


## Case Report

# Ureteral reimplantation for the management of pelvic lipomatosis

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### Abbreviations & Acronyms

BOO = bladder outlet obstruction  
 CTU = CT urography  
 IPSS = International Prostate Symptom Score  
 LUTS = lower urinary tract symptoms  
 PL = pelvic lipomatosis  
 UR = ureteral reimplantation  
 UTI = urinary tract infection

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**How to cite this article:** Zong D, Xu X, Yan K *et al.* Ureteral reimplantation for the management of pelvic lipomatosis. *IJU Case Rep.* 2024; 7: 181–184.

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Received 14 December 2023; accepted 18 January 2024.  
 Online publication 1 February 2024

**Introduction:** Pelvic lipomatosis is a rare benign disease characterized by urethral elongation, bladder deformity, and/or hydronephrosis. Conservative management is not effective, and urinary diversion is the most effective treatment option but is usually unacceptable for relatively young patients. Ureteral reimplantation seemed to be an appropriate modality under these conditions. We present one case in which pelvic lipomatosis was managed with ureteral reimplantation.

**Patient presentation:** A 45-year-old, previously healthy man presented with right flank pain. Pelvic CT and CT urography showed excessive pelvic fat, bilateral hydronephrosis, tortuous ureters, and a pear-shaped bladder, all of which indicated a diagnosis of pelvic lipomatosis. We performed laparoscopic bilateral urinary tract infection on this patient. At follow-up, bilateral hydronephrosis and flank pain were greatly relieved.

**Conclusion:** Pelvic lipomatosis can be managed safely and effectively by urinary tract infection, but longer follow-up periods are needed to evaluate the long-term efficacy of this approach.

**Key words:** hydronephrosis, pelvic lipomatosis, ureteral reimplantation.

## Keynote message

Pelvic lipomatosis is a rare benign disease than could cause hydronephrosis and impair renal function. Ureteral reimplantation is the most effective treatment preserving the quality of life for patients with pelvic lipomatosis, but at the same time it is challenging for surgeons to perform ureteral reimplantation for this kind of patients. Here we present one case of pelvic lipomatosis managed by ureteral reimplantation with good short-term results (15 months after surgery).

## Introduction

PL is a proliferative disease that occurs mostly in males and is characteristic by overgrowth of normal fat in the pelvis, leading to urethral elongation, bladder deformity, and/or hydronephrosis. The etiology of PL was unclear, and 75% of cases were associated with proliferative cystitis.<sup>1</sup> Very few sporadic cases have been reported since the first description in 1959.<sup>2</sup> Conservative management was not effective, and urinary diversion was the most effective but was usually unacceptable for relatively young patients with benign disease. UR seemed to be an appropriate modality under these conditions.

## Case presentation

A 45-year-old, previously healthy man with a BMI of 24.2 presented with right flank pain but without LUTS. Urine microscopy was negative for leukocytes or red blood cells. Urine cytology were negative. Routine blood tests were normal. Pelvic CT showed excessive pelvic fat, and CTU revealed bilateral hydronephrosis, tortuous ureters with stenosis at the ends and a pear-shaped bladder, all of which indicated a diagnosis of PL (Fig. 1a,b). When the patient was lying in bed, the mass on the lower abdominal was conspicuous even when the bladder was empty (Fig. S1). We performed cystoscopy and found that the urethra was obviously elongated and that the bilateral ureteral orifices were unidentifiable; however, there was no obvious proliferative cystitis in the bladder (Video S1). We performed laparoscopic bilateral UR on this



**Fig. 1** (a–b) Preoperative pelvic CT showed excessive pelvic fat, and CTU revealed bilateral hydronephrosis, tortuous ureters with stenosis at the ends, and a pear-shaped bladder. (c–d) At the first follow-up (15 months after surgery), the bilateral hydronephrosis was greatly relieved.

patient. The bladder was covered with thick, hard and easily bleeding fat, and the ureters were also embedded in the purulent retroperitoneal fat, making identifying them challenging. Because the bladder had been dislocated upward, we did not free much of the terminal ureters; instead, we “straightened” the proximal ureter but made every effort to preserve the blood supply. We removed most of the fat covering the side walls of the bladder and everted the bladder mucosa to make the UR feasible (Fig. 2). We hypothesized that fat might regrow and compress the ureter, so we made the ureter-bladder anastomosis to be wide enough. The operating time was 210 min and the estimated blood loss was 100 mL. The convalescence was uneventful, and the creatinine level was within the normal range both before and after surgery. The hospital stay was 10 days, and the ureteral stents were pulled out 3 months after surgery. CTU (15 months after surgery) showed the bilateral hydronephrosis were greatly relieved (Fig. 1c,d).

