Case report

Minimally invasive management of massive giant hydronephrosis in tertiary care centre Northern Sri Lanka: A case report

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ABSTRACT

Introduction & importance: Giant hydronephrosis (GH) is defined as a kidney containing greater than 1000 ml of urine in its collecting system. It is a rarely presented condition in an adult. Common aetiology for GH is due to congenital ureteropelvic junction obstruction. We present a case of a late presentation of GH was being managed by a minimally invasive laparoscopic technique.

Case presentation: A 63-year-old Sri Lankan male presented with worsening of generalized abdominal swelling with vague abdominal symptoms for a six-month duration, found to have a GH of the left kidney on USS. The Contrast-enhanced computerized tomography (CECT) scan confirmed the diagnosis with 12l of fluid and possible ureteropelvic junction obstruction (UPJO). CT did not show any excretion of the left kidney. Hydronephrosis was drained one day before the surgery by a percutaneous nephrostomy tube. Laparoscopic transperitoneal nephrectomy was performed. The patient had a smooth and fast recovery.

Discussion: A neglected congenital UPJO can present with GH in adults. It causes vague abdominal symptoms like abdominal distension, dyspepsia, and fatigue. CECT will give the diagnosis and identify the aetiology of GH. Non-functional GH kidneys can be treated with nephrectomy by open or laparoscopic surgical technique. Laparoscopic nephrectomy shows less blood loss during surgery, less postoperative pain and early recovery after surgery. However, in GH, surgeons need the experience to overcome the challenges like adhesions and working in a small space.

Conclusions: The percutaneous nephrostomy decompression followed by laparoscopic transperitoneal nephrectomy is feasible for a massive GH.

1. Introduction

Giant hydronephrosis (GH) is defined as more than a litre of fluid occupies an adult's renal pelvis [1]. It is a rarely presented condition in an adult [2]. Commonly GH is due to congenital ureteropelvic junction obstruction (UPJO) [3]. GH usually presents with non-specific symptoms due to increased intraabdominal pressure like abdominal distension, nausea, vomiting, early satiety, blotting of the abdomen, and breathing problems. Traditionally it was managed to remove the cyst with non-functional kidney by open surgery [4]. Very few cases were reported with GH and undergone laparoscopic nephrectomy. Here we are registering a late presentation of GH and have undergone laparoscopic nephrectomy.

Written informed consent was obtained from the patient for publication of this case report and accompanying images. A copy of the written consent is available for review by the Editor-in-Chief of this Journal on request.

This case report has been prepared according to the SCARE 2020 guideline [7].

2. Case presentation

A 63-year-old man presented with gradually increased abdominal distention for a six-month duration. He did not show the features of intestinal obstruction, but he developed dyspnoea, features of gastroesophageal reflux disease (GERD) and bloating of the abdomen for the last three weeks duration. He has regular bowel habits with no per rectal bleeding. He has no urinary symptoms. During this presentation, he was diagnosed to have hypertension. Examination of the abdomen reveals that a large non-tender cystic mass occupies the whole abdomen.

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However, he did not have tenderness over the abdomen or costovertebral angle.

Ultrasound scan of abdomen and pelvis showed large hydronephrosis of the left kidney. It filled almost the whole abdomen from epigastrium to pelvis, more in favour of UPJO. The right kidney shows mild hydronephrosis with a hydroureter.

CECT scan showed the giant hydronephrosis (26.6 × 17.8 × 39.5 cm) of the left kidney with a thin rim of cortical tissue extending from the left renal fossa to the abdomen pelvis with no functional renal parenchyma. There was no contrast enhancement or excretion seen even in the delayed film. The left side ureter was not dilated. The right kidney showed mild hydronephrosis, hydroureter with uniform enhancement and excretion (Fig. 1).

He had a normal renal function with serum Creatinine of 102 μmol/L (62–115), and the serum urea was 18 mg/dl (12-15). His urine full report did not show pus cells or red cells, and CRP was 4.1 mg/L (0–3). His haemoglobin was 12.7 g/dL (12-15). There were no acquired causes for UPJO identified. After investigations, he was diagnosed as GH of the nonfunctioning left kidney due to congenital UPJO.

