



Laparoscopic Partial Nephrectomy for Multiple Masses in Situs Inversus Totalis

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Abstract

We report the case of a patient who was admitted to the emergency department of our hospital with acute left upper quadrant abdominal pain. Computed tomography revealed perforated cholecystitis and two synchronous incidental solid mass lesions in the right kidney. The patient had situs inversus totalis anomaly. The patient was evaluated by a multidisciplinary board, and simultaneous laparoscopic cholecystectomy and laparoscopic partial nephrectomy (LPN) were planned 3 months after cholecystostomy and antibiotic therapy. After uneventful laparoscopic cholecystectomy, synchronous renal masses were successfully treated with LPN. To the best of our knowledge, this is the first case report in the literature concomitant two synchronous renal masses with situs inversus totalis, which were treated with LPN.

Keywords: Laparoscopy, partial nephrectomy, situs inversus totalis

Introduction

Situs inversus totalis (SIT) is a rare anomaly in which intra-abdominal organs are transposed. Although there is no evidence of an increased risk of malignancy in patients with SIT, renal anomalies, including agenesis, dysplasia, hypoplasia, ectopia, polycystic kidney, and horseshoe kidney, have been reported (1).

Recent European Urology Association guidelines recommend partial nephrectomy as a standard of care for cT1 kidney tumors if it is technically feasible (2). In this case, we shared our experience with laparoscopic partial nephrectomy (LPN) in a patient with SIT and cT1 kidney tumors. To the best of our knowledge, this is the first case report in the literature concomitant two synchronous renal masses with SIT, which were treated with LPN.

Case Report

A 62-year-old male was admitted to the emergency department of Ondokuz Mayıs University Hospital with acute left upper quadrant abdominal pain. Computed tomography revealed perforated cholecystitis and two synchronous incidental solid mass lesions in the right kidney, 19x16 mm in the middle zone

lateral (RENAL score: 5) and 16x15 mm in the lower middle zone junction anteromedially (RENAL score: 8), and the heart and all intra-abdominal organs in the image area were displaced right-left (Figure 1).

The patient was evaluated by a multidisciplinary board, and simultaneous laparoscopic cholecystectomy and LPN were planned 3 months after the cholecystostomy. An informed consent form for the planned treatment was obtained from the patient. Laparoscopic cholecystectomy performed in the right 30-degree lateral and reverse trendelenburg position. After uneventful laparoscopic cholecystectomy, the patient was placed in a left 60 degree lateral position. Pneumoperitoneum was created using a Veress needle from Palmer's point, and after a 12 mm optical port, two 5 mm and one 12 mm working ports were placed. After medialization of the descending colon, the ureter was isolated and reached the hilum under the guidance of the ureter. There was one renal artery and vein. The masses were found under the guidance of laparoscopic ultrasonography, and the margins were marked with monopolar hook cautery. The localized mass in the hilar was excised off-clamp with cold scissors, and the defect was repaired with 3/0 poliglecaprone and 37 mm 2/0 braided polyglactin sutures. Then, the mass in

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the upper-middle pole lateral was removed off-clamp; however, because of the bleeding, the renal artery and vein were clamped with the help of bulldog clamps (Figure 2). Partial nephrectomy was performed by removing the mass using cold scissors. The defect was repaired with 3/0 poliglecaprone and 37 mm 2/0 braided polyglactin sutures (Figure 3). Bulldog clamps were removed. The warm ischemia time for the second mass was 7 min. Pathological examination revealed papillary and clear cell renal cell carcinoma for middle zone lateral and hilar masses, respectively. Both tumors were pT1a, WHO/ISUP grade 2, with negative surgical margins. The follow-up creatinine level was 0.88 mg/dL in the postoperative first month.

Discussion

In this case, a 62-year-old patient with SIT and synchronous renal masses was successfully treated with LPN. In the literature, only 13 case reports of concomitant SIT with renal mass have been reported, except our case. For the first time, Bertini and Boileau (3) reported open radical nephrectomy in a 54-year-old female patient in 1987. Open radical nephrectomy was performed in seven patients; laparoscopic radical nephrectomy in two patients; open partial nephrectomy in two patients; and robot-assisted LPN in one patient (4,5).

