Case Report

Laparoscopic Excision of Urachal Cysts in Elderly Men and woman Following Pregnancy

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Background and Objective: *Persistent urachus rarely presents in the aging male or during pregnancy. The authors report their experience with the laparoscopic excision of urachal cysts in two elderly men with significant co-morbidities and following pregnancy in a 32-year old female.*
Material and Method: *The two male patients (65 and 70 years old, respectively) presented with a lower abdominal mass and umbilical discharge, while persistent urachus was identified incidentally during pregnancy; patients were managed with laparoscopic excision at 4 weeks, 6 weeks, and one year after diagnosis, respectively. Using 3 port accesses, the urachus and medial umbilical ligament were clipped and divided. In 2 cases, specimens were separated from the bladder dome with a bladder cuff. In one patient, an additional port was required to facilitate intracorporeal freehand suturing of the bladder defect.*
Results: *All procedures were completed successfully via laparoscopy. No intraoperative or postoperative complications were reported. Operative time ranged from 120,180 and 160 minutes, respectively; in-hospital convalescence was 1, 7, and 6 days, respectively. Pathological evaluation revealed a benign urachal remnant in each case.*
Conclusion: *Laparoscopic excision of urachal cysts in the aging male or following pregnancy is safe and effective.*

Keywords: *Urachal cyst, Remnant, Laparoscopy, Surgery*

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The urachal ligament is an embryonic remnant connecting the dome of the bladder to the umbilicus via the ligamentum commune[1]. The tubular urachus normally involutes before birth, remaining as a fibrous band; however, its persistence may result in a variety of clinical manifestations not only in infants and children, but also in adults[2]. To the authors' knowledge, peer-reviewed literature pertaining to urachal cysts consists primarily of adult case reports. Small patient cohorts and retrospective analysis limit the evaluation of outcomes for laparoscopic excision of urachal remnants[3-7]. The authors report three cases of urachal cysts at our institutions, reviewing clinical presentation, evaluation imaging, and subsequent surgical management via laparoscopy. Furthermore, initial presentation during pregnancy and laparoscopic management of urachal cysts in aging men with significant co-morbidities has not been previously described in the literature.

The three patients presented for evaluation during the first 6 months of 2007. Following diagnosis of urachal cysts, one female and two males aged 32, 65 and 70 years old, respectively, underwent treatment with laparoscopic excision. Contrast-enhanced computed tomography (CT) and pre-operative cystourethroscopy

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confirmed non-communication between the bladder dome and the urachal remnant. Institutional Review Board approval from Mahidol University (MU) and the University of California San Francisco (UCSF) and informed patient consent allowed for data assessment. Patient demographics, intraoperative findings, pathologic data, and clinical outcomes were analyzed.

Case Report

Case 1

A 65-year old male presented at MU with a four day history of periumbilical pain and discharge. No urinary symptoms were noted, and history was otherwise noncontributory. Clinical urological examination was within normal limits, including urinalysis. Contrast enhanced CT of the abdomen and pelvis revealed a small, rim enhancing lesion underneath the umbilicus measuring 1.1 x 2.1 x 1.2 cm, suggestive of an infected urachal cyst. No vesicular involvement was noted. Cyst fluid contained Staphylococcus aureus. After percutaneous drainage and 6 weeks of antibiotic therapy, acute symptoms subsided and the patient underwent transperitoneal laparoscopic excision of the urachal remnant.

Under general anesthesia, the patient was placed supine in the 30-degree Trendelenburg position. A Foley urinary catheter and nasogastric tube were used. Radical excision of an urachal cyst was performed through 3 ports. After establishing pneumoperitoneum via the open Hasson technique, a 12-mm camera port was placed in the midline between the umbilicus and the end of xiphoid process. A 30-degree telescope was inserted. Under direct visualization after CO_2 insufflation, a 10-mm trocar was placed at the right lateral border of the rectus muscle and at the level of the umbilicus. A 5-mm trocar was then placed midway between the umbilicus and the right anterior superior iliac spine (Fig. 1). For diagnostic laparoscopy, a small urachal remnant was identified below the umbilicus.

