



Case Report

Conquering new battlegrounds: Successful management of isolated giant retrovesical hydatid cyst with robotic assistance

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Received 5 April 2019; received in revised form 29 April 2019; accepted 4 June 2019
Available online 13 December 2019

KEYWORDS

Retrovesical hydatid cyst;
Robotic pericystectomy;
Hydatid disease

Abstract Hydatid disease (HD) is an accidental human parasitic infestation by cestodes and is most commonly caused by *Echinococcus granulosus*. Liver happens to be the most common site of involvement, although involvement of other organ symptoms is not uncommon. Involvement of the retrovesical pouch by hydatidosis is generally secondary in nature with an incidence of 0.1%–0.5% only. Primary retrovesical hydatid cyst (RVHC) is extremely rare with only few cases in existing literature. RVHC can present with a wide gamut of symptoms ranging from asymptomatic to obstructive uropathy. A 38-year-old male presented to us with complaints of lower urinary tract symptoms (LUTS) and was found to have an isolated primary retrovesical hydatid cyst on evaluation. The RVHC had compressed the right ureter leading to a grossly hydronephrotic non-functional right kidney. The patient was started on albendazole therapy and underwent robot assisted right nephroureterectomy and partial pericystectomy for the RVHC. The postoperative period was uneventful with resolution of symptoms. This report highlights the various clinical presentations of RVHC as well as the minimal invasive management of this rare entity.

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Peer review under responsibility of Second Military Medical University.

1. Introduction

Hydatid disease is a parasitic infestation caused accidentally in humans by cestodes belonging to the genus, *Echinococcus*, which is most commonly *Echinococcus granulosus*. Liver happens to be the most common site of involvement. Retrovesical pouch involvement by hydatidosis is generally secondary in nature with an incidence of 0.1% to 0.5% only. Primary retrovesical hydatid cyst (RVHC) is extremely rare with only few cases in existing literature. We present the case of a 38-year-old male primary RVHC and right non-functioning kidney who was managed successfully with robotic assistance.

2. Case report

A 38-year-old sexually active healthy male presented to the outpatient department of our hospital with complaints of lower urinary tract symptoms (LUTS) with predominance of voiding symptoms along with dysuria. He denied any hematuria or graveluria and had normal bowel habits. Per abdomen examination revealed a large globular and cystic suprapubic mass extending up to the umbilicus which was firm in consistency. The mass measured 15 cm×20 cm in size, was dull to percussion and was immobile on respiration. On per rectal examination, the same mass was felt as a firm supraprostatic mass without infiltration of rectal mucosa or pelvic side walls. To characterize the pathology, the patient underwent an ultrasound of the abdomen and pelvis which demonstrated a grossly hydronephrotic right kidney with hydronephrosis (HDUN) and a large cyst in pelvis with multiple septations suggestive of daughter cysts. An IgG enzyme-linked immunosorbent assay (ELISA) for echinococcus was positive, which further reinforces the suspicion of hydatid disease (HD). All the other laboratory investigations were within normal limits with hemoglobin of 13.8 g/dL and serum creatinine of 0.8 mg/dL. A contrast enhanced CT (CECT) scan of the abdomen and pelvis was performed to rule out any other site of HD and elucidate the relationship of this cyst with surrounding structures. CECT revealed a non-enhancing large cystic lesion (17.5 cm×13.4 cm×14.5 cm) between the rectum and the urinary bladder with multiple daughter cysts within it (Fig. 1A). The mass displaced the urinary bladder anteroinferiorly (Fig. 1B and 1C) and compressed the right ureter causing upstream HDUN with renal parenchymal atrophy (Fig. 1D). No stigmata of hydatidosis was noted in the liver or the lung on CECT. A diethylenetriamine pentaacetate (DTPA) scan further demonstrated a relative function of 7.5% in the right kidney with obstructed drainage. All other blood investigations of the patient were within normal limits. With these investigations, a diagnosis of RVHC with non-functioning right kidney secondary to right ureteric obstruction was made and the patient was started on oral albendazole. After 2 weeks of albendazole therapy, the patient underwent robot assisted laparoscopic right nephroureterectomy and partial pericystectomy.

