


## CASE REPORT

# Laparoscopic intraperitoneal mesh repair of a large incisional hernia in a kidney transplantation patient: A case report

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**Abstract**

A 73-year-old woman presented to our hospital because of painful bulging in the right lower abdomen, and developed a 17 × 12 cm incisional hernia after kidney transplantation using right oblique incision. Laparoscopic intraperitoneal onlay mesh (IPOM) repair was performed. Since a transplanted kidney is close to the abdominal wall defect, the space between the transplanted kidney and the abdominal wall was peeled off to secure enough space for the mesh to be placed. After that the fascial defect was detected precisely, and the polypropylene-polyglycolic acid composite mesh was fixed with 3 cm overlapping of the hernia ring by non-absorbable tacks. The patient was discharged 9 days after surgery. In general, abdominal incisional hernias after kidney transplantation are relatively large with boundary defect of abdominal wall ensuing between the abdominal and allograft. However, laparoscopic IPOM repair of incisional hernia after kidney transplantation can be performed safely and effectively.

**KEYWORDS**

incisional hernia, intraperitoneal onlay mesh, kidney transplantation

## 1 | INTRODUCTION

The laparoscopic intraperitoneal onlay mesh (IPOM) procedure for incisional hernias has become more common;<sup>1</sup> however, there have been few documented laparoscopic IPOM procedures for incisional hernia following kidney transplantation. Patients after kidney transplantation are affected by drugs, such as steroids and other

immunosuppressive medications that are disadvantageous for tissue healing. Moreover, laparoscopic repair of incisional hernia in these patients is challenging because of the technical skills required owing to the absence of a fascial margin at the lower edge near the iliac crest and the allograft.<sup>2</sup> We herein report a case of a large incisional hernia in a kidney transplantation patient successfully treated by minimally invasive laparoscopic IPOM repair.

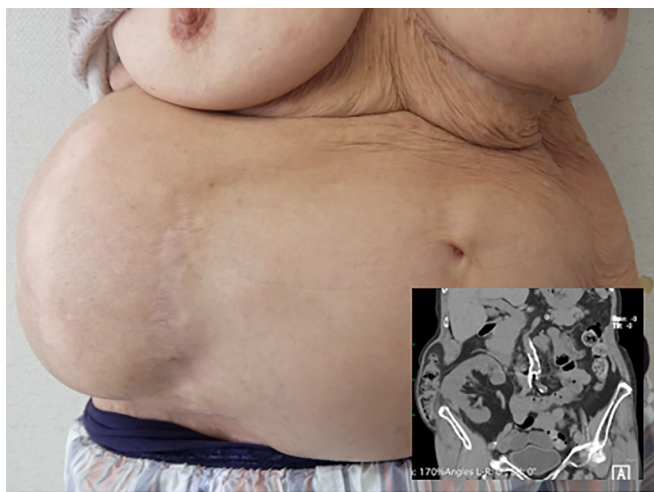
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## 2 | CASE PRESENTATION

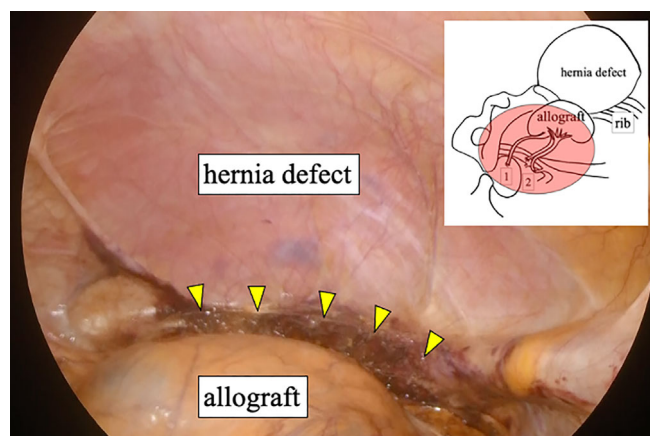
A 73-year-old woman with a history of end-stage renal disease secondary to hemolysis, elevated liver enzymes, and low platelets syndrome, required hemodialysis owing to sustained acute kidney dysfunction. At the age of 40, she received a kidney transplant from a living donor to the lower right quadrant. She was maintained on immunosuppressive therapy with prednisone and tacrolimus. Fifteen years later, she was diagnosed with an incisional hernia in the lateral aspect of the transplant incision that gradually and painfully increased in size. She was referred to our hospital after being refused medical treatment at other hospitals. Her body mass index was 17.4 kg/m<sup>2</sup>, and the bulge occupied the lateral part of the surgical incision. Palpation confirmed a hernia ring measuring approximately 15 cm. Computed tomography demonstrated a hernia defect close to the renal allograft (Figure 1).

