Endourology

Transperitoneal laparoscopic nephrectomy for giant hydronephrotic non-functioning kidney

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Introduction

The Hydronephrotic kidney when containing more than 1 L of fluid is called giant hydronephrosis (GH). Ureteropelvic junction obstruction (UPJO), is the most common cause of GH. With routine antenatal ultrasound, UPJO and antenatal hydronephrosis are usually picked up and managed in the pediatric age group. Presentation of UPJO associated with GH is less common in adults. Majority of adults diagnosed with UPPJO and GH have loss of parenchyma and function of the affected kidney and nephrectomy will be the treatment of choice for such scenarios. Open simple nephrectomy has been described in the literature for treatment of GH, but few cases were reported managed with laparoscopic approaches. We present a case of laparoscopic transperitoneal nephrectomy in an adult with hydronephrotic non-functioning kidney containing 11 L of fluid.

Case report

A 54-year-old male patient presented with a complaint of progressive left-sided abdominal distension for the last ten years. Initially, the distension was not bothering the patient, but more recently, he starts to experience discomfort especially when laying down most probably due to pressure effect of the hugely hydronephrotic kidney on the adjacent organs and diaphragm. The abdominal distension was not associated with abdominal pain, renal colic, lower urinary tract symptoms, trauma, hematuria, loss of weight or appetite. Past surgical history was unremarkable. The general physical examination was grossly unremarkable. On abdominal examination, there was a notable sizeable abdominal distension; the left abdominal mass was occupying almost whole of the abdomen. The abdominal mass was non-tender on palpation, with a smooth surface and tense cystic in consistency. Work up including urine analysis, complete blood count, serum chemistries were within normal limits.

Ultrasound of the abdomen and pelvis showed left-sided large hydronephrotic kidney occupying the whole of the abdomen from epigastrium to pelvis and normal right kidney. Contrast-enhanced computed tomography of the abdomen and pelvis showed massive left hydronephrotic kidney (28 cm x 26 cm x 22 cm) without appreciable renal parenchyma or contrast uptake (Fig. 1). The giant hydronephrotic kidney with a picture of UPJO was occupying the whole abdomen and extending down to the pelvis and pushing the adjacent structures to the right side of the abdomen. There were multiple stones of different sizes within the obstructed non-functioning kidney. There was no excretion of contrast on delayed films and no soft tissue masses within the kidney. The right kidney was unremarkable on the CT scan. The nuclear study showed non-functioning left kidney (Fig. 2). The diagnosis of left-sided massive hydronephrosis in a non-functioning kidney secondary to UPJO was established, and left-sided transperitoneal laparoscopic nephrectomy was done (Fig. 3).

The operation was challenging for many reasons; first the kidney was occupying the whole abdomen and no safe place to establish the pneumoperitoneum without going into that kidney. For this reason, we started the procedure with an ultrasound-guided percutaneous aspiration of about 6 L of clear urine followed by creating pneumoperitoneum with Veress needle. Four laparoscopic ports were used, 10mm for the camera, one 10mm and two 5mm working ports. The second challenge we faced was the adhesions with surrounding structure secondary to recurrent infections from UPJ obstructions. The third challenge was the large surface area of the hugely hydronephrotic kidney which makes the handling of the kidney difficult in open surgery were more challenging during laparoscopic nephrectomy. After mobilizing the whole kidney, further drainage of another 5 L of urine was done thus about...
11 L of fluid drained in total. Control of the hilum was done with Vascular Endo-GIA 30/2.5mm, and the specimen was retrieved with 15mm Endobag. Patient has uneventful and smooth post-operative recovery.

**Discussion**

Massive or giant hydronephrosis (GH) is an uncommon presentation nowadays because of the early detection and availability of a wide range of accurate diagnostic modalities. It has been defined as the fluid within the pelvicalyceal system of more than 1000mls. Causes are multiple and most commonly due to UPJO. Other reasons include obstructing renal pelvic stones and other congenital malformations. UPJO leads to impairment flow of urine from the renal pelvis into the ureter resulting in gradual dilatation of pelvicalyceal system. Long-standing obstruction can lead to impairment of the affected kidney and usually ends up with non-functioning kidney if not picked up early and managed. It is more often seen in males more than females and more on the left side than on the right. Symptomatic non-functioning kidney usually managed by nephrectomy. Both open and laparoscopic simple nephrectomy of the giant hydronephrotic non-functioning kidney has been described in the literature. Laparoscopic nephrectomy for GH has been reported in few articles. Hemal’s et al., described a group of patients who underwent laparoscopic nephrectomies for GH with 6 L being the most significant volume of fluid aspirated. Different other case reports of laparoscopic nephrectomies have aspirated amounts
ranging from 1.2 to 2.6 L. In our case, we drained about 11 L of fluid in total making it the most significant volume in laparoscopic nephrectomy reported cases of giant hydronephrotic non-functioning kidneys. We elected to perform transperitoneal laparoscopic nephrectomy in this case for the well-established advantages of laparoscopic surgeries over open approaches. These advantages include less risk of bleeding because the size of the incision made is much smaller than incision made for open surgery. Pain with smaller incision size is much less after laparoscopic surgery. The length of hospital stay, as well as recovery time, are significantly shorter with laparoscopic approaches.

Conclusion

GH in a non-functioning kidney usually requires interventions. Minimally invasive LN is feasible and poses the advantages of the shorter hospital stay, less painkiller requirement, and faster recovery.

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