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RETROPERITONEOSCOPIC HEMINEPHRECTOMY OF THE RIGHT UPPER COLLECTING SYSTEM EMPTYING INTO AN ECTOPIC URETEROCELE IN A 5-YEAR-OLD GIRL: A CASE REPORT

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A 5-year-old girl with a history of recurrent urinary tract infection since the age of 14 months was diagnosed as having a right duplicated urinary collecting system with the upper ureter ectopically opening in the urethra. She underwent retroperitoneoscopic heminephrectomy for a right dysplastic kidney and open ureterocelectomy and reimplantation of the refluxing lower ureter via Pfannenstiel incision. She survived the procedure without serious complications and resumed normal daily activities by day 6. To the best of our knowledge, this case is the 16th case of laparoscopic heminephrectomy for pediatric patients and the first case treated by the retroperitoneal approach in the English literature.

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Key words: Retroperitoneoscopic, Heminephrectomy, Ectopic ureterocele, Pediatric

INTRODUCTION

In the last few years laparoscopic surgery has become popular and has been widely used in pediatric urology¹⁻⁴. However, the dense areolar tissue and abundant retroperitoneal fat often obstruct the creation of a satisfactory pneumoretroperitoneal space to conduct retroperitoneoscopic surgery. Recently, a simple technique of retroperitoneal balloon dilation followed by retroperitoneoscopy has been used to perform various types of surgical procedures⁵. We performed retroperitoneoscopic heminephrectomy on a 5-year-old girl who had a non-functioning upper renal segment draining into an ectopic ureterocele and an intact lower segment with the refluxing ureter on the right side.

CASE REPORT

A 5-year-old girl with a history of recurrent urinary tract infection since the age of 14 months had been conservatively managed with oral antibiotics. She was 96 cm tall weighing 14.8 kg. The hemoglobin was 14.8 g/dl and hematocrit 43.9%. The serum creatinine was 0.3 mg/dl, blood urea nitrogen 16 mg/dl, potassium 4.3 mEq/L, and creatinine clearance 114 ml/min. Excretory urography and ^{99m}Tc-DMSA renal scintigraphy failed to visualize the upper segment of the right kidney. The ureter was connected to the lower segment and there was grade 3/5 reflux on voiding cystography (VCG). Cystoscopy documented a sphincteric ureterocele with an ectopic opening in the floor of the posterior urethra. On the left side a single orifice was located on the trigone (Fig. 1).

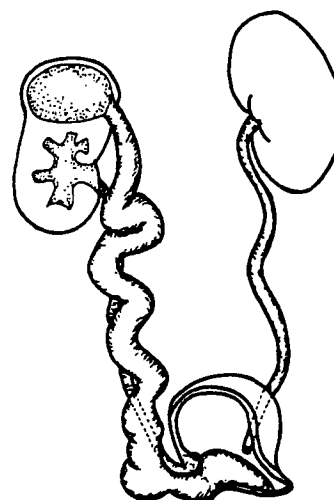


Fig. 1. The scheme of renal collecting system anomalies in this patient.

She underwent surgery in July 1998. After being placed in the lithotomy position, and an 8 Fr. ureteral catheter was introduced in the upper ureter as a marker for use during retroperitoneoscopic manipulation. With the patient in the left lateral decubitus position, a 2 cm incision was made just above the iliac crest in the midaxillary line, and a tract was created into the retroperitoneal space. A balloon dilator was inserted into this space according to the method of Gaur⁵ and was inflated with 150 ml of air for 15 minutes. A 10 mm blunt-tipped trocar (US Surgical Corporation, Norwalk) was inserted. The insufflation pressure was maintained throughout the procedure at 8 mmHg. Two additional 10 mm and 5 mm ports were established, one just under the

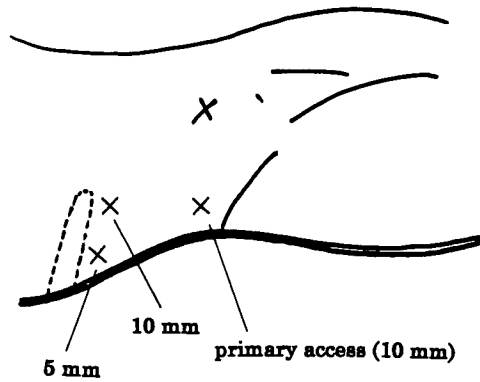


Fig. 2. Primary access port (10 mm) is placed just above the iliac crest. Two ports are placed under the 12th rib (10 mm port in the anterior axillary line and 5 mm port in the posterior axillary line).