Laparoscopic intraperitoneal repair was performed. Pneumoperitoneum was induced by an open technique through a 12-mm port (KII Balloon Blunt Tip System; Applied Medical, Rancho Santa Margarita, CA, USA) at the lateral edge of the left abdomen, and two operative 5-mm trocars (Optical Trocar; Medtronic, Minneapolis, MN, USA) were introduced into the upper and lower sides of the first port. Under direct view, exploration of the abdominal wall defect revealed no adhesions and confirmed that the defect measured 12 cm (lateral-to-medial) × 17 cm (superior-to-inferior) (Figure 2). We tried primary fascial closure using non-absorbable sutures prior to the mesh fixation; however, this was abandoned because of the large defect hole and difficulty

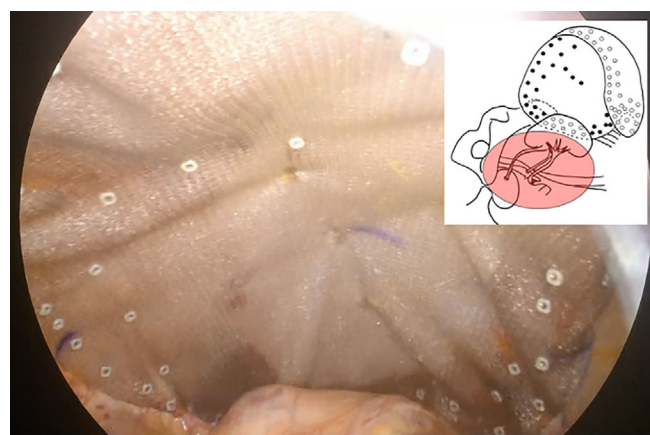


**FIGURE 1** Pre-operative photograph with the patient standing shows the right abdomen is prominently prolapsed. Abdominal computed tomography image shows a right-sided incisional hernia

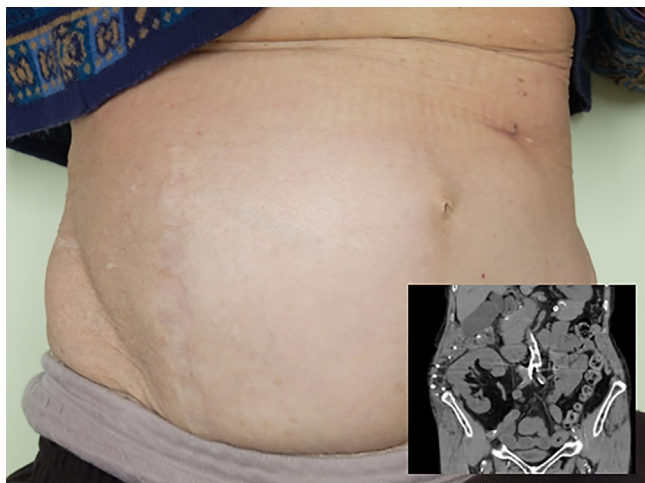
in suturing. Because the ventral side of the transplanted kidney was located near the abdominal wall defect (Figure 2), the dissection was performed carefully inside the abdomen, extending for approximately 3 cm, to allow safe intraperitoneal placement of the mesh with good overlapping of the hernia ring to reinforce the weak area near the abdominal wall defect. Next, a mesh with a positioning system (Ventralight ST with Echo 2; Bard, Warwick, RI, USA) was trimmed to 20 cm × 23 cm and fixed with five transfascial nylon sutures, which penetrated the entire abdominal wall and the mesh. We then fixed the mesh to the iliac crest by permanent fixation system (CapSure, BD, Franklin Lakes, NJ, US) with additional care in the vicinity of the graft, ureters and femoral



**FIGURE 2** Intra-operative image showing the hernia defect. Complete adhesiolysis between the hernia defect and the renal allograft was performed (yellow arrows). This red circle area contains the graft-ureter and vessels, so it is very dangerous to detach or fix the mesh here. 1: anastomosed ureter, 2: anastomosed vessels



**FIGURE 3** Completion of the intraperitoneal mesh repair with a composite mesh



**FIGURE 4** Photograph of the patient from the right side in the standing position after surgery shows that the hernia has been lifted and repaired. Postoperative abdominal computed tomography confirmed the repair

vessels at the inguinal area (Figure 3). In other areas, the mesh was fixed using double crown method according to the IPOM method. Operative time was 180 minutes, and she was discharged on postoperative day 9.