He has undergone USS guided pigtail drain tube insertion a day before surgery and around 11.5 l of fluid drained during the first 2 h after insertion. He did not show significant alterations in his cardiac parameters or dyspnoea during or after the paracentesis. The very next day, he underwent laparoscopic transperitoneal left nephrectomy.

The surgery was carried out under general anaesthesia. After inserting the 10 mm umbilical port using Hasson open technique [18], a pneumoperitoneum was created (Supine position). Then the patient has been turned to the left lateral position. Next, two five mm working ports were inserted on the left lumbar and epigastric regions towards the left hypochondrium, around five cm from the umbilical port.

The left colon was pushed up to the midline, and the hydronephrotic left kidney was separated from the mesocolon. In addition, the cyst wall separated from the lateral and posterior abdominal wall. The left renal artery and vein were divided between the hem-o-lok clips, and the ureter was divided near the ureteropelvic junction (UPJ). The umbilical port was extended to 3 cm, and the hydronephrotic left kidney was taken through it. There was a drain place at the dissected left kidney area. Blood loss during the surgery was 80 cc, and 15 cc and 5 cc serous fluid were noticed on postoperative day one and two accordingly, and then the drainage tube was removed. We completed the operation in 155 min.

Our patient developed postoperative ileus for three days, and then it was settled, took regular diet from postoperative day four and was discharged on postoperative day five. In his postoperative follow-up, renal function was normal with serum Creatinine of 96 μmol/L (Six months) (Figs. 2 and 3).

3. Clinical discussion

Giant hydronephrosis (GH) is a rare urological entity and variably defined as a kidney containing greater than 1000 ml of urine in its collecting system or a kidney that accounts for more than 1.6% of total body weight. The radiological diagnosis of GH is given when the
hydro nephrosis occupies a hemi abdomen, which meets or crosses the midline and is at least five vertebrae in length. Though congenital UPJO is not a widespread condition, it accounts for the most common cause of GH. It has female predominance (F:2.4 M:1) and is more often found on the left than on the right (1:8:1). Other congenital causes including ureteral ectopia, duplicated collecting system, renal malformations and polar or aberrant vessels. The adult-onset GH can be due to UPJ calculous, transitional cell carcinoma or squamous cell carcinoma of the renal pelvis and acquired stricture due to chronic inflammatory conditions like Tuberculosis [1,4-6].

GH is a slowly progressive disease. It can resemble a wide range of differential diagnoses includes intraperitoneal and retroperitoneal cysts, pseudomyxoma, renal tumour pancreatic pseudocysts, retroperitoneal tumour, and ovarian cysts or tumour. The patients with GH may remain asymptomatic until the late phase and present with vague symptoms such as dyspepsia, nausea, fatigue. Advanced cases can present with flank pain, urinary tract infection, renal insufficiency, or gross hemanuria after trauma. The rapid exacerbations of the condition have been reported in the literature [8-12]. Complications of long-standing GH include renal failure, recurrent infection, hypertension, malignant transformation and rupture [4]. However, our patient presented with abdominal distention for six months duration and three weeks history of vomiting unit with gross infection. In the salvageable kidney, a reconstruction was very vague and minimal until three weeks before he presented to our clinic.

Early diagnosis of UPJO is essential to the prevention of giant hydro nephrosis. The congenital causes of hydro nephrosis are diagnosed early in the intrauterine life by antenatal USS in the current era before they progress to GH. Though the diagnosis of GH is made with USS, the Computed tomographic scan will be more informative in view of finding the aetiology of the disease. Nuclear Isotope renography MAG3 (99mTc-hexamethylpropyleneamine(tetraacetic acid)) is used to assess the split renal function and excretion [13]. Voided urine carbohydrate antigen 19-9 (VUCA 19-9) is a non-invasive biomarker to diagnose and follow-up patients with congenital obstructive nephropathy. VUCA 19-9 was very high in patients with congenital obstructive nephropathy, and a remarkable decrease was seen after pyeloplasty. Thus, early diagnosis and treatment may be possible by using this test routinely in the future [14].

