CLINICAL CASE

Pre-transplantation laparoscopic bilateral nephrectomy: two cases


Department of Urology, Hospital General del Estado de Sonora, SSA. Hermosillo, Sonora, Mexico

Received 1 October 2014; accepted 20 February 2015
Available online 12 June 2015

KEYWORDS
Nephrectomy; Bilateral; Transplant; Renal insufficiency

Abstract Laparoscopy has become a practical and acceptable alternative for the treatment of urologic diseases that are surgically complex. Kidney transplantation is the treatment of choice in the patient with end-stage kidney disease. The pre-transplantation indications for nephrectomy are: autosomal dominant polycystic kidney disease, refractory hypertension, chronic renal infections, diagnosis or suspicion of renal or urothelial cancer, urolithiasis, persistent levels of anti-glomerular basement membrane antibodies, significant uncontrolled proteinuria, and grade 4 or 5 hydronephrosis.

The cases are presented herein of 2 patients with end-stage kidney disease undergoing hemodialysis that required bilateral nephrectomy prior to the transplantation. In one case the specimens were extracted through the widening of the umbilical incision and in the other case through the Pfannenstiel incision. Surgery duration was 280 and 235 min, intraoperative blood loss was 250 and 155 ml, and hospital stay was 6 and 5 days, respectively. There were no complications.

Pre-transplantation nephrectomy is a common procedure in the kidney transplantation services and the ideal technique for its resolution is with minimally invasive procedures. The advantages of the laparoscopic procedure were particularly relevant in the present cases of bilateral nephrectomy.

© 2014 Sociedad Mexicana de Urología. Published by Masson Doyma México S.A. This is an open access article under the CC BY-NC-ND license (http://creativecommons.org/licenses/by-nc-nd/4.0/).

*Corresponding author at: Email: dr.victorperez@hotmail.com (V.M. Pérez-Mazanares).
Insufficiencia renal.

el tratamiento de elección en el paciente con insuficiencia renal terminal. Las indicaciones de nefrectomía pretrasplante son: enfermedad renal poliquística autosómica dominante, hipertensión refractaria, infecciones renales crónicas, diagnóstico o sospecha de cáncer renal o urolítico, urolitiasis, niveles persistentes de anticuerpos antígenos de la membrana basal glomerular, proteinuria significativa no controlada e hidronefrosis grados 4 o 5.

Se presentan 2 casos de pacientes con enfermedad renal terminal con manejo en hemodiálisis, los cuales requieren nefrectomía bilateral previo al trasplante. En un caso se extrajeron las piezas ampliando la herida umbilical y en el otro caso, a través de herida Pfannenstiel con tiempo quirúrgico: 280 y 235 min., respectivamente; sangrado transoperatorio: 250 ml y 155 ml, respectivamente; sin complicaciones. Estancia intrahospitalaria: 6 y 5 días, respectivamente.

La nefrectomía pretrasplante es un procedimiento habitual en los servicios de trasplante renal, y la resolución de la misma con procedimientos mínimos invasivos, es la técnica ideal. Tratándose ambos casos de nefrectomía bilateral hace de gran relevancia las ventajas del procedimiento laparoscópico.

© 2014 Sociedad Mexicana de Urología. Publicado por Masson Doyma México S.A. Este es un artículo Open Access bajo la licencia CC BY-NC-ND (http://creativecommons.org/licenses/by-nc-nd/4.0/).

Introduction

Laparoscopic surgery is gradually displacing open surgery, becoming an equally safe technique that can offer the advantages of better access to sites that are difficult to reach through open intervention. Great skill is required of the surgeon trained in these procedures that today are carried out not only in First World surgical centers, but worldwide. They are minimally invasive techniques that have the advantages of less postoperative pain, a faster recovery from surgery, shorter hospital stay, and an earlier reincorporation into daily activities.

Pre-transplantation nephrectomy indications are autosomal dominant polycystic kidney disease, medication-refractory renovascular hypertension, chronic renal infections, diagnosis or suspicion of renal or urothelial cancer, urolithiasis, persistent levels of anti-glomerular basement membrane antibodies, significant uncontrolled proteinuria, and grade 4 or 5 hydronephrosis.

Case presentations

Two laparoscopic pre-transplantation bilateral nephrectomies were performed. The first case was a 33-year-old man with a past history of 5 years of: smoking one pack of cigarettes daily, weekend alcoholism reaching drunkenness, and cocaine use. All of these habits were suspended 3 years ago. He had an appendectomy 15 years ago and a left tympanoplasty 2 years ago.