## Discussion

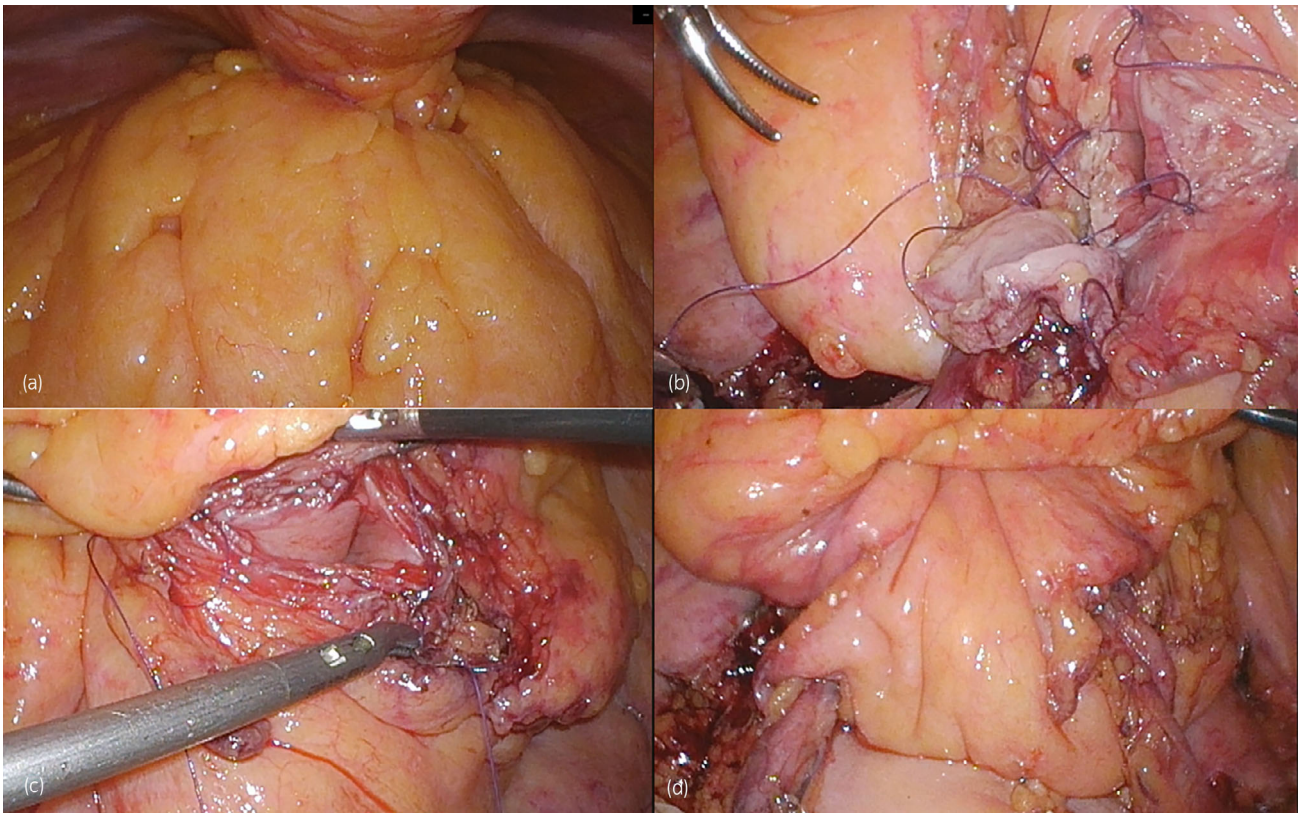
The symptoms of PL regarding the urinary tract were nonspecific and included LUTS and abdominal/flank pain.<sup>1</sup> Some authors believe that although most patients with PL had

elongation and anterior displacement of the urethra and up to 75% of patients have evidence of proliferative cystitis, they do not necessarily show evidence of LUTS or BOO.<sup>1,3,4</sup> Others reported a fairly high incidence of BOO among PL patients (up to 80%) with proliferative cystitis and reported that urodynamic-proven BOO was associated with bladder neck compression and the severity of glandular cystitis and predicted disease progression.<sup>5,6</sup>

The etiology of PL is unclear, and certain studies suggest that PL is possibly related to obesity and high blood pressure. Although some patients showed some degree of obesity, only a few were grossly obese, and the causal relationship between HBP and PL could not be ascertained.<sup>1,3,6</sup> The reason for the high incidence of proliferative cystitis in PL remained unclear, UTI and lymphatic and venous stasis had been implicated with controversy.<sup>1,7,8</sup> It has been postulated that proliferative cystitis, especially cystitis glandularis, may be a premalignant lesion of bladder adenocarcinoma,<sup>9</sup> but such an association has been refuted more recently.<sup>10,11</sup>

