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Case Report

Transperitoneal Laparoscopic Nephrectomy of Giant Hydronephrotic Kidney Secondary to Ureteropelvic Stenosis

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Abstract

Giant hydronephrosis is the accumulation of more than 1 liter of urine in the renal collection system; it is a rare condition. The treatment of these patients should not be delayed. There are many causes of giant hydronephrosis. If the kidneys are nonfunctional and the patient is symptomatic, nephrectomy may be necessary. Nephrectomy can be performed using an open, laparoscopic, or robotic approach. A 35-year-old male patient presented with left lumbar pain and abdominal swelling. A nonfunctional giant hydronephrotic kidney passing the abdominal midline to the opposite side secondary to uretero-pelvic region stenosis (UPRS) was found. A transperitoneal laparoscopic nephrectomy was performed. The case and the treatment are discussed in the context of the literature.

Keywords: Giant hydronephrosis, laparoscopic transperitoneal nephrectomy, uretero-pelvic region stenosis

Cystic masses of the kidney are mostly asymptomatic and are detected incidentally during physical examination.[1] Only a small percentage of these cystic masses cause hydronephrosis. Giant hydronephrosis is the accumulation of at least 1 liter of fluid in the renal collecting system.[2] The condition may lead to compression of the ureter, intestines and vessels. The cause can be benign or malignant renal pathologies and require nephrectomy. The most common benign kidney pathologies requiring nephrectomy are symptomatic hydronephrosis, advanced renal dysfunction due to UPRS, atrophic kidney due to renal and ureteral stones, polycystic kidney disease, infections and renal trauma.[3, 4]

Uretero-pelvic region stenosis defines the clinical condition of obstructed urine flow from the renal pelvis to the proximal ureter and the resultant potential collecting system enlargement and kidney damage. UPRS restricts urinary passage from the renal pelvis to the ureter and causes progressive renal failure if left untreated.[5] Hypertrophy develops in the renal pelvis to provide sufficient urinary flow against this obstruction and can lead to irreversible renal injury as a result of the pressure increase.[5, 6]

Laparoscopic nephrectomy (LPN) is a commonly used method in urological surgery and has become popular in many centers due to advantages such as less pain, short hospitalization duration and good cosmetic results compared to open nephrectomy.[7] Robotic nephrectomy is also being used at an increased frequency. We aimed to discuss a case that was diagnosed with giant hydronephrosis and underwent transperitoneal laparoscopic nephrectomy after decreasing the kidney size intraoperatively in the light of the literature.

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Case Report

A 35-year-old male patient presented with abdominal pain and swelling. The patient's history revealed that he had presented to the hospital due to abdominal pain 5 years ago and had been recommended surgery for the swelling in the left kidney but had refused and had occasionally experienced abdominal pain without seeing any other physician. The urine, urine culture, hemogram and biochemical test results were normal. Ultrasonography revealed advanced hydronephrosis in the left kidney. Intravenous pyelography (IVP) showed that the right kidney was normal and the left kidney was nonfunctional with a 1 cm opacity in the pelvic bone region corresponding to the left ureter lower end (Fig. 1).

The right kidney was normal while the left kidney showed advanced hydronephrosis, passing to the other side of the abdominal midline, and was nonfunctional on computerized tomography (CT). There was also no dilatation in the left ureter or a stone opacity in the distal ureter (Fig. 2). Renal scintigraphy showed normal right renal blood vascularization and functions without any hemorrhage or function in the left kidney in addition to advanced hydronephrosis extending to the pelvic bone. Nephrectomy was planned considering a left nonfunctional hydronephrotic kidney and the necessary consent was obtained from the patient.

We entered the bladder with ureterorenoscopy (URS) with the patient in the lithotomy position under general anesthesia. The left orifice was normal. The ureteropelvic region was reached with URS but no obstructive pathology or stone were observed in the lower and middle ureter sections. We could not pass from the ureteropelvic junction to the kidney with the renoscope so the procedure was ended and converted to LPN as planned. We do not normally perform the URS procedure before each LPN. The reason for performing it in this patient was to perform nephrectomy together with the patient's stone if the opacity observed on IVP was a stone although no stone was observed on CT. An 18 F foley catheter was inserted and the patient was placed in the left semi flank 45o- 60o position for laparoscopic nephrectomy. An incision approximately 1 cm long was made at the level of the umbilicus. The peritoneal cavity was entered with a veress needle. After making sure that the syringe had entered inside the peritoneum, pneumoperitoneum was created and a 10 mm trocar was placed. Carbon dioxide pressure was kept at a mean value of 12-14 mmHg. The intraabdominal area was displayed with the aid of a 30-degree camera inserted through the umbilical cord and one 5 mm and 10 mm trocars were inserted lateral to the rectus muscle from the umbilicus level. After the kidney was generally released from the surrounding tissues, the kidney parenchyma was opened and a total of 4400 cc of fluid was aspirated (Fig. 3). Pyonephrosis was not observed. Hem-o-Lock clips were used to close the structures such as renal artery and vein during surgery. The carbon dioxide pressure was reduced to 4-6 mm Hg and hemorrhage control was terminated. A hemovac drain was placed at the surgery site (Fig. 4). Nephrectomy material was taken out of the body by performing a mini-incision in the endobag. The operation duration was 140 minutes and the hemorrhage amount was 50 cc. No complication occurred. The fluid coming from the drain on the postoperative 1st day

Figure 1. IVP image.

