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Laparoscopic vesicopsoas hitch for infiltrative ureteral endometriosis

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Objective: To report the technique and outcome of a laparoscopic vesicopsoas hitch used for the treatment of infiltrative ureteral endometriosis.

Design: Case report.

Setting: A tertiary care center.

Patient(s): A 36-year-old woman with infiltrative endometriosis of the ureter.

Intervention(s): A laparoscopic vesicopsoas hitch.

Main Outcome Measure(s): The return of normal ureteral function as measured by IV pyelography and ultrasonography.

Result(s): After partial ureteral resection, it was noted that a tension-free anastomosis to the bladder was not possible. Thus, a laparoscopic vesicopsoas hitch was performed.

Conclusion(s): A vesicopsoas hitch can be performed successfully by laparoscopy. (Fertil Steril® 1999;71: 376–9. ©1999 by American Society for Reproductive Medicine.)

Key Words: Laparoscopy, vesicopsoas hitch, endometriosis, ureter resection, hydronephrosis, hydroureter, pelvic pain

The urinary tract is affected in about 2% of women with endometriosis. Infiltration of the ureter with endometriotic lesions eventually can lead to compression and obstruction. The progression can occur without any specific symptoms, and when left untreated can result in compromised renal function secondary to hydronephrosis. The ureter is affected by endometriosis most commonly in its distal third. After segmental resection of the diseased section of the ureter, ureterostomy or ureteroneocystostomy can be performed depending on the location and remaining length of the resected ureter. The principles of urologic surgery on the ureter apply to patients with endometriosis.

The anastomosis of the ureter to the bladder must be free of tension, which can be accomplished if there is sufficient length and mobility of the remaining healthy ureter. Otherwise, a vesicopsoas hitch or Boari flap may be necessary (1).

Operative laparoscopy provides the surgeon with magnified vision, superior exposure, and the ability to finely identify and dissect diseased areas in the pelvis, retroperitoneal space, and lower urinary tract. Severe endometriosis and adhesions can be treated effectively by laparoscopy with less morbidity for the patient, and a successful laparoscopic ureterostomy or ureteroneocystostomy can be performed (2–4).

We describe the first case of a laparoscopic vesicopsoas hitch performed to treat recurrent infiltrative endometriosis of the ureter after other conservative and surgical attempts to correct the problem failed.

CASE REPORT

A 36-year-old nulligravida with a history of revised American Fertility Society stage IV endometriosis and ureteral stenosis presented with recurrence of disease. Six months before presentation, we had treated her extensive pelvic endometriosis by laparoscopy, at which time we noted stenosis of the left distal ureter by an endometriotic lesion leading to a hydroureter. At that time, cystoscopic examination revealed minimal flow of urine from the left ureter. We performed an extensive adhesi-

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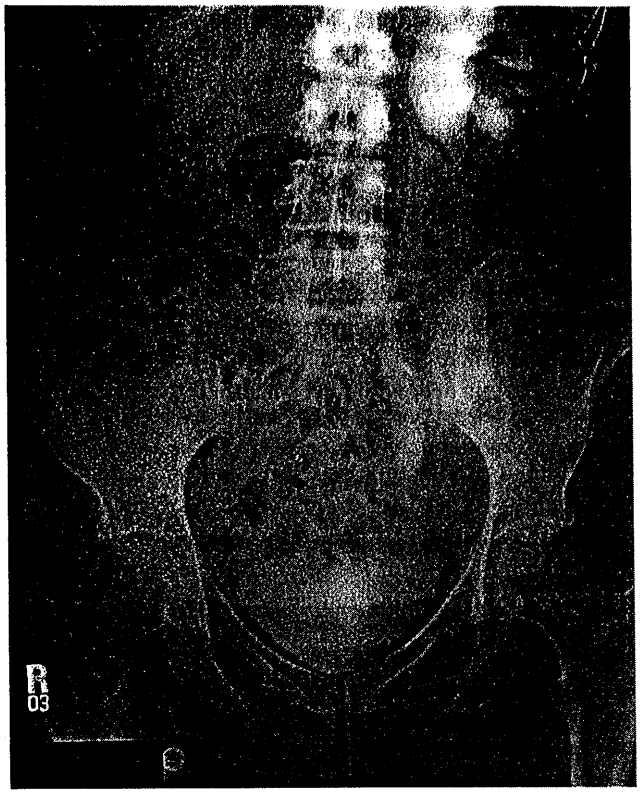
FIGURE 1

Preoperative IV pyelogram showing the left hydroureter and hydronephrosis.



olysis and treatment of endometriosis of the pelvis, including the bladder, bowel, ovaries, and fibrotic areas surrounding the ureter.