The laparoscopic right nephroureterectomy up to the common iliac bifurcation was performed in a routine

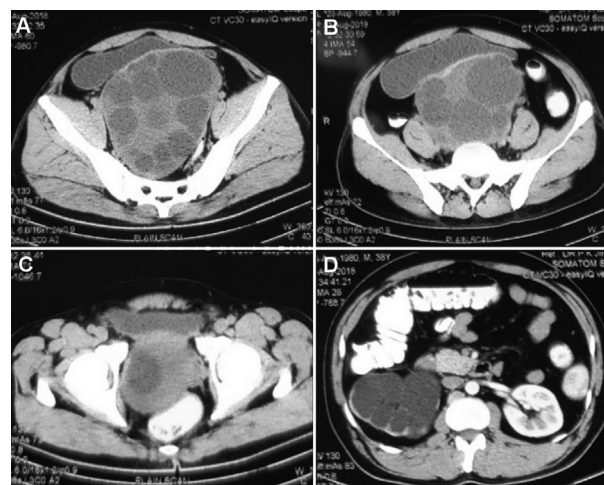


Figure 1 Contrast enhanced computed tomography (CECT) of the abdomen and pelvis. (A) Right kidney with gross hydronephrosis and thinned out renal parenchyma; (B) Relation of the retrovesical hydatid cyst with the urinary bladder and dense adhesions between the two, displacing the bladder anteriorly; (C) Hypodense retrovesical hydatid cyst with multiple daughter cysts causing displacement of the bladder; (D) Relation of the cyst deep down in the pelvis with dense adhesions with the surrounding structures.

fashion in the left lateral position and resected kidney bagged. Subsequently, the patient was laid in supine position and three ports were placed as in Fig. 2A with pelvic docking of the robot. The RVHC was densely adherent to the parietal abdominal wall, urinary bladder and the rectum (Fig. 2B). It was freed from the parietal wall and sigmoid colon using a combination of sharp dissection and bipolar cautery. After dissection over the superior surface of the cyst, the bladder was filled with saline to delineate the bladder from the cyst wall and avoid inadvertent injury to the adherent bladder (Fig. 2C). The superior surface of the cyst was packed with 10% povidone iodine soaked gauzes and prepared for a cystotomy. A 16 G needle was inserted through the abdominal wall into the cyst with the aid of the robotic arms and multiple cycles of injection and aspiration were performed using 10% povidone iodine as the scolical agent (Fig. 2D). Thereafter, a controlled cystotomy was made on the superior surface of the cyst and the contents were aspirated making sure to avoid any spillage of the contents (Fig. 2E). A routine laparoscopic suction tip was initially used to aspirate the cyst contents and the daughter cysts, but there was repeated clogging of the daughter cysts at the junction of the suction tip and the suction catheter which could have led to inadvertent delay as well as spillage of the contents (Fig. 2F). Hence, the wide bore suction catheter tubing without the tip itself was inserted into the peritoneal cavity through the 12 mm assistant port and guided into the cyst cavity by the console surgeon with the aid of the robotic arm (Fig. 2G). The suction catheter was manipulated into the cyst cavity. All the daughter cysts and scolices were suctioned out of the cyst with the aid of the robotic arm. Once all the contents of