Postoperatively, a subcutaneous seroma developed in the dead space of the incised hernia and resolved 10 weeks later without intervention. Although the bulging was mildly admitted, the abdominal wall almost returned to its original state, and the patient's body contour improved (Figure 4). One year after the operation, the patient has not experienced any obvious recurrence.

### 3 | DISCUSSION

Abdominal incisional hernias are a complication of abdominal surgery, although the importance of conducting a two musculo-fascial layer parietal closure during renal transplantation in order to reduce the risk of developing an incisional hernia after surgery has been reported, approximately 3.8% of patients still develop this complication following kidney transplantation.<sup>3,4</sup> Incisional hernias after kidney transplantation are relatively large, with obvious left-to-right-side differences. These hernias adversely affect transplant patients' quality of life, and surgical treatment is required.<sup>5</sup> However, these hernias pose a serious problem regarding the effects of immunosuppression on wound healing and technical concerns regarding the proximity to the allograft and the absence of a fascial margin at the lower edge near the iliac crest.

Laparoscopic hernia repair has shown great promise recently because this approach avoids long postoperative hospitalization and reduces complication and recurrence rates compared with open repair.<sup>6</sup> However, in kidney transplant recipients, an established surgical method remains to be explained. To our knowledge, only a few reports have discussed using IPOM methods, and all patients were treated successfully.<sup>2,7</sup>

The handling of the transplanted kidney is most important in IPOM. In a normal oblique or transverse incision in the lower abdomen, the operative field may be closer to the area affected by the inguinal hernia. Exposing the hernia edges is essential for proper mesh coverage, and, as in general abdominal incisional hernia surgery, it is necessary to remove and expose Cooper's ligament and fix the mesh to the ligament, as with the usual transabdominal preperitoneal method.<sup>8</sup> However, in transplant recipients, the anastomosed ureters and femoral vessels are located near the inguinal area, which is a very dangerous area that should be avoided. According to the International Endohernia Society Guideline, it is certainly necessary to obtain mesh overlap of at least 3-5 cm or ratio of mesh cover to defect area at least 16:1 fixation with a tackler, but it is difficult for kidney transplantation patients due to anatomical abnormalities and it is insufficient for hernia repair and can lead to postoperative bulging.<sup>9</sup> However, it is important to recognize this area while obtaining accurate measurements of the hernia defect, and to avoid and securely reinforce the area.

Also, what we learned from this case is that IPOM-plus should be performed to prevent bulging. But the defect hole is large and tissues were too weak to be sutured. Therefore, we found we could not perform it. In such cases, it is necessary to consider how to deal with it, including extraperitoneal repair such as Transversus abdominis muscle release.<sup>10</sup>

Although the renal transplant population requires delicate surgical techniques and is affected by general health problems, laparoscopic IPOM repair of incisional hernias after kidney transplantation can be performed safely and effectively. We believe this case report will be a useful guide in the treatment of this disease.

### ACKNOWLEDGEMENTS

We thank Jane Charbonneau, DVM, from Edanz Group (<https://en-author-services.edanz.com/ac>) for editing a draft of this manuscript.

### AUTHORS' CONTRIBUTIONS

D.K., T.M., and T.H. performed the surgery and the perioperative management of the patient. D.K. and T.M. drafted the manuscript. R.K., H.N., A.H., Y.F., S.M., J.F., Y.T., N.N., T.M., H.F., and N.U. performed the

perioperative management of the patient. All authors have approved the manuscript.

### CONSENT FOR PUBLICATION

Written informed consent was obtained from the patient for publication of this case report and any accompanying images.

### DISCLOSURE

The authors declare they have no competing interests.

### DATA AVAILABILITY STATEMENT

The data that support the findings of this study are openly available from the corresponding author upon reasonable request.

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**How to cite this article:** Kaida D, Miyata T, Kin R, et al. Laparoscopic intraperitoneal mesh repair of a large incisional hernia in a kidney transplantation patient: A case report. *Asian J Endosc Surg*. 2022;15(1):180–183. <https://doi.org/10.1111/ases.12954>