

# Laparoscopic removal of a pelvic cyst associated with obstructed megaureter and dysplastic renal remnant

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## Abstract

We report a case of a 41-year-old man with a solitary functioning left kidney and history of chronic pelvic discomfort associated with lower urinary tract symptoms. Imaging revealed a large cystic structure in the pelvis attached to a dilated tortuous ureter on the right with congenital absence of the right kidney. The patient underwent laparoscopic removal of the pelvic cyst and dilated right ureter. Pathological assessment revealed mesonephric remnants representing dysplastic renal tissue attached to a dilated and obstructed megaureter, extending into the bladder wall and forming a large pelvic cyst. The patient's symptoms resolved. A laparoscopic approach represents an excellent surgical option for pelvic pathology.

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## Résumé

Nous décrivons le cas d'un homme de 41 ans porteur d'un seul rein fonctionnel (gauche) et ayant des antécédents de douleurs pelviennes chroniques liées à des symptômes affectant les voies urinaires inférieures. Les épreuves d'imagerie ont révélé une masse kystique volumineuse au niveau du pelvis, une dilatation et une sinuosité urétérales du côté droit et l'absence congénitale de rein droit. Le patient a subi une ablation par laparoscopie du kyste pelvien et de la section dilatée de l'uretère droit. L'évaluation pathologique a révélé des vestiges mésonéphriques constitués de tissu rénal dysplasique lié à un méga-uretère obstrué avec dilatation kystique se prolongeant dans la paroi vésicale et formant ainsi un kyste pelvien volumineux. Les symptômes du patient ont disparu. Une approche laparoscopique représente une excellente option chirurgicale en présence de pathologie pelvienne.

## Introduction

A dysplastic kidney associated with a primary obstructed megaureter is an unsuspected finding during radiological evaluation of adult patients with chronic, nonspecific pelvic discomfort. Renal dysplasia is a histological diagnosis made by the presence of embryonic mesenchyme and primitive renal components. Two types of dysplasia exist, one in which

alterations in a genetic pathway important for nephron or collecting duct formation lead to abnormal development, occasionally with cyst formation, and the second caused by obstruction.<sup>1-3</sup> Obstructive conditions associated with renal dysplasia include primary obstructive megaureter and ureteropelvic junction obstruction.<sup>4,5</sup>

Laparoscopic nephrectomy and nephroureterectomy for dysplastic kidneys are now becoming widely accepted procedures for the pediatric population,<sup>6-9</sup> but are uncommon for the adult population. We report a case involving the laparoscopic removal of a dysplastic kidney with a primary obstructed megaureter associated with a symptomatic large pelvic cyst.

## Case report

A 41-year-old man presented with a several-year history of chronic, nonspecific symptoms in his pelvis and lower back. The patient also complained of urinary frequency (15–20 times/d) and urgency. The symptoms had been progressing during the previous 2 years. There was no history of urinary tract infections or prostatitis. The patient did not respond to  $\alpha$ -blockers, antibiotics or antispasmodic therapy. The patient was known to have a solitary left kidney. Physical examination revealed a benign abdomen with a normal penis and normal testicles and spermatic cords. Digital rectal examination revealed an increased sphincter tone and empty rectum. The prostate was mildly enlarged with a distinct area of induration noted on the right posterolateral aspect of the gland. The serum prostate-specific antigen level was 1.2  $\mu\text{g/L}$  with a negative urine culture.

Ultrasonography of the abdomen and pelvis revealed a solitary left kidney with compensatory hypertrophy. A large cystic structure measuring 8  $\times$  5 cm, posterior to the bladder and slightly off midline toward the right was identified (Fig. 1). The mass did not change after voiding and did not appear to have direct communication with any pelvic structure.

Computed tomography (CT) of the abdomen and pelvis revealed a 7.9  $\times$  7.2-cm mass posterior to the bladder, which

impressed on the posterior aspect of the bladder (Fig. 2). The mass appeared to be above the prostate gland with no fat plane between the mass and prostate. The mass had 31 Hounsfield units, which suggested that it did not represent a simple cyst. Extending from the mass was an elongated tubular structure that extended up the expected course of the right ureter to the level of the renal vein, where it disappeared abruptly after tapering. On the delayed images no contrast was seen within the mass or in the tubular structure (Fig. 3). The left kidney was normal.