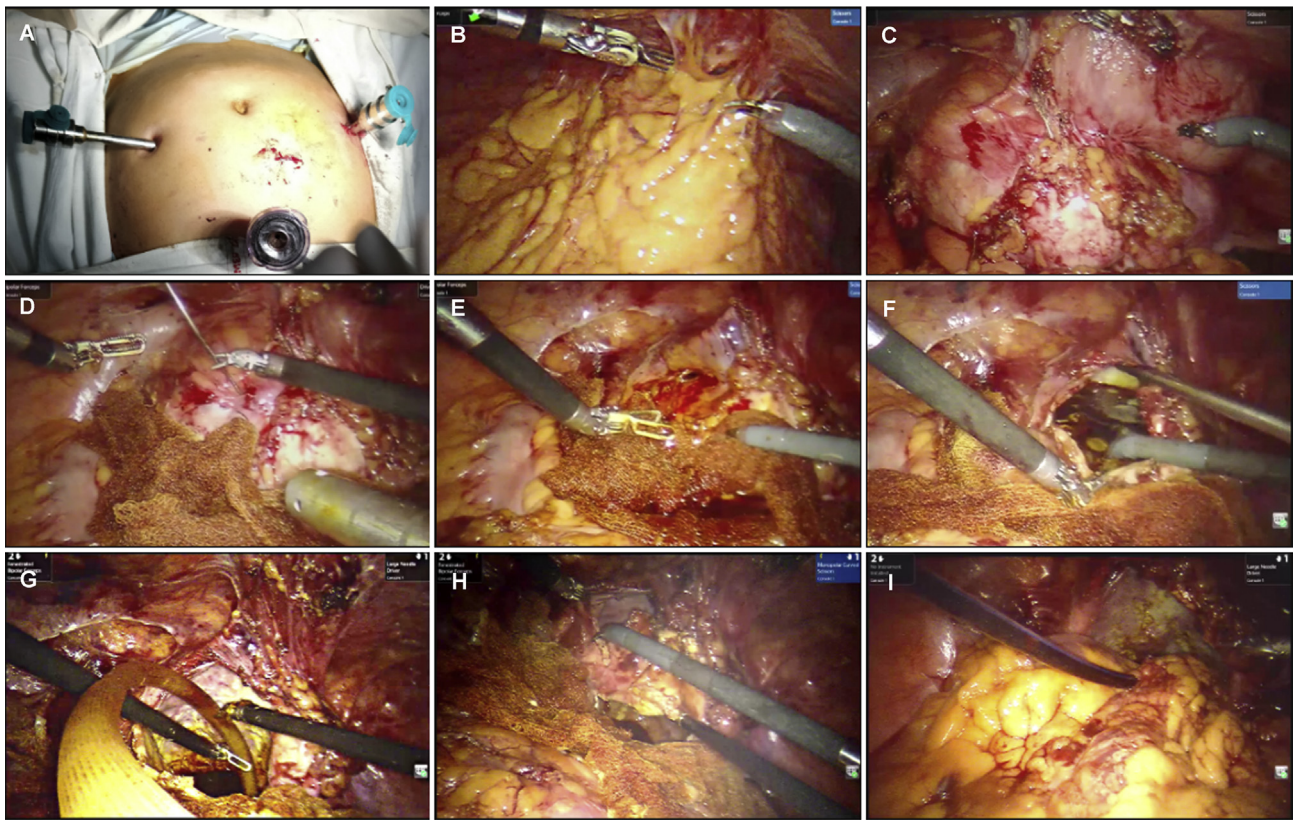


Figure 2 Operative findings. (A) Port placement—12 mm camera port in the supraumbilical region around 5 cm from the umbilicus; two 8 mm ports in the mid clavicular line along the rectus sheath on both sides. Additional port was inserted between the camera port and robotic port for assistance; (B) Dense adhesions between the parietal abdominal wall, sigmoid colon and bladder; (C) Filling of the urinary bladder with saline to appropriately judge the relationship and displacement of the urinary bladder to retrovesical hydatid cyst; (D) Puncture, irrigation and aspiration of the cyst after placing 10% betadine soaked gauzes; (E) Creation of limited cystotomy; (F) Suctioning of cyst contents with laparoscopic suction tip; (G) Suctioning of cyst with suction tip tubing with the aid of the robotic arm, increasing maneuverability; (H) Deroofing of the superior surface of the cyst; (I) Placement of omentum and drain into the cyst cavity after inspection and betadine wash.

the cyst were suctioned out, the cystotomy was enlarged and the cyst was deroofed. Further, the cyst cavity was inspected for any cystovesical communication or residual daughter cysts or contents and 10% povidine iodine was instilled into the cyst, painting all the walls of the cyst (Fig. 2H). Hemostasis on the cut edges of the cyst was achieved using electrocautery and omentum was packed into the cyst after placing a 18 Fr drain into the cyst and 24 Fr drain perivesically (Fig. 2I). The Nephrectomy specimen, cyst wall and the gauze pieces were bagged and brought out through a 5 cm flank incision (Fig. 3). The operative time was 175 min with a blood loss of 50 mL. The patient had ileus in the postoperative period which resolved by postoperative day (POD) 3 and was allowed orally thereafter. The postoperative course was otherwise uneventful and all the drains were removed by POD5, with the patient being discharged on POD6. The patient was started on albendazole tablet 400 mg twice daily in the postoperative period for a period of 3 months. After 1 year of follow-up, the patient recovered well, and was asymptomatic with no recurrent or residual disease on imaging.

