

1 Obstruction hernia post renal 2 transplant: a case report in a 3 Tertiary Care Center, Jeddah

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6 ABSTRACT

7 **Background:** Kidney transplantation is the preferred treatment for end-stage renal disease (ESRD) due to its superior outcomes
8 compared to dialysis. However, complications such as infection, wound dehiscence, incisional hernia (IH), and rarely, renal
9 paratransplant hernia (RPH) can occur post-transplant. This study reported a case of a patient with a post-renal transplant who
10 presented abdominal symptoms requiring urgent laparotomy for an obstructed hernia at the transplant site.

11 **Case Presentation:** A 57-year-old male with non-alcoholic fatty liver disease, ESRD secondary to IgA nephropathy, myelofibrosis,
12 and renal stones underwent a renal transplant from his son. He presented to the emergency department 6 days after he was
13 discharged with severe abdominal pain, vomiting, and a visible bulge at the transplant incision. Ultrasound confirmed an IH with
14 small bowel obstruction. Exploratory laparotomy successfully managed the hernia, and postoperative care included antibiotics
15 and supportive measures. The patient recovered uneventfully and was discharged in good condition.

16 **Conclusion:** RPH represents a significant but uncommon complication following kidney transplantation. Timely identification and
17 surgical intervention are essential for favorable outcomes. Despite the immunosuppressive risks, the incidence of RPH remains
18 relatively low. Careful surgical planning is crucial to mitigate complications, and ongoing research is needed to refine treatment
19 strategies, particularly exploring laparoscopic approaches in select cases.

20 **Keywords:** Case report, renal paratransplant hernia, hernia, emergency, incisional hernia, kidney transplant.

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27 Background

28 Kidney transplant is deemed to be the gold standard
29 treatment for end-stage renal disease due to its higher
30 survivability rate, quality of life, and cost-effectiveness
31 than dialysis [1]. However, certain complications might
32 occur after the transplant which include infection, wound
33 dehiscence, incisional hernia (IH), and in rare cases renal
34 para-transplant hernia [2]. Paratransplant hernia, though
35 uncommon, poses a potentially life-threatening crisis fol-
36 lowing renal transplantation surgery. It occurs when there
37 is a defect in the peritoneum, the membrane surrounding
38 the transplanted kidney, leading to entrapment of the small
39 intestine. This entrapment can cause bowel obstruction,
40 ischemia, and necrosis, with symptoms often presenting
41 subtly in immunosuppressed patients, leading to delayed
42 diagnosis and increasing the risk of severe adverse out-
43 comes, including multiple organ failure [3]. This compli-
44 cation typically arises due to inadvertent damage to the
45 peritoneum during the surgical process of creating space
46 for the kidney or during closure, where stitches may inad-
47 vertently tear the peritoneum [4]. Therefore, this is a report

of a case of a post-renal transplant patient presenting with
abdominal pain and vomiting who underwent immediate
laparotomy for an obstructed hernia at the transplant sur-
gery site.

Case Presentation

A 57-year-old male, a known case of non-alcoholic fatty
liver disease with F2 fibrosis, with end-stage renal dis-
ease secondary to IgA nephropathy, biopsy-proven 7 years
prior. The patient also suffers from myelofibrosis and is
JAK 2 positive in genetic testing done in 2016. He is also
being treated with Ruxolitinib for polycythemia vera and
has a history of renal stones. The patient underwent a liv-
ing-related renal transplant (from son) and was discharged
12 days later. The patient was clinically and hemodynami-
cally stable; with good oral intake and urine output; and
stable graft function with no pain. On post-op day 18, the
patient presented to the emergency room (ER) with epi-
gastric abdominal pain since morning, non-radiating and
unrelated to food, with no clear triggers. He vomited twice,
with moderate amounts of non-bilious, non-projectile,

68 and non-bloody food content. Additionally, the patient
69 experienced diarrhea for the past 3 days, characterized by
70 watery, non-bloody stools of normal color, occurring at a
71 frequency of two episodes per day.

72 Vitals at presentation were as follows: blood pressure
73 143/68 mmHg; heart rate 86 bpm; respiratory rate 18
74 bpm; temperature 36.8°C; and SpO₂ 99%. Upon exam-
75 ination, the patient was conscious, alert, and oriented
76 with a Glasgow Coma Scale of 15/15. Chest auscultation
77 revealed equal bilateral airway entry and normal cardiac
78 sounds (S1, S2) without murmurs. The abdomen was dis-
79 tended at the surgical site, soft, lax, and tender, with neg-
80 ative findings for Murphy’s sign and rebound tenderness.
81 The neurological assessment showed no deficits, and there
82 were no signs of lower limb edema or deep vein throm-
83 bosis. While the patient was in ER, he developed a bulge
84 at the incision site of his renal transplant associated with
85 severe pain and multiple episodes of vomiting. There was
86 a swelling seen at the incision site and tenderness on pal-
87 pation, and the swelling could not be reduced. The skin
88 was intact, small stable ecchymosis was seen, and clips
89 were in place. No suprapubic tenderness was present, and
90 voiding was free.