The endometriotic lesion surrounding the left distal ureter, however, was too extensive to be managed immediately, and the decision was made that further planning and preparation were required for more thorough treatment (Fig. 1). The procedure was terminated with insertion of a left ureteral stent. Postoperatively, the patient was extensively counseled with regard to the intraoperative findings, her postoperative options, and the possible complications related to each option.

Subsequently, she received danazol (200 mg four times daily) for 5 months in preparation for laparoscopic management of her ureteral endometriosis. At the second surgery, a partial ureteral resection and ureteroneocystostomy was performed by laparoscopy as described previously (3). Briefly, we mobilized the ureter with the use of hydrodissection and a CO_2 laser. It was noted that endometriosis had resulted in significant fibrosis surrounding a large portion of the distal left ureter. A 2-cm portion of the left ureter that appeared to be most involved was resected and a tension-free ureteroneocystostomy was performed at the bladder dome over a guidewire with the use of 4-0 polydiaxonone sutures at the 12-, 3-, 6-, and 9-o'clock positions (3). A double-J (8F) stent via cystoscopy revealed free flow of intravenously injected indigo carmine through the ureteral orifice at the end of the procedure.

Two months after the second surgery, the double-J stent was removed. Within weeks, the patient complained of severe colicky, left-sided pain. Ultrasonography revealed a left pelvocaliectasis and hydroureter located 2 cm above the bladder. A 2 × 2.2 × 4.3–cm hypoechoic lesion (endometrioma vs. hematoma) was noted anterior to, but not obstructing, the ureter.

An IV ureterogram confirmed these findings and also revealed a 2-cm distal ureteral stricture extending down to the site of the vesicoureteral anastomosis. Serum chemistry revealed a slight elevation of the creatinine level to 1.1 mg/dL from a baseline level of 0.7 mg/dL. The patient underwent placement of a left percutaneous nephrostomy and a double J-ureteral stent, which resulted in decompression of the hydronephrotic left kidney and free flow of contrast medium around the stent. Subsequently, she had a balloon dilatation of the ureteral stricture under fluoroscopic guidance, without success.

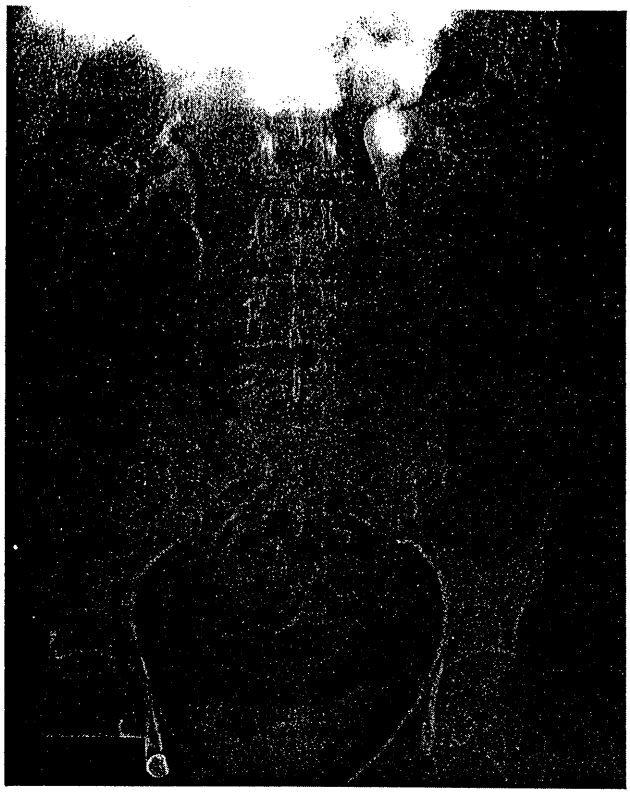
A repeat ureteral resection, ureteroneocystostomy, and possible vesicopsoas hitch was discussed with the patient, based on the likelihood that her ureter would not have sufficient length and mobility to permit the construction of a tension-free anastomosis a second time. She was given the choice of undergoing traditional laparotomy or a trial of laparoscopic management. We discussed with her the fact that the laparoscopic vesicopsoas hitch is a new approach, and that although a laparoscopic route would follow the same surgical principles as a laparotomy, conversion to a laparotomy might be necessary. We also discussed all potential risks, including the future recurrence of stenosis with either approach, and the patient signed a surgical consent form for segmental resection of the distal left ureter, possible neocystostomy, and the possible performance of a vesicopsoas hitch.