PL is mostly diagnosed radiologically. Pelvic CT reveals excessive pelvic fat, straightening, and elongation of the rectosigmoid and ureteral obstruction.<sup>4</sup> A pear-shaped bladder on IVU/CTU was the most valuable feature for identifying





**Fig. 2** (a) Bladder was covered with thick, hard and easily bleeding fat, and the ureters were also embedded in the purulent retroperitoneal fat, making identifying them challenging. (b–c) We removed most of the fat covering the lateral base of the bladder and everted the bladder mucosa to make the UR feasible and it was important to preserve the blood supply of distal ureters and made the anastomoses of ureters to bladder wide enough in case that the fat might regrow to compress the anastomosis. We did not take any antireflux procedures when performing the anastomosis for this specific patient in case of ureteral obstruction. (d) After completion of bilateral anastomoses of ureters to bladder we excised the fat covering bladder side walls lateral to the anastomosis.

patients with a PL with high specificity but low sensitivity.<sup>3,6</sup> Differential diagnoses include pelvic **teratoma**, **retroperitoneal fibrosis**, pelvic lipoma, and **liposarcoma** based on imaging features.<sup>4,12</sup>

The management of PLs is mainly aimed at relieving hydronephrosis and preserving renal function. Previous studies have shown that conservative treatment is ineffective, and current treatment for PL favors surgical management. Ileum conduits or other cutaneous diversions are unacceptable for relatively young patients, and ureteral stents have the disadvantage of requiring repeated cystoscopy procedures. UR is gaining popularity since Halachmi *et al.* reported the first case in which pelvic fat excision, and UR were performed using an ultrasonic-assisted lipectomy device.<sup>13</sup> Ge *et al.* retrospectively analyzed the clinical data of eight patients with PLs who underwent laparoscopic pelvic fat resection and UR. All surgeries were successful without serious perioperative complications. Postoperative follow-up revealed varying degrees of relief of hydronephrosis as did the IPSS.<sup>14</sup> Sanjay *et al.* reported five cases of PL in which PL was managed with robotic-assisted laparoscopic pelvic fat extirpation and UR. With a follow-up of 1–3 years, there was no evidence of disease recurrence.<sup>15</sup> We present one patient with PL managed by laparoscopic pelvic fat excision and UR who achieved effective short-term results. However, considering

the relatively young age and long life expectancy of these patients, the follow-up time was short and the long-term outcome of UR was uncertain. Besides, there was no standard of the extent of pelvic fat excision, although most authors claimed excision of fat “around the ureter and bladder,” no radiologic evidence of the extent of pelvic fat excision were provided.<sup>14,15</sup> Two case reports showed proved radiologic evidence of extensive pelvic fat extirpation (lower placement and/or globular contour of the bladder),<sup>16,17</sup> but there were no following reports of the long-term results. Surgeons wish to extirpate enough pelvic fat to make room for the possible regrowth of the fat that might compress the anastomosis. But how much excised fat is enough is a question of debate and usually at the surgeon’s discretion. Pelvic fat extirpation for patients with PL is time and blood consuming,<sup>16</sup> although theoretically one can extirpate as much pelvic fat as possible, how much a patient with disease of unknown etiology like PL would benefit from this procedure is a question that need longer follow-up to answer.

## Conclusion

PLs can be managed safely and effectively by laparoscopic pelvic fat extirpation and UR but longer follow-up periods are needed to evaluate the long-term efficacy of this approach.

## Author contributions

Dapeng Zong: Writing – original draft. Xin Xu: Data curation. Kai Yan: Project administration. Nianbiao Xu: Software. Xingkang Jiang: Software. Guoping Xu: Data curation; methodology; visualization. Baojie Ma: Conceptualization; funding acquisition; investigation; supervision; writing – review and editing.

## Conflict of interest

The authors have no conflict of interest.

## Approval of the research protocol by an Institutional Reviewer Board

Not applicable.

## Informed consent

Informed consent has been obtained from the patient.

## Registry and the Registration No. of the study/trial

Not applicable.

## Funding information

This work was funded by grants from Jiangsu College of Nursing (No. SHKRB2303, SHKRD2308, SHKRD2309) and grant from Science and Technology Project of Tianjin Health Commission (No. ZC20119).

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## Supporting information

Additional Supporting Information may be found in the online version of this article at the publisher's web-site:

**Fig. S1.** When the patient was lying in the bed in the operating room, the mass on the lower abdominal was conspicuous even when the bladder was empty.

**Video S1.** The urethra was obviously elongated and that the bilateral ureteral orifices were unidentifiable; however, there was no obvious proliferative cystitis in the bladder.