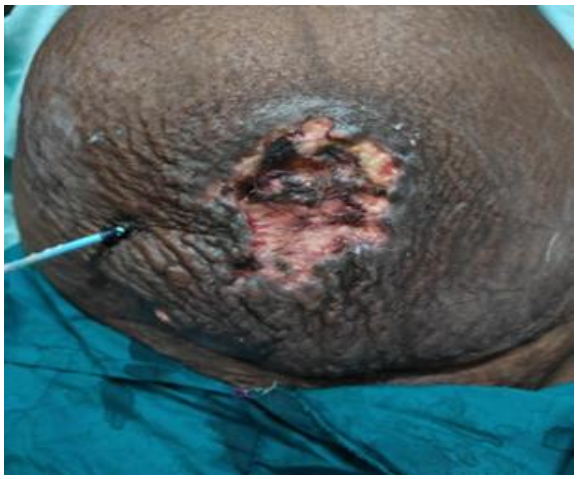

Figure 4: Necrotising fasciitis

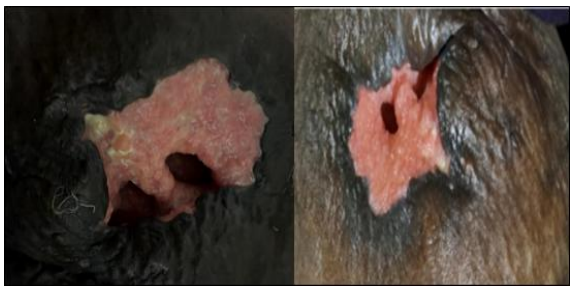

Figure 5: After debridement

Case 6

A 34-year-old man with end-stage renal disease underwent ABO-incompatible (B to O incompatible) renal transplantation with his wife as the donor. Pre-transplant desensitisation included rituximab and initiation of tacrolimus and mycophenolate mofetil on day -7. The baseline anti-B IgG titre was 1:128 and was reduced to 1:16 after two plasmapheresis sessions. Transplantation was performed using basiliximab induction and methylprednisolone therapy.

Table 1: Postoperative Day-wise Monitoring of Urine Output, Drain Output, Serum Creatinine, and Graft Doppler Findings

POD	Urine output / DT	Sr.creatinine	Graft doppler
POD-3	More than 5L DT - 70 ml	0.9	Normal RI, well-perfused graft
POD-4	Less than 200 ml (thin hematuria) DT - 350 ml (analysis - seroma)	1.1	Normal. PLEX started. Perinephric collection 5 x 3 cm
POD-5	Less than 100 ml DT - 450 ml	2.5	All poles arewell- perfused. Flow noted in MRA. Diastolic flow is not visualized in MRA.
POD-7	Less than 100 ml DT - 480 ml	4.0. Had 3 sessions of PLEX.	MRA Monophasic flow, no diastolic flow, hypo-perfused graft

On POD 8, Doppler USG revealed absent flow in the main renal artery and its segmental branches, whereas the internal iliac artery appeared normal. CT renal angiography (CTRA) demonstrated transplant renal artery thrombosis, with opacification of the right internal iliac artery up to 1 cm from its origin and non-opacification of the entire renal artery from the anastomotic site onwards, suggesting complete thrombosis. Renal biopsy revealed extensive coagulative necrosis involving both the cortex and medulla, with no viable tissue. Immunohistochemistry revealed C4d positivity in the peritubular capillaries of the kidney. Therefore, a graft nephrectomy was performed.

Intraoperatively, the graft was dusky, swollen, and non-salvageable despite the normal recipient's internal iliac artery and patent anastomoses. The graft renal artery was pale and thickened. The cross-section showed a darkening at the cortico-medullary junction, suggesting arcuate artery thrombosis. Histopathological examination confirmed cortical and medullary necrosis, with C4d-positive peritubular capillaries indicating severe antibody-mediated rejection (ABMR) and vasculitis, indicating hyperacute ABMR, which caused primary graft non-function.

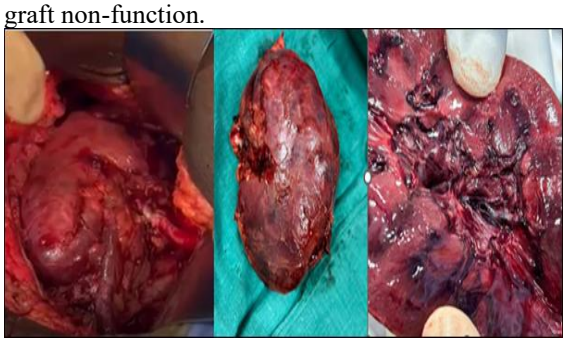

Figure 6: Coagulative necrosis of cortex and medulla

Case 7

A 56-year-old man underwent ABO-incompatible living-related renal transplantation (LRRT) with his spouse as the donor. USG on the 14th POD showed a normal Doppler with a well-defined hypodense collection with internal septations measuring 5.8 × 3.2 cm in the posterior aspect of the lower pole of the kidney and another ill-defined collection measuring 6.8 × 5 cm in the posterior aspect of the transplanted kidney in the lower part adjacent to the bladder. Impression: Transplant kidney in RIF with normal Doppler and perinephric collection, Probably Lymphocele.