91 Laboratory findings showed lactic acid 3.54 mmol/l,
92 ESR 17 mm/hour, CRP 1.0 mg/l, WBC $15 \times 10^9/l$, Hgb
93 10.4 g/dl, creatinine 108 $\mu\text{mol/l}$, GFR 69, and LDH 293
94 U/l (Table 1). Abdominal wall ultrasound was performed
95 which showed a C-shaped small bowel loop in the right
96 iliac fossa with afferent and efferent entering adjacent
97 to the interior pole giving a double beak sign. A maxi-
98 mum small bowel diameter of 3.2 cm with preserved

99 vascularity was seen in color Doppler images. The urinary
100 bladder appears under distended with stents noted within.
101 The impression is suggestive of IH and small bowel close
102 loop obstruction was herniated through the defect in the
103 peritoneal and fascial defect and simple collection was
104 noted at the transplanted kidney hilum.

105 The patient was admitted for an exploratory laparot-
106 omy due to an abdominal bulge at the previous kidney
107 transplant site. During the exploratory laparotomy, the
108 surgical team reopened the old wound scar and evacuated
109 a large amount of seroma fluid. Upon exploration, a loop
110 of the small bowel was found herniated through a defect
111 in the peritoneal and fascial layers, though there were no
112 signs of ischemia. The bowel was carefully repositioned
113 into the abdominal cavity, and the peritoneal defect was
114 repaired using non-absorbable sutures in a multi-layered
115 interrupted fashion. The team proceeded to close multi-
116 ple layers of the abdominal fascia with looped Nylon and
117 reinforced Ethibond sutures, ensuring a secure closure. A
118 subcutaneous drain was placed, and the skin was closed
119 using skin clips with a Silvercel pressure dressing applied.
120 The patient tolerated the surgery well without any compli-
121 cations, with an estimated blood loss of 5 ml and no need
122 for a blood transfusion. Postoperative care was provided,
123 and the patient was discharged in stable condition.

124 Discussion

125 Renal paratransplant hernia (RPH) is considered to be
126 an uncommon type of IH [5,6]. It occurs as a result of
127 various reasons, which could be due to inappropriate
128 maneuvers during kidney grafting, stitches during the
129 closure of the peritoneum causing a tear, or a rupture of
130 posttransplant lymphocele [7,8]. Most cases occurred
131 early post-renal transplant complications and among
132 males with a mean age of 41.2 years [6,7]. It is crucial
133 to suspect hernia among post-renal transplant patients
134 showing clinical manifestations of small bowel obstruc-
135 tion which mandates surgical management immediately.
136 Although kidney transplant recipients are expected to
137 have an elevated risk of developing an IH due to immuno-
138 suppressive therapy and increased postoperative infection
139 risk, the incidence of IH in these patients is surprisingly
140 lower than in the general population, ranging from 1.1%
141 to 18% [2]. Furthermore, the incidence of RPH is even
142 rarer, with an incidence rate ranging between 0.18% and
143 0.45% [3]. Gao et al. [5], reported 3 cases of RPH out
144 of 668 patients who underwent renal transplants from
145 1993 to 2007. One of the patients developed the hernia
146 3 days after the transplant and complained of abdominal
147 pain, distention, and nausea without vomiting, the patient
148 needed laparotomy as per computed tomography (CT)
149 showing small bowel loops between the allografts and the
150 bladder, unfortunately despite the antibiotic’s coverage,
151 and admission into intensive care unit, after 1 week of
152 surgery, the patient died of multiple organ failure. While

Table 1. Laboratory results.

| EXAM | REFERENCE RANGE | RESULT |
|-------------------|----------------------------|-----------------------|
| Lactic acid | 0.7-2 mmol/l | 3.54 mmol/l |
| ESR | 0-15 mm/hour | 17 mm/hour |
| CRP | 0-5 mg/l | 1 mg/l |
| White blood cells | $4-11 \times 10^9/l$ | $15 \times 10^9/l$ |
| Red blood cells | $4.5-6.5 \times 10^{12}/l$ | $4 \times 10^{12}/l$ |
| Lymphocyte | $1.5-4 \times 10^9/l$ | $0.39 \times 10^9/l$ |
| Monocyte | $0.2-0.8 \times 10^9/l$ | $0.13 \times 10^9/l$ |
| Neutrophils | $2-7.5 \times 10^9/l$ | $13.6 \times 10^9/l$ |
| MCH | 27-32 pg | 26.3 pg |
| MCHC | 32-36 g/dl | 30.4 g/dl |
| Creatinine | 65-112 $\mu\text{mol/l}$ | 108 $\mu\text{mol/l}$ |
| GFR | 60 ~ | 69 |
| LDH | 100-217 U/l | 293 U/l |
| Hgb | 13-18 g/dl | 10.4 g/dl |
| Platelets | $150-450 \times 10^9/l$ | $260 \times 10^9/l$ |
| INR | 0.2-1.2 | 1 |
| PT | 11-14 second(s) | 12 second(s) |
| PTT | 26-41 | 32 |