Case 2

A 70-year old man was referred to MU due to a lower abdominal mass without umbilical discharge. No prior history was noted, and no voiding dysfunction was noted. Physical examination revealed a cystic mass between the umbilicus and suprapubic area that was non-tender to palpation. External genital and prostate examination was unremarkable. CT of the lower abdomen and pelvis revealed an oval-shaped

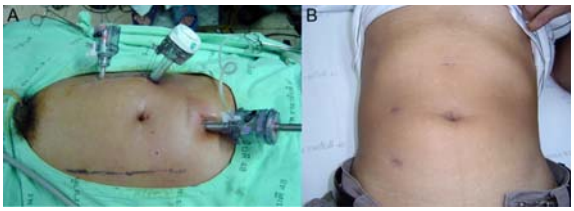

Fig. 1 For case 1: (A) Trocar placement for laparoscopic excision of urachal remnants. (1) A 12 mm trocar at the midline between the umbilicus and the end of xiphoid process. (2) A 10 mm trocar at the level of the umbilicus. (3) A 5 mm trocar at the right lateral rectus border inferior to the initial 10 mm trocar. The broken line represents the lateral border of rectus muscle. (B) A postoperative appearance after 4 months

Fig. 2 For case 2: contrast enhanced CT scan before laparoscopic excision of urachal cyst. At the level of bladder dome, an urachal cyst is identified along the anterosuperior aspect of the bladder and does not appear to involve other viscera (arrow)

hypodense cystic lesion measuring 4 x 3 x 3.3 cm at the anterior superior aspect of the urinary bladder (Fig. 2). Mild diffuse thickening of the urinary bladder wall was noted. The surgical technique including patient preparation and laparoscopic access technique was similar to case 1. Radical excision of urachal cyst was performed through 3 and one additional working port was placed laterally to the rectus muscle on the left side to facilitate intracorporeal freehand suturing. Definitive management consisted of laparoscopic excision of the urachal cyst with an accompanying bladder cuff.

For diagnostic laparoscopy, a cystic mass was found hanging from the anterior abdominal wall,

flanked by two medial umbilical ligaments and adhering to the dome of the bladder (Fig. 3).

Case 3

A 32-year old woman was incidentally identified with an asymptomatic urachal cyst during pregnancy by routine ultrasound performed at UCSF. The cyst, which was located at the superior-medial portion of the bladder dome, was followed for one year and remained unchanged in size (1.5 x 1.5 cm). The patient was secured in the modified flank position with the left side down and a 3 port access was used. For laparoscopic access technique, a Veress needle established pneumoperitoneum and an 11-mm camera port was positioned 3 cm above the umbilicus and lateral to the rectus muscle. Under direct visualization using a 30 degree telescope following CO_2 insufflation, two additional ports were placed laterally. These consisted of a 10/11 port superior and medial to anterior-superior iliac spine and a 10 mm port bisecting the two ports, placed in a slightly more lateral position.

For diagnostic laparoscopy, the urachal cyst was composed of two lobes, 1 cm for the larger aspect and 8 mm for the minor component. Uneventful laparoscopic excision of the urachal cyst with bladder cuff was performed.

In each of the cases, the urachal remnant was mobilized from a point just below the umbilicus, progressing towards the apex of the bladder. The bladder was then filled with saline via the urethral catheter, and the peritoneum was incised along a tissue plane above the bladder dome to the space of Retzius. For the first case, extirpation of the cyst proceeded easily. However, significant fibrotic attachments of the cysts to the bladder dome in cases 2 and 3 prevented easy separation. The bladder walls were violated and bladder cuffs resected as part of the surgical specimens using LigaSure scalpel devices (Valleylab, Boulder, CO, USA). Laparoscopic suturing was used to re-approximate the bladder defect with a 3-0 absorbable Vicryl suture two-layered closure. Watertight approximation was confirmed with 200 ml of normal saline bladder filling. Whole-specimen removal using a laparoscopic sac occurred through the 12 or 10 mm trocar sites. All port sites were closed in standard fashion.

All procedures were completed successfully laparoscopically and there were no perioperative complications noted. The operative durations were 120, 180 and 160 minutes, respectively; with minimal blood loss (50-100 ml). Duration of hospital stay was 1, 7, and 6 days respectively.

Fig. 3 For case 2: laparoscopic view showing the urachal cyst hanging down from the anterior abdominal wall between the apex of the bladder and umbilicus

Fig. 4 For case 2: surgical specimen from radical excision of the urachal remnant. The external surface consists of a previously opened oval cyst measuring 5 x 4 x 2 cm. The external surface is smooth, shiny, and brown colored in appearance. On bivalving, it contained soft, cheesy, yellow-tan material

Specimens were removed intact and histo-pathological assessment confirmed the diagnosis of benign urachal cyst elements without any unusual features. For the second case, the specimen consisted of a keratinized cyst (Fig. 4). Each patient was followed to 4 months, revealing no recurrences and well-healed, cosmetically acceptable incision sites.