Most cases of GH are treated either by simple nephrectomy or renal sparing surgery. The treatment is individualized, and the management decision is made depending on the functional levels of the kidney. Simple nephrectomy is the treatment of choice for a very poorly functioning unit with gross infection. In the salvageable kidney, a reconstructive procedure should be planned depending on the anatomical configuration of the system. In a moderately dilated extra-renal system, reduction pyeloplasty with nephroscopy is a reasonable option. The entire intrarenal dilated collecting system is an ideal situation for calycoureterostomy. In patients with enormous calyceal dilatation, Boari flap and calyceal vesicostomy ensure wide, patent and dependent drainage [15].

The clinical evaluation of our patient mostly favoured long-standing neglected congenital UPJO with the recent rapid exacerbation in size. However, as the patient was symptomatic due to the mass effect of GH, and the intravenous urogram did not show any excretion or enhancement even in the delayed phase, without doing the functional assessment of the affected kidney, we planned for a nephrectomy.

Both open and minimally invasive laparoscopic nephrectomies have been described in the literature. The laparoscopic nephrectomy is effective by carrying the advantages of less blood loss, less pain, less abdominal scar, and expedited post-surgical recovery [16-17]. However, laparoscopically approaching large masses like long-standing GH is a technically tricky, challenging procedure and surgeons with significant experience should attempt it. Moreover, the retroperitoneal approach needs different surgical techniques to overcome the difficulties in creating the space and dissecting the large kidneys from the retroperitoneal space [17]. Because of these reasons, we selected the transperitoneal approach in our patient.

The laparoscopic transperitoneal nephrectomy was challenging for many reasons in our patient. First, the kidney occupied the whole abdomen with significant compression over the other visceras and major intraabdominal vessels. Second, the sudden decompression of GH may result in paracentesis induced circulatory dysfunction (PICD) anticipated in this patient [16]. Third, there was no safe place to establish the pneumoperitoneum without going into that kidney. For this reason, we inserted the ultrasound-guided percutaneous aspiration one day before the surgery. Almost 11.5 l of clear urine was drained. Intraoperatively, the kidney had significant adhesion with the anterior abdominal wall and transverse mesocolon due to the prolonged existence of the GH. The surgery was successful without any adverse events with minimal time consumption. Length of hospital stay, as well as recovery time, were significantly shorter.

4. Conclusion

A long-standing neglected Giant hydronephrosis due to congenital UPJO can present with recent exacerbation of symptoms. Though it is a rare clinical entity, it should be suspected of a massive abdominal swelling patient. Preoperative slow decoupling of hydro nephrosis will facilitate laparoscopic access and prevent complications due to sudden intraoperative decompression. The minimally invasive laparoscopic transperitoneal nephrectomy is a feasible option when the nephrectomy is indicated over open surgery.

Consent

Informed written consent was obtained from the patient for publication of the data and clinical images. A copy of the written consent is available for review by the Editor in chief of this Journal on request.

CRediT authorship contribution statement

SG made contribution to design the work, analyzed, and interpreted the patient data and wrote the manuscript, and JS analyzed and interpreted the patient data and wrote the manuscript. SG performed the surgical procedure, managed the patient perioperatively. Both authors read and approved the final manuscript.

Declaration of competing interest

Both authors disclose any financial and personal relationship with other people or organizations that could inappropriately influence their work.

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Guarantor

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Ethics approval

All procedures followed were in accordance with the institution's
ethical standards (Faculty of Medicine, University of Jaffna, Sri Lanka). Institution exempts ethics approval for case report.

Registration of research studies

Not applicable.