The differential diagnosis of the pelvic mass based on radiological imaging included a dilated

distal right ureter with resultant congenital absence of the right kidney due to obstruction. Also included in the differential diagnosis were mullerian duct cyst, utricular cyst, seminal vesicle cyst or cystic neoplasm of the prostate.

Owing to his persistent pelvic pain, the patient elected for laparoscopic removal of the large pelvic cyst. An infrared fiberoptic ureteric stent was placed into the left ureter by cystoscopy before starting the laparoscopic procedure. No right ureteric orifice was identified by cystoscopy. The laparoscopic procedure involved the use of 4 ports (Fig. 4). The ports included an optical port placed at the level of the umbilicus, two 5-mm ports placed on the left side between the anterior



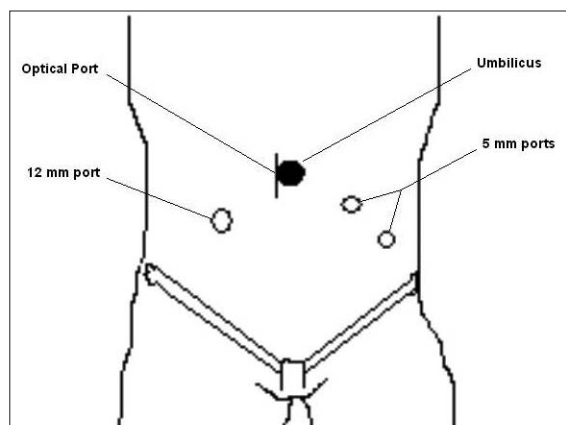
**Fig. 1.** Ultrasound of the abdomen and pelvis demonstrating a large cystic structure measuring 8 × 5 cm, posterior to the bladder and slightly off the midline toward the right.



**Fig. 2.** Computed tomography scan of the abdomen and pelvis demonstrating a 7.9 × 7.2-cm mass posterior to the bladder, impressing on the posterior aspect of the bladder.



**Fig. 3.** Computed tomography scan of the abdomen and pelvis with delayed images demonstrating no contrast within the mass or in the tubular structure. The left kidney excreted contrast normally and the bladder filled with contrast.



**Fig. 4.** Diagram illustrating port placement used for this procedure.

superior iliac spine and the umbilicus, and one 12-mm port placed on the right side between the anterior superior iliac spine and the umbilicus. During the procedure a large cystic structure was identified extending from the level of the right common iliacs down to the pelvis. There appeared to be some remnants of renal tissue with a renal artery and vein. The renal vessels were dissected and clipped. The specimen was then dissected into the region of the pelvis where there appeared to be a large tortuous ureter. The ureter was attached to a very large pelvic cyst occupying the entire retrovesical space. The large cyst was dissected circumferentially with care taken to preserve the left ureter. The seminal vesicles and ampulla of vas deferens were identified bilaterally as normal and left in situ. The large cyst also appeared to attach to the posterior aspect of the bladder wall. A small opening was made in the bladder. An opening was also made in the cyst wall and about 200 mL of fluid was drained. The cyst was excised and the portion on the posterior aspect of the bladder wall was fully cauterized. A ureteral orifice was not identified. The bladder defect was then closed laparoscopically in 2 layers with 2.0 Vicryl (Ethicon). The fiberoptic stent was removed.

Pathological assessment revealed mesonephric remnants representing dysplastic renal tissue attached to a cystically dilated and obstructed right ureter, extending into the bladder wall and forming a large pelvic cyst. No definite glomeruli, proximal or distal tubules were seen. No malignancy was present.

The patient was discharged home on the second postoperative day. He reported a substantial reduction in his pelvic pain before discharge. At last follow-up, the patient was 7 months post-surgery with negative results on CT, and no longer complained of pelvic pain with no bother in his lower urinary tract symptoms.