Two weeks before our evaluation, he was diagnosed with exacerbated chronic renal insufficiency demonstrated by upper digestive tract bleeding due to esophageal varices. He was under hemodialysis treatment of 3 sessions per week. The patient was neurologically sound, with skin and testicular pain, thin complexion, and BMI of 24. He had no cardiopulmonary involvement and a 6 cm abdominal scar in the right iliac fossa with no palpable abdominal masses. There was no edema in his extremities and his peripheral pulses had good intensity.

The laboratory work-up reported:
- CBC: Hb 10.9 g/dl; Ht 33.2%; platelets 376,000; leukocytes 9,200; neutrophils 67%; blood type and RH O+
- PT 12.4; INR 1.00; and PTT 27.1 s
- Blood chemistry: glucose 97 mg/dl; creatinine 12.10 mg/dl; urea 173 mg/dl; and BUN 81 mg/dl
- Serum electrolytes: Na 140 meq/l; K 5.87 meq/l; and Cl 92 meq/l

USG: Both kidneys with a thinned parenchyma; the right kidney had pyelocaliceal ectasia and proximal ureteral dilation and the left kidney had important pyelocaliceal ectasia suggestive of a hydronephrotic sac, but the left ureter was not dilated.

Noncontrast abdominal film: no alterations.
Cystogram: filling phase film with a maximum bladder capacity of 450 ml, no filling defects with bilateral vesicoureteral reflux, showing the fluid level under the left renal silhouette corresponding to a hydronephrotic sac (fig. 1).
CTU: Both kidneys with chronic changes in the renal parenchyma, the left kidney with pyelocaliceal ectasia and hydronephrotic sac with no evidence of obstruction due to stones.

The second case was a 38-year-old woman diagnosed with end-stage kidney disease of 5-year progression, secondary to high blood pressure of 15-year progression, under treatment with hemodialysis of 3 sessions per week. She presented with anuria for the last 5 years, underwent 2 cesarean sections, the last one 20 years ago, had breast implants 6 years ago, postoperative arteriovenous fistula in the right arm, and multiple transfusions.

The patient was neurologically sound, with skin and testicular pallor, a thin complexion with a BMI of 22.2, no cardiopulmonary involvement, a flat abdomen with a 0.5 cm reducible umbilical hernia, a Pfannenstiel suprapubic scar, and no abnormal organ enlargements or pain.

Laboratory work-up reported:
- CBC: Hb 9.2 g/dl; Ht 28.5%; platelets 215,000; leukocytes 8,100; neutrophils 64.6%; blood type and RH A+
Pre-transplantation laparoscopic bilateral nephrectomy: two cases

— PT 13.3; INR 0.99; and PTT 41.0 s
— Blood chemistry: glucose 86 mg/dl; creatinine 9.92 mg/dl; urea 116 mg/dl; and BUN 54.2 mg/dl
— Serum electrolytes: Na 138 meq/l; K 5.71 meq/l; and Cl 98 meq/l.

USG: A small 78 mm right kidney with loss of corticomedullary differentiation and cystic lesions between 7 and 15 mm and left kidney of 64 mm with loss of corticomedullary differentiation and a 8.2 mm cyst. The bladder was not visible.

Cystogram: bilateral vesicoureteral reflux, left side grade IV and right side grade II (fig. 2).

Programmed laparoscopic bilateral nephrectomy was performed as part of live-donor kidney transplantation protocol, with no complications.

The procedure was performed in patients diagnosed with end-stage kidney disease and pre-transplantation nephrectomy indication, for which the laparoscopic approach was decided upon due to its abovementioned advantages.

The conventional laparoscopic equipment of the hospital was employed. Two 10 mm trocars and one 5 mm trocar were placed for each kidney, using LigaSure®, a 30° lens, a Hem-o-lok® stapler, and a collection bag.

The patient was placed in the lateral decubitus position with forced flexion, putting small pillows at the costal level and between the legs, and a doughnut pillow at the head region. Previously anesthetized with general anesthesia, the patient was secured to the operating table with adhesive tape at the trochanter and shoulder level; antiseptic skin preparation was carried out from the chest to the pubis, comprehensively including the umbilical region and mid-section of the back.

The transperitoneal approach with the Hasson technique was carried out. The first 10 mm trocar was the optical one with a 30° lens and was placed in the umbilical position. The pneumoperitoneum was insufflated with 20 mmHg with CO2 and a 10 mm trocar was obliquely placed 10 cm from the first one, in the direction of the anterosuperior iliac spine and the third trocar was obliquely directed toward the middle part of the twelfth rib at 12 cm from the umbilical port. The pneumoperitoneum was lowered to 12 mmHg.