12th rib in the anterior axillary line and the other in the posterior axillary line (Fig. 2). Only 1 segmental vessel was noted extending towards the upper pole from the major renal vessels, and ligated with endoscopic clips. Subsequently, the border between the upper and lower renal segments was readily identified, and parenchyma was divided using an Endo GIA autosuture instrument. No hemorrhage was noted on the cut surface. Then ureterocelectomy with retrieval of the resected organ was performed via a Pfannenstiel incision, after which neocystostomy of the refluxing right ureter was done according to Paquin's method. The procedure took 330 minutes in the retroperitoneoscopic heminephrectomy, and 195 minutes in the open ureterocelectomy and neocystostomy of the refluxing ureter. Blood loss was minimal, and the patient's

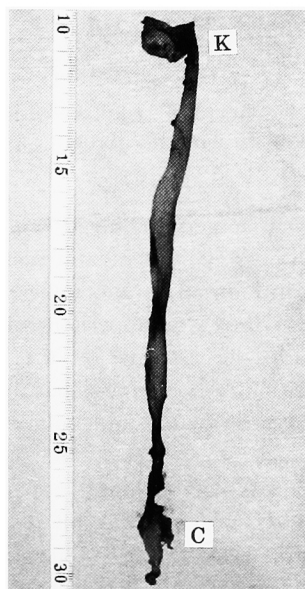


Fig. 3. The resected renal segment measures $3 \times 2 \times 1$ cm, and was histologically reported to be dysplastic. K, the upper pole. C, ureterocele.

vital signs remained stable throughout the procedure. The resected kidney segment measured $3 \times 2 \times 1$ cm and weighed 5 g (Fig. 3). Pathological examination revealed renal dysplasia with chronic inflammation. She started oral intake on day 1 and resumed normal activities on day 6. Intravenous pyelography (IVP) and VCG at 3 months postoperatively demonstrated the disappearance of vesicoureteral reflux and good renal function without urinary stasis.

DISCUSSION

In recent years, laparoscopic techniques have been extended to pediatric urology^{1,2)}, not only for the diagnosis of cryptorchidism, but also for more complex procedures, such as nephrectomy³⁾, and heminephrectomy^{4,6)}. So far, 15 pediatric patients who underwent laparoscopic heminephrectomy have been reported^{4,6)}. Jordan reported the initial case of laparoscopic heminephrectomy on a pediatric patient⁴⁾. Janetschek⁶⁾ reported a mean operative time of 222 minutes in 12 cases of heminephrectomy, including 427 minutes in 2 cases of heminephrectomy combined with a Pfannenstiel incision for ureterocelectomy and ureteral implantation of the remaining ureter, oral intake on day 1, and hospital stay after surgery ranging from 3 to 8 days. Surgery was performed via transperitoneal laparoscopic access in all reported cases. Among the pediatric patients, our case is the first case in which retroperitoneoscopic heminephrectomy was performed.

Although insufflation seemed unable to sufficiently break down the dense areolar tissue binding the fat in the retroperitoneum, the balloon dissecting techniques described by Gaur⁵⁾ allows the safe and reproducible establishment of a retroperitoneoscopic operating field. Retroperitoneoscopic nephrectomy resulted in a greater decrease in postoperative morbidity compared with transperitoneal laparoscopic nephrectomy and open surgery^{7,8)}. A disadvantage of retroperitoneoscopic access is to work in a smaller surgical field, especially in children. The use of new devices, however, can compensate for this disadvantage.

In our limited experience, laparoscopic heminephrectomy appears to be another option for minimally invasive treatment in children with disease affecting 2 sites in the collecting system. The small abdominal scars may provide a great cosmetic advantage for girls. The disadvantage of laparoscopy is to take a significantly longer operative time than open surgery, but the time of operation will be shortened as the surgeon becomes familiar with the procedure.

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小児異所性尿管瘤に対して施行した後腹膜鏡下半腎摘出術の1例

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5歳, 女児. 1歳2カ月より尿路感染症を繰り返す, 右異所性尿管瘤と診断され保存的に経過観察されていた. IVP, DMSA 腎シンチで瘤所属右上半腎は無機能で下半腎に国際分類Ⅲ度の膀胱尿管逆流症を認めた. 1998年8月13日, 右後腹膜鏡下半腎摘出術および瘤切除, 右下半腎逆流防止術を施行した. 術後経過

は良好で, 術後3カ月目のVCGでも逆流は消失し, 腎機能も良好であった. 小児における腹腔鏡下半腎摘出術は現在までに15例の報告があるが, 後腹膜アプローチは本症例が初めてである.

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