Provenance and peer review

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References

[1] W. Yang, S. Shen, C. Wu, Hydronephrosis and giant hydronephrosis, Chin. Med. J. 77 (1958) 257–259.
[2] Vishwanath M. Pattanshetti, M.K. Swamy, S.I. Neeli, Ashok S. Godhi, S.C. Metgud, Giant hydronephrosis, Indian J. Surg. 72 (Suppl 1) (2010) 359–350.
[3] Badr Alharbi, Transperitoneal laparoscopic nephrectomy for giant hydronephrosis a nonfunctioning kidney, Urol. Case Rep. 21 (2018) 110–112.
[4] K.S. Kaura, M. Kumar, A.K. Sokhal, et al., Giant hydronephrosis: still a reality!, Turk. J. Urol. 43 (3) (2017) 337–344.
[5] K.K. Crooks, W.H. Hendren, R.C. Pfister, Giant hydronephrosis in children, J. Pediatr. Surg. 14 (6) (1979) 844–850.
[6] P.H. Chiang, M.T. Chen, Y.H. Chou, C.P. Chiang, C.H. Huang, C.H. Chien, Giant hydronephrosis: report of 4 cases with review of the literature, J. Formos. Med. Assoc. 89 (9) (1990) 811–817.
[7] R.A. Agha, T. Franchi, C. Sohrabi, G. Mathew, A. Kerwan, A. Thoma, A.J. Beamish, A. Noureldin, A. Rao, B. Vasudevan, B. Challacombe, The SCARE 2020 guideline: updating consensus surgical CASe Riport (SCARE) guidelines, Int. J. Surg. 84 (2020) 226–236.
[8] P. Hisman, R.O. Oppenheimer, L.L. Katz, Accelerated obstruction at the ureteropelvic junction in adults, J. Urol. 129 (4) (1983) 812–815.
[9] G. Hu, M. Luo, Y. Xu, Giant hydronephrosis secondary to ureteropelvic junction obstruction in adults: report of a case and review of literatures, Int. J. Clin. Exp. Med. 8 (3) (2015) p. 4715–.
[10] C. Kaya, N. Pirincci, M.I. Karaman, A rare case of an adult giant hydronephrosis due to ureterovesical stricture presenting as a palpable abdominal mass, Int. Urol. Nephrol. 37 (4) (2005) 681–683.
[11] J. Mountney, C.R. Chapple, A.G. Johnson, Giant hydronephrosis—a diagnostic dilemma, Urol. Int. 61 (2) (1998) 121–123.
[12] A. Ardiçoğlu, V. Yüzgeç, M.K. Atikeler, E. Özdemir, A case of adult giant hydronephrosis as unusual cause of intraabdominal mass, Int. Urol. Nephrol. 35 (1) (2003) 7–9.
[13] H.J. Corbett, L. McCarthy, Hydronephrosis in children: pelviureteric junction dysfunction, Surgery (Oxford) 31 (3) (2013) 135–139.
[14] A.M. Kajbafzadeh, A. Elmi, S.S. Talab, H. Emami, S.A. Esfahani, P. Saeedi, Urinary and serum carbohydrate antigen 19-9 as a biomarker in ureteropelvic junction obstruction in children, J. Urol. 183 (6) (2010) 2353–2360.
[15] S.A. Shah, P. Ranka, S. Dodiya, R. Jain, G. Kadam, Giant hydronephrosis: what is the ideal treatment? Indian J. Urol. 20 (2) (2004) 118.
[16] B. Alharbi, Transperitoneal laparoscopic nephrectomy for giant hydronephrotic nonfunctioning kidney, Urol. Case Rep. 21 (2018) 110–112.
[17] A.K. Hemal, S.N. Wadhwa, M. Kumar, N.P. Gupta, Transperitoneal and retroperitoneal laparoscopic nephrectomy for giant hydronephrosis, J. Urol. 162 (1) (1999) 35–39.
[18] H.M. Hasson, A modified instrument and method for laparoscopy, Am. J. Obstet. Gynaecol. 110 (6) (1971) 886–887.