Salvage of Spontaneous Renal Allograft Rupture: A Case Report

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ABSTRACT

Allograft rupture is a rare complication of renal transplant. The causes are acute rejection, acute tubular necrosis, or renal vein thrombosis. Salvage of the graft can be attempted but in most cases, graft nephrectomy is performed. Herein, we present a case of spontaneous renal allograft rupture salvaged by timely intervention. A 37-year male, a known case of end-stage renal disease (ESRD) on dialysis for six months, underwent a live, unrelated renal transplant. He was discharged on the 3rd postoperative day but presented on the 10th postoperative day with low haemoglobin and heavy soakage of dressing. A plain CT scan of the abdomen and pelvis showed a large perigraft haematoma. Exploration was performed. There were three lacerations in the kidney, 3 cm, 5 cm, and 1 cm, in the upper, interpolar region, and lower pole, respectively. The lacerations were sutured and packed. After 48 hours, re-exploration and pack removal were done. No active bleeding was observed, and the graft was salvaged.

Key Words: *Kidney graft, Graft rejection, Haematoma, Nephrectomy*.

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INTRODUCTION

Renal allograft rupture (RAR) is a serious but rare complication that occurs after renal vein thrombosis (RVT), acute rejection, or acute tubular necrosis (ATN).[1,2] Lymphatic obstruction and renal graft biopsy are also possible causes.[3,4] This is a life-threatening situation for the renal graft as well as for the patient. This condition usually presents as early as in the first 1-3 weeks after transplantation but in literature, cases have been reported to occur as late as 72 months.[5-7] The patients present with hypotension, tachycardia, increased drain output, graft swelling with a significant drop in haemoglobin, and pain and it requires immediate resuscitation and exploration. Graft nephrectomy is performed in many cases to save the patients' life; however, graft salvage has also been performed successfully by repair.[8-12] We hereby report a rare case of spontaneous renal graft rupture.

CASE REPORT

A 37-year male, post-live-unrelated renal transplant, presented on 13th March 2024 with complaints of pain at the graft site and a blood-soaked dressing. His haemoglobin was 7 g/dl, and serum creatinine was 11 mg/dl on the 10th postoperative day.

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The patient was diagnosed in July 2021 as case of end-stage renal disease (ESRD) secondary to Focal Segmental Glomerulosclerosis (FSGS). He has been on maintenance dialysis since October 2023. He has been hypertensive since 2015, for which he was taking the tablet Amlodipine 5 mg twice daily. The patient underwent a live, unrelated renal transplant on 3rd March 2024. No pre-transplant work-up, laboratory results, operative notes, or postoperative course were available.

On examination, the graft site was tender, and the dressing was soaked with blood. Colour Doppler ultrasound showed haematoma in the muscle anterior and superior to the anterior capsule of the transplanted kidney. On colour Doppler, the kidney showed good global perfusion. No focal area devoid of flow in the transplanted kidney was visualised. The renal artery and vein were patent. The resistive index (RI) was 0.84. A plain CT scan of the abdomen and pelvis showed a peri-graft collection of 10 x 3 x 15 cm approximating 225 ml (Figure 1, 2). He was prepared for exploration.

Upon exploration, a huge haematoma was found in the perirenal space, which was evacuated. The graft kidney was then identified and there were three lacerations in the transplanted kidney, 3 cm, 5 cm, and 1 cm—in the upper, interpolar region, and lower poles, respectively. There was active bleeding from the lacerations and the kidney was swollen and tense but there were apparently no signs of graft ischaemia or hyperacute rejection. Thus, we decided to repair instead of explantation. Surgicals were placed on lacerations and sutured with Vicryl 3-0 (Figure 3). The active bleeding from the lacerations stopped but there was still oozing from the allograft, so the allograft was packed to secure haemostasis and planned to re-explore after

48 hours. The renal artery was pulsatile and the renal vein was patent. Two drains were placed. It was decided peroperatively not to take a biopsy, which was planned preoperatively to find out the cause.

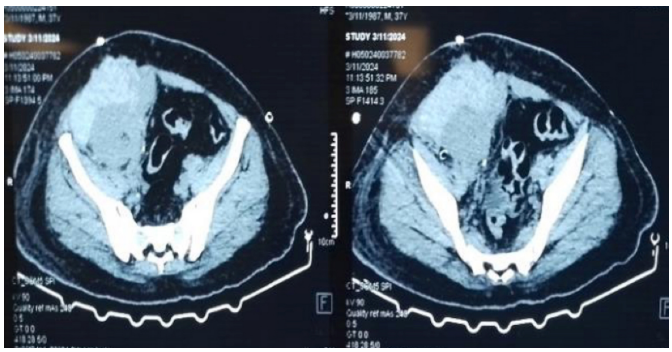

Figure 1: CT scan of abdomen and pelvis showing perigraft collection.

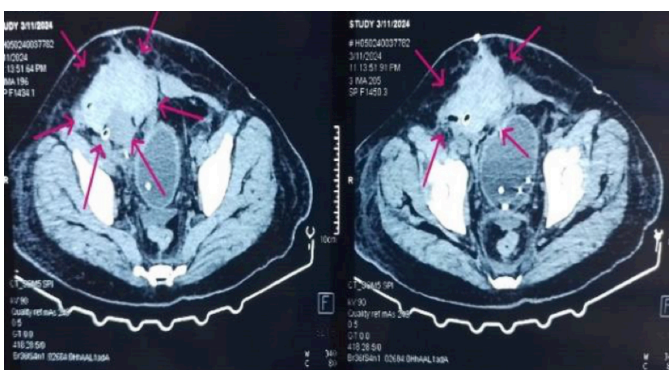

Figure 2: CT scan of abdomen and pelvis, arrows showing perigraft haematoma.