The descending colon and Toldt’s fascia were identified and the separation of the colon enabled adequate visualization of the anterior surface of Gerota’s fascia. Complete mobilization of the colon was required on both sides, from the hepatic or splenic angle to the iliac fossa, in order to completely expose the ureter (fig. 3). The ureter should be identified at the level of its intersection with the iliac vessels. The ureter was then dissected; its central part was located in the medial retropertitoneal fatty tissue with respect to the psoas muscle. During the proximal mobilization the primary gonadal vein can often be dissected together with the ureter. The ureter was located behind the gonadal vein and in front of the psoas muscle. Once located, the ureter was proximally dissected in order to identify the renal hilum.

The dissection of the ureter continued proximally, utilizing an irrigator-aspirator (fig. 4). The superior and lateral ligaments of the Gerota’s fascia were sectioned.
Once the ureter was dissected it was cut at the most distal part possible to aid in kidney traction.

Lower pole mobilization followed. Once the ureter was moved up to the ureteropelvic junction, the forceps were introduced behind Gerota’s fascia and the lower pole, following the psoas fascia. The specimen was detached in the superolateral direction, and using the irrigator-aspirator and LigaSure®, the ligaments of the inferior and posterior lateral wall were sectioned.

The renal artery and vein were dissected with the help of the aspirator-irrigator, angle forceps, and the electrocautery hook (fig. 5).

The renal vessels were tied, and renal vein visualization was achieved using the end of the irrigator-aspirator to dissect the individual layers of the lymph nodes and tissue from the lower pole of the kidney towards the renal hilum. The renal artery and vein were dissected and tied with Hem-O-Lok® and sectioned individually (fig. 6). The lower pole was pulled laterally to put the renal hilum in traction. The hilum was identified, displacing it in a cephalic direction along the medial surface of the ureter and renal pelvis, with the assistance of the irrigator-aspirator.

All the edges of the kidney unit were freed.

And finally, the collection bag was introduced and the surgical specimen was later placed in it and extracted through one of the working ports.

A Penrose drain was placed at the surgical site and the patient was repositioned to continue the procedure on the contralateral side.

The patient was repositioned and all the material was changed, requiring repeat antiseptic procedures in both the patient and the surgical team, with the exception of the instrumentalist.

**Results**

In the two cases, programmed laparoscopic bilateral nephrectomy was performed as part of live-donor kidney transplantation protocol, with no complications.
First case

Surgery duration was 280 min; intraoperative bleeding was 250 ml with no complications; the patient was ambulatory on the 2nd postoperative day; he tolerated oral food intake at 72 h after surgery; hospital stay was 6 days. The Visual Analog Scale for Pain was 0 with the use of a weak opioid (tramadol, 250 mg) and a NSAID after 72 h.

The patient was released hemodynamically stable, passing gases, afebrile, and tolerating oral food intake. He had no abdominal or chest pain. He was given a postoperative control appointment in the urology outpatient service. Both drains were removed at the first postoperative follow-up consultation, which was 10 days after surgery.

Second case

Surgery duration was 235 min; intraoperative bleeding was 155 ml with no complications: the patient was ambulatory 2 days after surgery; she tolerated oral food intake at 24 h after surgery; hospital stay was 5 days. The Visual Analog Scale for Pain was 0 with the use of a weak opioid (tramadol 250 mg) and a NSAID at 72 h. The patient was released hemodynamically stable, passing gases, afebrile, and tolerating oral food intake. She had no abdominal or chest pain. She was given a postoperative control appointment in the urology outpatient service. Both drains were removed at the third control appointment 19 days after surgery, due to persistent secretions.

Conclusions

Pre-transplantation nephrectomy is a common procedure in kidney transplant services and its resolution with minimally invasive procedures is ideal. The advantages of the laparoscopic procedure are greatly relevant in cases of bilateral nephrectomy.

Laparoscopic management of pre-transplantation bilateral nephrectomy is a feasible and safe procedure with the characteristic benefits of minimally invasive procedures. It has numerous advantages over open surgery, with low morbidity and mortality. This procedure can be performed in any conventional laparoscopy center in which the pertinent training has been carried out and it will not be long before it is considered the criterion standard in managing this type of patient.

Financial disclosure

No financial support was received in relation to this article.

Conflict of interest

The authors declare that there was no conflict of interest.

References