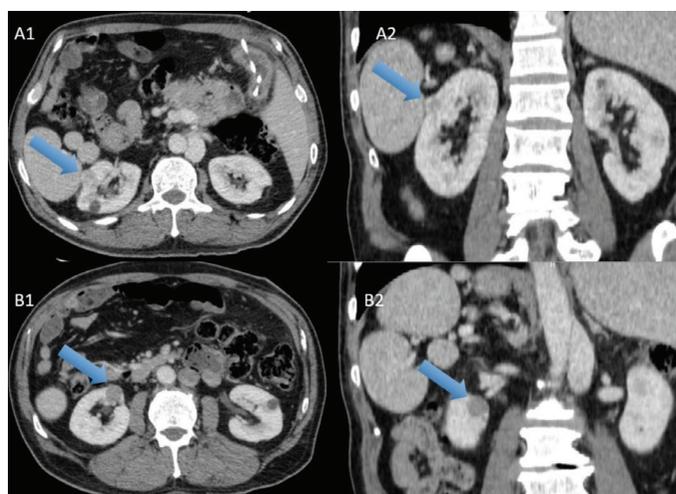


Figure 1. Patients computed tomography images. The masses are indicated by arrows

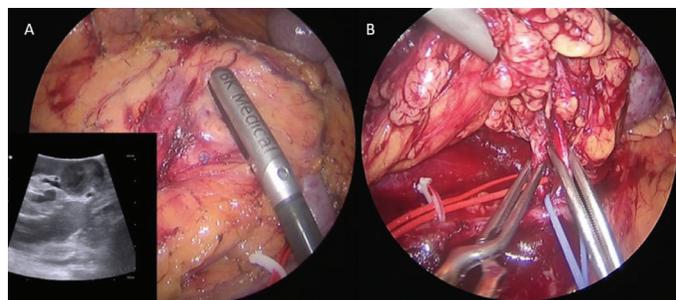


Figure 2. A) Intraoperative and laparoscopic ultrasound [4-Way Laparoscopic 8666-RF, BK Medical (Massachusetts)] image of the mass. B) Clamping of the renal artery and vein with the help of bulldog clamps (The mass in the hilar localized was excised off-clamp)

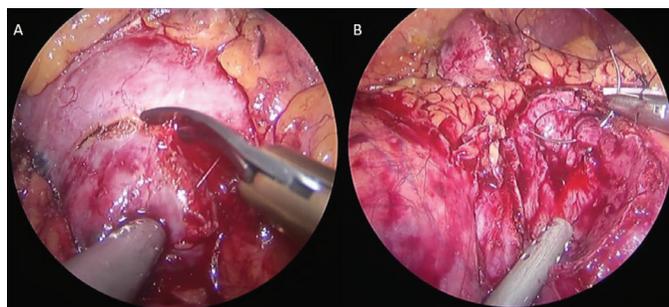


Figure 3. A) Resection of the mass with cold scissors, B) Reaping of the defect with 3/0 poliglecaprone and 37 mm 2/0 braided polyglactin sutures

Although LPN in patients with SIT proceeds with the same steps as in patients with normal anatomy, it may cause difficulty in orientation for the surgeon due to the transposition of the intra-abdominal organs. Technical difficulties and longer operative times have been reported in most cases of laparoscopic surgeries in patients with SIT because of disorientation caused by the reversed abdominal organs and the need to modify the surgeon's movements and techniques. Makiyama et al. (6) described the first case of laparoscopic nephroureterectomy in a patient with SIT, developed a laparoscopic simulator suitable for anatomy for preoperative training, and reported that preoperative training was useful.

Careful planning and execution of surgery are essential to minimize the risk of complications and ensure the best possible outcome for the patient. Computed tomography angiography is an imaging technique that allows for a detailed examination of blood vessels and their relationships to surrounding structures. With this information, the surgical team can identify the optimal approach to the affected kidney and plan the precise location and extent of the surgery. In cases where serious anatomical variations, such as SIT, may be present, computed tomography angiography imaging is a reliable method for anatomical detail and planning before partial nephrectomy in terms of oncological and functional outcomes.

With the increasing popularity of minimally invasive surgical procedures among surgeons, laparoscopic approaches for the treatment of renal mass are becoming more common. In patients with SIT, LPN follows the same procedures as normal anatomy and can be safely performed in experienced centers in terms of functional and oncological outcomes.

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Ethics

Informed Consent: An informed consent form for the planned treatment was obtained from the patient.

Peer-review: Externally peer-reviewed.

Authorship Contributions

Surgical and Medical Practices: E.K., E.Ö., Concept: E.K., M.G., Design: E.K., Data Collection or Processing: M.N.M., Analysis or Interpretation: M.G., M.N.M., E.Ö., Literature Search: O.K., Writing: E.K., O.K.

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