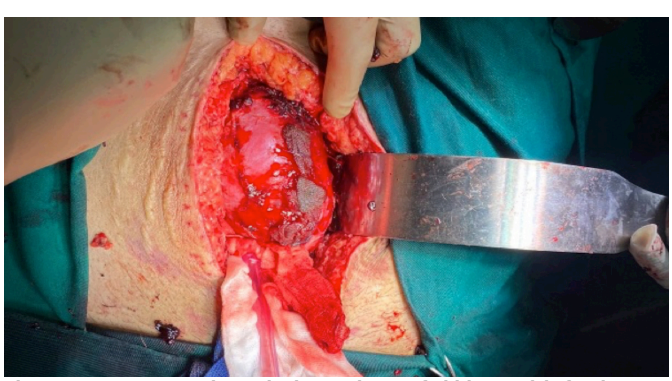

Figure 3: Sutures and surgicals on the graft kidney with fresh ooze coming from the allograft.

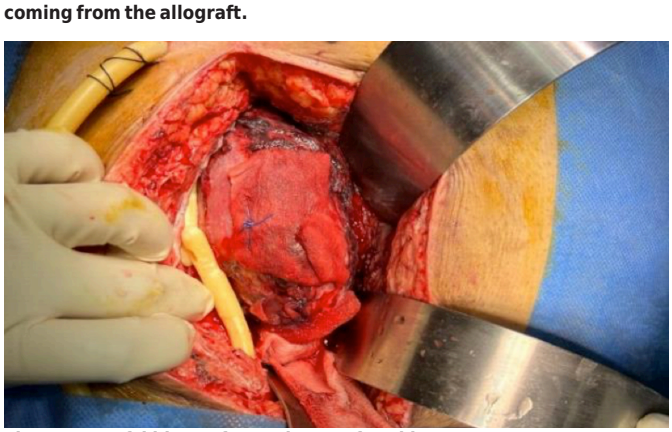

Figure 4: Graft kidney after 48 hours of packing.

Re-exploration was done after 48 hours. The packs were removed and there was no bleeding or oozing from the graft (Figure 4). The swelling and tension in the kidney were reduced. A biopsy was taken from the graft, which showed antibody-mediated rejection. One drain was removed. Only the skin and the subcutaneous tissue with fat were closed with mattress sutures. The patient was put on methylprednisolone.

The postoperative recovery was uneventful. The patient had 4 sessions of haemodialysis. On 6th postoperative day, the drain was removed and the patient was discharged. His urine output was 2.5-3 litres daily. On follow-up after a week, the patient's creatinine was 1.2 mg/dl. On ultrasound, there was no hydronephrosis or perigraft collection and the graft was normal. The wound was healthy.

DISCUSSION

RAR is defined as a tear, superficial or deep, in the renal capsule or parenchyma.[1,2] RAR is usually caused by ATN, RVT, or acute rejection.[1-3] Other possible causes such as lymphatic obstruction and renal graft biopsy have also been reported.[3,4] Acute rejection is the most common cause.[6] As mentioned in this case, a ruptured renal transplant presents as an acute event with decreased haemoglobin, tachycardia, and swelling in the graft area with pain. Management needs initial supportive treatment followed by surgical exploration with either graft nephrectomy or salvage of the graft. Salvage of the renal graft after spontaneous rupture is a challenging surgical task. A graft nephrectomy might still be needed after successful salvage.[4,8] In the present case, the decision to salvage the graft was taken, based on factors such as timely intervention, haemodynamic stability, and achievement of haemostasis. Susan *et al*. reported successful salvage in early allograft rupture in all four cases where acute rejection was the cause of rupture leading to the conclusion that graft salvage can be done if haemostasis is achieved and the haemodynamic condition of the patient allows it.[9]

However, the literature has shown poor outcomes after graft salvage. Patients often need nephrectomy, even when successful graft salvage was done.[4,8]

In haemodynamically unstable patients who do not respond to aggressive resuscitation, graft nephrectomy should be the only definitive treatment.[10,11]

In the present case, the patient responded to resuscitation, and haemostasis was successful. Although the kidney was tense and oedematous, the renal artery and vein were not thrombosed.

RAR is a potential complication after kidney transplantation even with the advancements in immunosuppressive medications. Since RAR is a life-threatening condition, prompt diagnosis and intervention are necessary. While explantation may be the treatment of choice in many cases, surgical techniques have fortunately progressed. This allows surgeons to attempt graft salvage in cases where bleeding is controllable and the patient's overall survival is not at risk.

PATIENT'S CONSENT:
Consent was obtained from the patient for participation in this study and for the publication of any related data.

COMPETING INTEREST:
The authors declared no conflict of interest.

AUTHORS' CONTRIBUTION:
UUK: Conception, design, data acquisition, and drafting.
MI: Analyses and article revision.
HU: Conception, design, article revision, and review.
RT, AM: Analysis and article revision.
All authors approved the final version of the manuscript to be published.

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