3. Discussion

Echinococcosis or HD is a parasitic infestation caused accidentally in humans by cestodes belonging to the genus, *Echinococcus*, which is most commonly *Echinococcus granulosus*. Although HD most commonly involves the liver followed by lung, it spares no organ. Pelvis hydatidosis is a rare entity with an incidence of 0.20%–2.25% across literature. Retrovesical HD is even more unusual with an incidence of 0.1%–0.5% [1]. Horchani et al. [2] in their landmark series of 27 patients with RVHC reported an incidence of 1%–2% [2]. They classified RVHC into two subgroups: Intraperitoneal and subperitoneal. Intraperitoneal RVHCs tend to be located predominantly in the peritoneal cavity and are generally secondary in nature, occurring as a result of cyst seeding into the retrovesical pouch. They rarely cause compression of adjacent structures and displace the bladder downwards and forwards. Subperitoneal RVHCs on the other hand, are confined to the restricted space in the pelvic cavity and in turn, are closely related to the pelvic organs with a tendency to cause compression of the bladder, ureter as well as the urethra. This subtype is thought to arise as result of

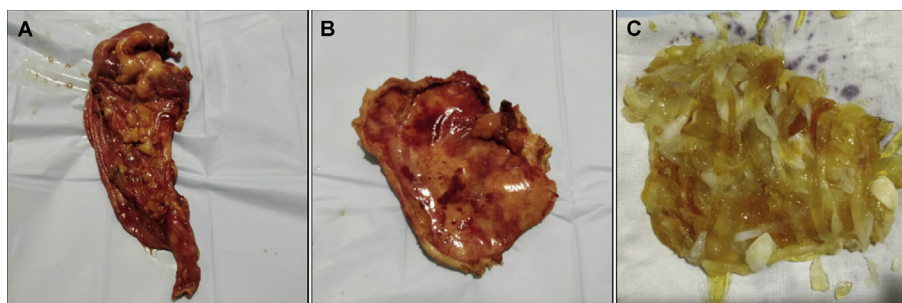


Figure 3 Resected specimens. (A) Resected nephroureterectomy specimen; (B) Cyst wall; (C) Cyst contents including multiple daughter cysts.

hematogenous seeding of echinococcus larvae into the perivesical tissue [2]. Patients with such RVHCs are mostly symptomatic. Presentations with obstructive uropathy, renal failure [3], acute urinary retention [4] as well as bilateral lower limb edema [5], have been reported. The index patient who had LUTS was also found to have a non-functioning right kidney due to the RVHC. The intimate relationship of subperitoneal RVHCs to the adjacent structures makes dissection and complete excision difficult and treacherous. Hence, cyst deroofing or partial pericystectomy is a preferable option in order to avoid injury to the nearby vital structures, as was the case in our patient. Partial pericystectomy also avoids manipulation of the neurovascular bundles and seminal vesicles located deep within the pelvis and prevents sexual dysfunction which may result from complete pericystectomy in young patients.

Majority of RVHCs have been operated by means of open surgery [2,6]. Minimally invasive surgery has come in the forefront for tackling these complex problems in the recent years. We have previously reported successful management of RVHCs using laparoscopic cyst aspiration, instillation and suction (LAIS) [7]. LAIS brought together the benefits of minimal access, controlled aspiration with spillage as well as avoided injury to surrounding structures. Subramaniam et al. [8] described the use of palanivelu hydatid system (PHS) for management of a RVHC with laparoscopic assistance. The PHS was essentially invented for management of complex hepatobiliary hydatid cysts and the authors extended its use for management of RVHC. Transurethral management of RVHC has also been described by Lezrek et al. [9]. However, this innovative technique finds utility only in patients with dense adhesion of the bladder wall with the RVHC, with no intervening bowel.

Robot assisted surgery is rapidly expanding its horizons into the management of such cases, well-equipped with three dimensional vision, endowrist technology as well as enhanced magnification in its armamentarium. Shailesh et al. [10] described the first case of robot assisted total pericystectomy in two patients and utilized the PHS for decompressing a large cyst prior to excision of the cyst in one patient. Albeit the gold standard, total pericystectomy was impossible in the index case due to its subperitoneal location and dense adhesions with the sigmoid colon, bladder and rectum. Robotic assistance also provided better maneuverability of the suction catheter into the inaccessible areas in the pelvis and RVHC, ensuring complete

clearance of the cyst contents while avoiding intraperitoneal spillage in the index case.

2. Conclusion

Robot assisted partial pericystectomy is a safe and feasible technique for management of RVHC, especially subperitoneal variants and provides the advantages of minimal access surgery to the patient whilst ensuring complete clearance with minimal spillage of cystic contents.

Author contributions

Study design: Santosh Kumar, Abhishek Chandna, Vignesh Manoharan.

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Data analysis: Santosh Kumar, Kalpesh M. Parmar.

Drafting of manuscript: Abhishek Chandna, Vignesh Manoharan.

Critical revision of the manuscript: Santosh Kumar, Kalpesh M. Parmar.

Conflicts of interest

The authors declare no conflict of interest.

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