The patient did not want any intervention and was planned for conservative management with regular follow-up. Six weeks after the transplant, stable graft function was observed with a collection of approximately 190 cc anteroinferior to the transplanted kidney and another collection of 117cc posterior inferior to the transplanted kidney. The patient opted for conservative treatment. Regular monitoring was done, collection gradually reduced in size and at the end of 4th month, the collection was less than 10 ml with stable graft function.

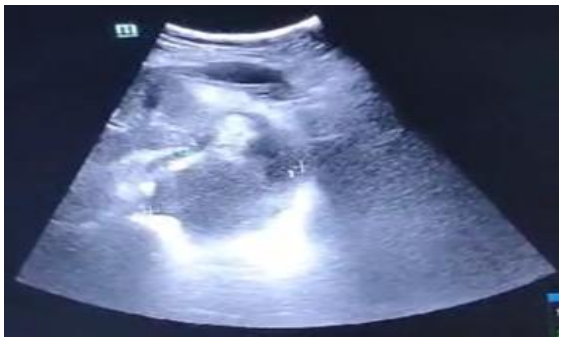

Figure 7: Posterior collection

Figure 8: Anterior collection

Case 8

A 57-year-old woman underwent an ABO-compatible DDRT. The transplant was uneventful, and immediate graft function was established. The Foley catheter was removed on POD 20, and the patient was discharged with a drain tube (DT) in situ due to persistent DT fluid of approximately 70–100 ml (seroma). Both the DT and DJS were removed on POD 28. Two months after surgery, the patient was

admitted with pyelonephritis, renal microabscess, and a 3 × 2 cm perinephric abscess. Aspiration and culture showed Pseudomonas. Antibiotics were initiated, and the infection resolved. Graft functioning well. The patient was regularly followed up with no additional complaints.

Case 9

A 51-year morbidly obese woman underwent ABO-compatible DDRT. The transplant was uneventful with delayed graft function, and the patient was discharged with an S. Cr of 1.3. On POD 2, the patient developed CRBSI, gram-negative sepsis, and septic shock, requiring dual inotropic support. The patient was managed with intravenous antibiotics, and the Right IJV catheter was removed. The patient had a wound gaping which required secondary suturing. The patient was readmitted two and a half months later with vomiting and gastritis and was treated accordingly. On evaluation, the patient was found to have a 9 × 4 cm perigraft collection (seroma), which was aspirated, and fluid analysis showed cholesterol 69 and TGL 46. On follow-up, the patient had an insignificant collection in the subcutaneous plane.

Case Summary

Table 2: Total transplants from August 2023 to Jan 2025

Type of Transplant	Total cases	Perigraft collection	Percentage
ABO c LRRT	28	2	7 %
ABO ic LRRT	13	2	15 %
DDRT	15	5	33 %
Total	56	9	16 %

Table 3: Type of collection

Type of collection	Number	Percentage
Seroma	2	22%
Lymphocele	3	33%
Urinoma	3	33%
Abscess	1	11%

Table 4: Management done

Management done	Number	Percentage
Conservative	1	11 %
Aspiration	2	22%
PCD	2	22%
Nephrectomy	2	22%
PCN + Ureteroureterostomy PCN and PCD	1 1	11 % 11%

DISCUSSION

PFCs are complications that can occur after kidney transplantation, including lymphoceles, urinomas, haematomas, and abscesses, with a reported incidence ranging from 10% to 50%, depending on the diagnostic protocols and patient populations. This case series from our institution shows the range of PFCs, their clinical manifestations, management approaches and outcomes.

Our series documented PFCs in various clinical scenarios, involving both living and deceased donor kidney transplants, with presentations ranging from asymptomatic collections to those causing significant graft dysfunctions. The reported incidence of PFCs in the studies varies widely, from 10% to 50%, depending on the diagnostic criteria and surveillance protocols.[3,4,7]

The risk factors identified in our series include delayed graft function, immunosuppression, and infection, aligning with previous studies that highlighted cadaveric kidneys, ureteral ischaemia, urinary leaks, haematoma, lymphocele formation, recipient characteristics,[4,7] Three of our patients with perigraft collection were morbidly obese. Notably, two patients in our series developed fungal infections that complicated their post-transplant course, a rare but severe scenario documented in prior studies, which is associated with increased morbidity, prolonged hospitalisation, and a higher risk of graft loss.[7,8]

Our cases reported that PFCs can present at any time post-transplant, from the immediate postoperative period to several months later.[7,8] Some collections are detected incidentally on routine imaging, whereas others present with symptoms such as swelling, pain, urinary leakage, or signs of graft dysfunction. Imaging modalities, particularly USG and CT, were instrumental in diagnosing and characterising these collections, and the standard diagnostic approaches.[9]