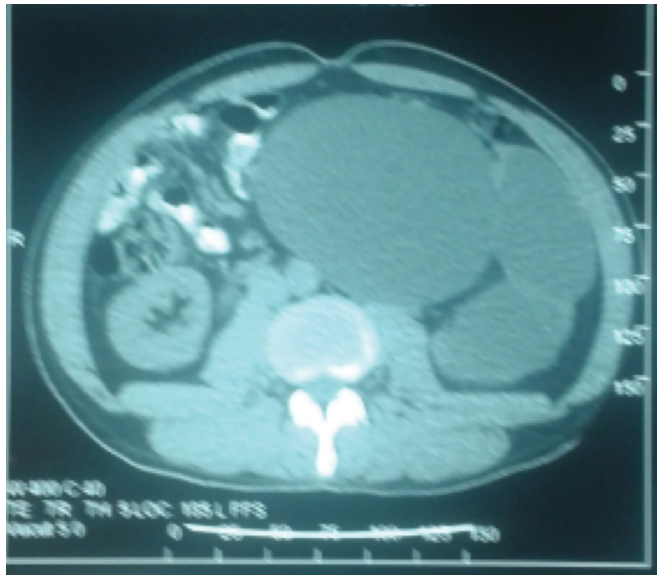

Figure 2. Tomografi image.

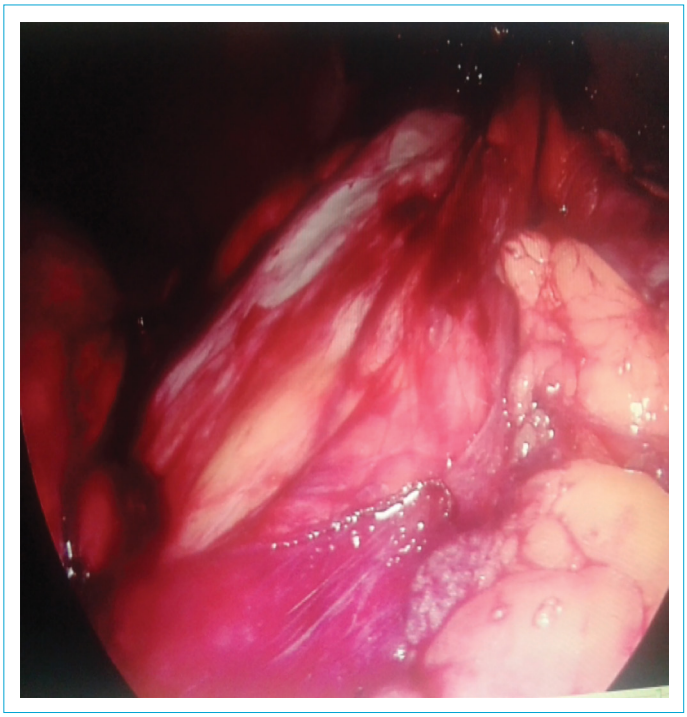

Figure 3. Intraoperative image.

Figure 4. Postoperative image.

was 500 cc. Nothing came from the drain on the 2nd day and it was withdrawn. The patient was discharged on the 3rd day. The pathology was a chronic pyelonephritic kidney.

Discussion

Although giant hydronephrosis cases have been reported in the literature, very few have contained more than 2 liters of fluid.[1, 2] Scrader et al. reported an adult giant hydronephrosis case containing 15 kg of fluid.[8] Yılmaz et al. have reported a pediatric giant hydronephrosis case containing 13.5 liters of fluid.[9]

Although most UPRS cases are congenital, symptoms may not appear until advanced ages.[10] Intermittent side pain sometimes accompanied by nausea and vomiting, is a common symptom in older children and adults. Patients may be followed up periodically by imaging methods, especially if the patient is asymptomatic and the physiological importance of the obstruction is unclear.[11] The aim of treatment is to remove the obstruction and correct the renal function. Symptomatic obstruction of the ureteropelvic junction should be treated surgically. The symptoms are thus eliminated and potential complications (stone, infection) prevented. A significant percentage of patients survive without the damages hydronephrosis can cause.

Symptomatic obstruction (recurrent side pain, urinary tract infection, etc.) should be surgically corrected with pyeloplasty. The success rates of laparoscopic and robotic surgery are similar to open surgery in experienced hands.[10] Nephrectomy is rarely needed in patients diagnosed with UPRS at present. If contralateral renal functions are normal and there is no function or severe function loss in the kidney with the stenosis, nephrectomy may be planned. Likewise, severe function loss with high stone load and chronic infection are also indications for nephrectomy in the kidney with a stenosis. The chance of kidney rescue is very low in adult patients with stenosis where kidney function is under 15%. Renal function can be maintained by performing percutaneous nephrostomy or placing a ureteral stent but nephrectomy will ultimately be needed in general. Although open surgery is still important, laparoscopic-robotic implementations now have equal surgical success rates. No matter how large the masses are, the mass size can be decreased intraoperatively and laparoscopic nephrectomy performed for large masses as experience with laparoscopy increases.

In conclusion, determining the degree of hydronephrosis that may develop due to UPRS, monitoring the patient for any progression and intervening on time are important to prevent nephron loss. However, hydronephrotic kidneys that are not monitored and treated become nonfunctioning over time. The LN approach to the nonfunctional kidney requiring surgery is advantageous due to the short postoperative inpatient stay, less pain and good cosmetic results. We also believe that LN can be used successfully by minimizing the kidney size with intraoperative methods in giant hydronephrotic kidney cases.

Disclosures

Peer-review: Externally peer-reviewed.

Conflict of Interest: None declared.

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

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