153 the other two patients, complained of abdominal pain, 3–4
 154 days post renal transplant, and the imaging suggested a
 155 hernia and required laparotomy, and then they were dis-
 156 charged in good condition after 14–20 days of laparot-
 157 omy. The symptoms of small bowel obstruction such as
 158 abdominal pain, distention, and nausea/vomiting consid-
 159 ered nonspecific in which it could be a secondary effect
 160 of anesthesia alongside the fact that symptoms of parti-
 161 tionists can be masked by the large doses of corticosteroid
 162 to transplanted patients [6,9]. Therefore, CT is considered
 163 the preferable modality for identifying RPH as the latest
 164 2 cases reported by Gao et al. [5] had the CT performed
 165 earlier than the first case that died. Therefore, this man-
 166 dates the crucial of taking immediate actions and thinking
 167 to achieve proper outcomes, especially for immunosup-
 168 pressive patients. Upon confirming the diagnosis of RPH,
 169 it is critical to proceed with early surgical intervention,
 170 typically through immediate laparotomy. The surgical
 171 management of RPH presents unique challenges due to
 172 the small size of the peritoneal defect, which increases
 173 the risk of strangulation. Additionally, bowel necrosis in
 174 transplant patients is associated with a high mortality rate,
 175 approaching 80% [6]. Therefore, the surgical approach
 176 must be meticulously planned to minimize the risk of graft
 177 injury during small bowel manipulation and to address the
 178 need for intestinal resection if bowel necrosis is detected.
 179 Although it is not common, a case report done by Igarashi
 180 et al. [3] showed that surgical intervention using laparo-
 181 scopic exploration can become a treatment option and that
 182 it can be used to treat small bowel obstruction in selective
 183 patients with great outcomes. However, due to the lack of
 184 reports using this method, further studies should be con-
 185 ducted [3].

186 Conclusion

187 In conclusion, RPH represents a relatively uncommon but
 188 significant complication following kidney transplantation,
 189 often attributed to procedural mishaps during grafting or
 190 complications like lymphocele rupture. Early identifica-
 191 tion of RPH is crucial, especially in the presence of symp-
 192 toms indicating small bowel obstruction, to prompt timely
 193 surgical intervention and optimize patient outcomes.
 194 Despite kidney transplant recipients being at heightened
 195 risk for IHs due to immunosuppressive therapy and infec-
 196 tion susceptibility, the incidence of IH, including RPH,
 197 remains lower than expected compared to the general pop-
 198 ulation. Surgical management of RPH poses challenges
 199 due to the risk of bowel strangulation and high mortality
 200 rates associated with bowel necrosis, necessitating care-
 201 ful surgical planning and consideration of potential graft
 202 injury. Emerging techniques such as laparoscopic explo-
 203 ration show promise in selected cases but warrant fur-
 204 ther investigation to establish their efficacy and safety in
 205 this patient population. Continued research in this area is
 206 essential to refine diagnostic and therapeutic approaches

and improve outcomes for kidney transplant recipients 207
 affected by RPH. 208

What is new?

The literature recognizes RPH as a rare but significant com-
 plication of kidney transplantation. While previous cases
 have highlighted its risks, this manuscript presents a novel
 case of RPH with small bowel obstruction managed surgi-
 cally, contributing further insights into its timely diagnosis
 and treatment.

List of Abbreviations

| | | |
|-------|--|-----|
| CT | Computed tomography | 217 |
| CRP | C-reactive protein | 218 |
| ESRD | End-stage renal disease | 219 |
| GCS | Glasgow Coma Scale | 220 |
| GFR | Glomerular filtration rate | 221 |
| IgA | Immunoglobulin A | 222 |
| IH | Incisional hernia | 223 |
| INR | International normalized ratio | 224 |
| JAK | Janus kinase (associated with JAK2 mutation) | 225 |
| LDH | Lactate dehydrogenase | 226 |
| NAFLD | Non-alcoholic fatty liver disease | 227 |
| OR | Operating room | 228 |
| PT | Prothrombin time | 229 |
| PTT | Partial thromboplastin time | 230 |
| RPH | Renal paratransplant hernia | 231 |
| WBC | White blood cells | 232 |

Conflicts of interest

The authors declare that they have no conflict of interest
 regarding the publication of this case report.

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Consent for publication

Written informed consent was obtained from the patient.

Ethical approval

Ethical approval is not required at our institution to publish an
 anonymous case report.

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270 **Summary of the case**

| | | | |
|-----|---|-----------------------|---|
| 271 | 1 | Patient (Gender, age) | |
| 272 | 2 | Final diagnosis | RPH |
| 273 | 3 | Symptoms | Epigastric abdominal pain since morning, non-radiating and unrelated to food, with no clear triggers. He vomited twice, with moderate amounts of non-bilious, non-projectile, and non-bloody food content |
| 274 | 4 | Medications | Exploratory laparotomy |
| 275 | 5 | Clinical procedure | Exploratory laparotomy |
| 276 | 6 | Specialty | General surgery |