## Discussion

A dysplastic kidney associated with a primary obstructed megaureter is an uncommon finding during radiological evaluation of adult patients with chronic pelvic discomfort. In a dysplastic kidney, metanephric development begins to take place, but formation into normal nephrons and collecting ducts may come to a halt at a time when

a particular gene or genetic pathway malfunctions. Common histological features of dysplastic kidneys include distortion of renal architecture, immature or primitive glomeruli, nephron precursors such as comma- and S-shaped bodies, and cartilage and tubules encircled by collars of fibromuscular cells referred to as primitive ducts.<sup>4,5</sup> Primitive ducts are considered to be the hallmark finding of all dysplasia.<sup>10</sup>

Dysplastic kidneys most often occur in conjunction with ectopic ureteral orifices, with the extent of dysplasia correlating with the degree of ectopia. However, dysplastic kidneys may be seen in a few patients with normal ureteral orifices. In such cases, obstruction may or may not be present.<sup>1-3</sup> Obstructive conditions associated with renal dysplasia include primary obstructive megaureter and ureteropelvic junction obstruction. These conditions are usually associated with normally situated ureteral orifices and kidneys that have suffered diffuse damage because of hydronephrosis.<sup>4,5</sup>

Laparoscopic nephrectomy and nephroureterectomy for dysplastic kidneys are now becoming widely accepted procedures for the pediatric population.<sup>6-9</sup> Laparoscopic surgery can reliably confirm the diagnosis, locate the dysplastic kidney and ectopic ureter, and allow their removal simultaneously, safely and effectively. In addition, the laparoscopic approach has allowed a reduction in patient morbidity, hospital stay and analgesia requirement.

Laparoscopic removal of dysplastic kidneys in the adult population is uncommon. Several cases involving laparoscopic removal of dysplastic kidneys are reported in the literature. Buogo and colleagues<sup>11</sup> reported a case of a 23-year-old man who underwent laparoscopic removal of a symptomatic seminal vesicle cyst associated with an ectopic ureter and dysplastic renal remnant. The patient was discharged home on postoperative day 2. Cherullo and coauthors<sup>12</sup> reported a case of a 35-year-old man who underwent en bloc excision of a symptomatic seminal vesicle cyst with ureteral remnant and dysplastic renal tissue. The patient remained symptom-free after 3 years of follow-up. Sriprasad and colleagues<sup>13</sup> reported a case of a 31-year-old woman who underwent laparoscopic removal of a symptomatic, nonfunctioning multicystic dysplastic pelvic kidney. The patient resumed normal daily activities within 2 weeks of surgery. Challacombe and colleagues<sup>14</sup> reported a case of

a 29-year-old incontinent woman who underwent laparoscopic nephroureterectomy for a functioning dysplastic ectopic pelvic kidney with a tortuous dilated ureter draining into the vagina. The patient was rendered continent following the procedure.

The work up of patients who present with chronic, nonspecific pelvic pain should include history; physical examination; laboratory investigations, including routine urine microscopy, urine and semen culture and analysis of prostatic secretions; as well as various imaging studies. Abdominopelvic and transrectal ultrasonography are the most useful initial diagnostic tools for long-standing pelvic pain and other suspicious historical or physical findings.<sup>15</sup> Computed tomography can subsequently be performed to evaluate concurrent renal abnormalities and further define any pathological pelvic process.<sup>12</sup> Excretory urography, magnetic resonance imaging or seminovesiculography are additional studies which may be used to help differentiate between seminal vesicle cysts, other mullerian or wolffian duct cysts, seminal vesicle or rectal carcinoma, leiomyoma, liposarcoma or an abscess in the cul-de-sac.<sup>12</sup> Cystoscopy may reveal an absent ipsilateral hemitrigone or intravesical cyst protrusion.<sup>12</sup> Concurrent bladder pathology must be ruled out in any patient presenting with storage symptoms or hematuria.

Treatment for patients who present with pelvic cysts is reserved for symptomatic cases only. Incidentally discovered pelvic cysts that do not cause pain or functional impairment should be followed up without intervention. Treatment options for symptomatic cases include transrectal aspiration, transurethral unroofing and open or laparoscopic en bloc excision of the cyst, ipsilateral ureter and dysplastic renal tissue when present.<sup>12</sup> Simple cyst drainage is associated with recurrence, return of symptoms and infection.<sup>15</sup> Open surgery may be associated with significant postoperative morbidity.<sup>16</sup>

## Conclusion

Laparoscopic nephroureterectomy for dysplastic kidneys in the adult population is uncommon. In our case, laparoscopy provided excellent visualization of both the retroperitoneal and retrovesical

space allowing effective resection of the large pelvic cyst, ureter and renal remnant with minimal blood loss and patient morbidity. We believe that the laparoscopic approach represents the treatment of choice for such cases.

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