The surgical technique used was principally the same as for a laparotomy, and investigational review board approval was not necessary. We obtained access to the abdominal cavity in the usual fashion for gynecologic laparoscopic procedures. Pelvic inspection revealed recurrent dense pelvic adhesions and scarring involving the ovary, fallopian tube, and left ovarian fossa as well as rectosigmoid tethered to the left ovary, pelvic sidewall, and uterosacral ligaments. After extensive lysis of adhesions, including enterolysis and ureterolysis, and restoration of the anatomy, we identified a 2-cm stricture of the left ureter above the uterosacral ligaments causing a left hydroureter.

The ureter was completely freed of adhesions to the pelvic sidewall, left ovary, left uterosacral ligament, and

FIGURE 2

Postoperative IV pyelogram showing marked resolution of the left hydroureter and hydronephrosis.



sigmoid colon. The affected segment of the ureter was resected approximately 3 cm from the uterosacral ligament. The distal end was noted to be free of endometriosis and to have adequate blood supply. Despite complete mobilization of the ureter, the length of the ureter was not sufficient for the construction of a tension-free anastomosis to the bladder. Thus, a vesicopsoas hitch was performed laparoscopically as follows.

Retroperitoneal mobilization of the ureter was carried up to 4 cm above the pelvic brim. Next, a bladder flap was developed as for laparoscopic hysterectomy. And the space of Retzius was entered in the manner described for laparoscopic colposuspension procedures (4). In summary, using the obliterated umbilical ligaments as the landmark, anterior abdominal wall peritoneum was pulled down 5 cm above the symphysis pubis with graspers placed through the lateral ports. The tip of the suprapubic cannula was retracted into the space of Retzius and dissection of the space was carried down further inferiorly, to the point that the bladder could easily reach the left psoas muscle.

We placed three interrupted 1-0 delayed absorbable Polyglycon Vicryl laparoscopic sutures were placed (Ethicon, Somerville, NJ) through the bladder dome to the psoas tendon and secured them with the use of standard extracorporeal knots. Next, we made a fishmouth incision in the transected ureter with the use of laparoscopic scissors. Subsequently, we identified the site for neocystostomy with the aid of a cystoscope. With one operator shining the laparoscope light from the peritoneal cavity, and used the cystoscope to identify a location for cystotomy near the bladder dome. Cystotomy was then performed with CO_2 laser under cystoscopic guidance.

Then placed four interrupted, full-thickness, 4-0 polydioxanone sutures at the 3-, 6-, 9-, and 12-o'clock positions of the ureter to the dome of the bladder, incorporating all layers, namely the serosa, muscularis, and mucosa of the ureter and serosa and the muscularis and mucosa of the bladder, as described previously (3). Via the cystoscope, an outflow of intravenously injected indigo carmine through both ureteral orifices confirmed ureteral patency. The procedure was terminated with placement of the 8F double-J ureteral stent.

The total operative time was 190 minutes, approximately 110 minutes was used for extensive adhesiolysis and restoration of the anatomy. Estimated blood loss was <100 mL. The pathology report for the resected ureter revealed invasive endometriosis to the muscularis layer surrounded by severe fibrosis.

The patient had an unremarkable postoperative course and was discharged on postoperative day 2 without complications. An indwelling Foley catheter subsequently was removed on postoperative day 6. The double-J stent was removed 2 months after surgery. As of this writing, the patient had had 13 months of uncomplicated follow-up. An IV pyelogram performed at 12 months (Fig. 2) revealed resolution of the left-sided hydronephrosis, and the patient had a normal creatinine level (range, 0.7–0.9 mg/dL).

DISCUSSION

Significant morbidity may ensue when there is compression and obstruction of the ureter. Surgical treatment is indicated, which can be very challenging. Although operative laparoscopy offers the patient significantly reduced postoperative morbidity, we believe that the magnified view of the operative field through the laparoscope gives the surgeon better microsurgical capabilities.

To our knowledge, this is the first case report to describe a laparoscopic vesicopsoas hitch for the treatment of infiltrative ureteral endometriosis. The basic principle of the procedure follows that of the traditional approach by laparotomy, in which a thorough mobilization of a healthy segment of the ureter and bladder are essential. We incorporated techniques already well described and used for laparoscopic hysterectomy and bladder neck suspension for bladder mobilization. We conclude that, in skilled hands, the laparo-

scopic vesicopsoas hitch procedure can be a safe and effective alternative to the traditional laparotomy method.

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