In our series, the interventions included PCD, PCN, surgical re-exploration, and conservative management. This reflects the approach described by Guerrero et al., who reported that only 22.6% of PFCs required active treatment, with percutaneous drainage as the first-line therapy and a high success rate (≥ 80%).[4] Surgical intervention was reserved for cases in which minimally invasive therapy failed, consistent with studies that recommend open or surgical management only after less invasive options have failed.[10,11] Several cases in our series, such as

those with persistent lymphoceles or urinomas, required repeated or prolonged drainage procedures, highlighting the challenges in managing complex or recurrent collections.[11] In contrast, asymptomatic collections were managed conservatively, with spontaneous resolution observed on follow-up imaging, a strategy supported by both our outcomes in studies.[11,12]

The impact of PFCs on graft function and patient outcomes varies. In our series, most patients achieved stable graft function following the resolution of the collection; however, two experienced graft loss due to severe infection and rejection. Guerrero et al. similarly noted that while most PFCs are benign, a subset can lead to significant morbidity if not recognised and managed promptly.[4]

CONCLUSION

Our case series highlights the complex nature of PFCs following renal transplantation, which can occur at various post-transplant time points, presenting either asymptomatically or with clinical manifestations. The risk factors include delayed graft function, immunosuppression, obesity, and infection. Management ranges from conservative observation to surgical intervention depending on the individual case. While most patients achieved stable graft function after PFC resolution, complications such as fungal infections and graft loss occurred in a few.

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REFERENCES

1. Al-Amri TM, Alharthi YH, Alkhamis AS, Muhaif AIA, Almutairi MA, Mousa NMA, et al. Common complications post-kidney transplantation: a literature review. Int J Community Med Public Health 2021; 8:3688. https://doi.org/10.18203/2394-6040.ijcmph20212342.
2. Haberal M, Boyvat F, Akdur A, Kirnap M, Özçelik Ü, Karakayali FY. Surgical complications after kidney transplant. Transplan Surg, Cham: Springer International Publishing; 2021, p. 181–94.
3. Halawa A, Alshamsi I, Alshamsi H, Al Falahi S, Sharma A. Perinephric transplant fluid collection approach and management. Saudi J Kidney Dis Transpl 2019; 30:564. https://doi.org/10.4103/1319-2442.261328.
4. Guerrero-Ramos F, Cavero-Escribano T, Rodríguez-Antolín A, Andrés-Belmonte A, Passas-Martínez J, Tejido-Sánchez Á. Perigraft fluid collections after kidney transplantation: Does the type of donor (uncontrolled donation after circulatory death vs. donation after brain death) have a role? Cent European J Urol 2017; 70:439–44. https://doi.org/10.5173/ceju.2017.1255.
5. Brown ED, Chen MY, Wolfman NT, Ott DJ, Watson NE Jr. Complications of renal transplantation: evaluation with US and radionuclide imaging. Radiographics 2000;20:607–22. https://doi.org/10.1148/radiographics.20.3.g00ma14607.
6. Caiado AHM, Blasbalg R, Marcelino ASZ, da Cunha Pinho M, Chammas MC, da Costa Leite C, et al. Complications of liver transplantation: multimodality imaging approach. Radiographics 2007;27:1401–17. https://doi.org/10.1148/rg.275065129.
7. Richard HM. Perirenal transplant fluid collections. Semin Intervent Radiol 2004;21:235–7. https://doi.org/10.1055/s-2004-861557.
8. Kobayashi K, Censullo ML, Rossman LL, Kyriakides PN, Kahan BD, Cohen AM. Interventional radiologic management of renal transplant dysfunction: indications, limitations, and technical considerations. Radiographics 2007;27:1109–30. https://doi.org/10.1148/rg.274065135.
9. Kuczyńska M, Piasek E, Światłowski Ł, Kuklik E, Sobstyl J, Drelich-Zbroja A, et al. Sonographic assessment of the prevalence and evolution of fluid collections as a complication of kidney transplantation. J Ultrason 2018;18:126–32. https://doi.org/10.15557/JoU.2018.0018.
10. Knox J, Watson E, Fidelman N, Taylor AG, Kolli K, Lehrman E, et al. Outcomes after peripancreatic fluid drainage in patients with simultaneous pancreas-kidney transplantation. J Vasc Interv Radiol 2019;30:918–21. https://doi.org/10.1016/j.jvir.2018.10.030.
11. Gipson MG. Percutaneous management of lymphoceles after renal transplantation. Semin Intervent Radiol 2013;30:215–8. https://doi.org/10.1055/s-0033-1342964.
12. Alshamsi I, Alshamsi H, Al Falahi S, Sharma A, Halawa A. Perinephric transplant fluid collection approach and management. Saudi J Kidney Dis Transpl 2019;30:564–70. https://doi.org/10.4103/1319-2442.261328.