Discussion

Traditional surgical management of benign urachal disease involves the radical excision of all anomalous tissue with or without a cuff of bladder tissue[7]. Laparoscopic removal has been proposed to be as effective and safe as the open technique with additional advantages of decreased hospital stay, analgesic requirement, and convalescence. Dissection is usually uncomplicated as most urachal cysts are not close to vital organs or major vessels[8]. All patients in the present review underwent laparoscopic excision of the urachal cysts without demonstrable morbidity. Current literature for laparoscopic excision in limited, as small numbers of adults undergo laparoscopic surgery since persistent urachus rarely presents in these age groups. The oldest adult undergoing laparoscopic excision previously reported in the literature was 66 years old[3,7,9-12].

The time to excision an urachal cysts were dependent on patient history. In the first case of an infected cyst, a two-stage approach with initial drainage and subsequent total excision was chosen to avoid unnecessary complications[13]. The 70 year old patient (Case 2) proceeded expediently to surgery due to advanced age and co-morbidities. For fertile women, the occurrence of urachal carcinoma is rare as peak incidence is between the fifth and sixth decade of age and the male/female ratio is 4:1[14]. However, Calsteren et al have reported a case of stage T_{4a} N_2 M_0 urachal carcinoma during early pregnancy[15]. In that case, positive pelvic lymph nodes and uterine involvement were present, necessitating surgical resection which included hysterectomy and termination of the pregnancy. These authors suggest that treatment options largely depend on the duration of the pregnancy, the tumor stage, and the patient's desire to continue the pregnancy. In the presented case, imaging studies did not demonstrate any pathognomonic signs for urachal carcinoma, including typical psammomatous calcifications which are visible in 50% to 70% of cases[16] or bladder wall involvement[17]. Delayed cyst excision in this case was preferred. It should be noted that evolving literature supports laparoscopic procedures for non-gynecological conditions in pregnancy and as the procedure of choice for surgical emergencies[18].

Although laparoscopic excision of urachal remnants appears to be the ideal management choice due to efficacy and patient tolerance, the primary difficulty remains choosing the most appropriate site of trocar placement[9,19]. A standard umbilical approach cannot be used because the urachus inserts into this structure. This difficulty was overcome by placing the trocars laterally. Cadeddu et al have previously described the three port technique, in which a camera port is placed in the midline above the umbilicus[3]. To reduce the risk of incomplete excision of the urachal remnant, Cutting et al introduced a novel placement scheme, as all three ports are located at the lateral margin of the rectus sheath, with the incision site below the umbilicus used to retrieve the surgical specimen[4]. In the present study, the authors used a technique described by Yohannes et al for initial port placement in the midline between the umbilicus and the end of the xiphoid process, providing better visualization of the whole urachal tract[19]. Moreover, the authors performed laparoscopic excision of the urachus with an attached bladder cuff for the second case, as a malignant lesion could not be ruled out and this maneuver decreased the risk of recurrence or development of carcinoma in unresected tissue. To close the bladder defect, the additional port placed along the left lateral rectus border at the umbilicus was required to facilitate intracorporeal freehand suturing.

In conclusion and with recent developments in minimally invasive surgery, a laparoscopic approach for removal of urachal remnants in the aging male with significant co-morbidities and following pregnancy is recommended because of its technical feasibility, safety, and cosmesis. The authors' experience suggests that laparoscopic excision of the urachal remnant may become the standard treatment of urachal cysts, although further studies are required due to limited data to date.

References

1. Siefker-Radtke A. Urachal carcinoma: surgical and chemotherapeutic options. Expert Rev Anticancer Ther 2006; 6: 1715-21.
2. Thapar RB, Jha VU, Mehta RU, Shah GR. Pyourachus: study of two cases. Br J Radiol 2006; 79: e1-4.
3. Cadeddu JA, Boyle KE, Fabrizio MD, Schulam PG, Kavoussi LR. Laparoscopic management of urachal cysts in adulthood. J Urol 2000; 164: 1526-8.
4. Cutting CW, Hindley RG, Poulsen J. Laparoscopic management of complicated urachal remnants. BJU Int 2005; 96: 1417-21.
5. Khurana S, Borzi PA. Laparoscopic management of complicated urachal disease in children. J Urol 2002; 168: 1526-8.
6. Linos D, Mitropoulos F, Patoulis J, Psomas M, Parasyris V. Laparoscopic removal of urachal

sinus. J Laparoendosc Adv Surg Tech A 1997; 7: 135-8.
7. Okegawa T, Odagane A, Nutahara K, Higashihara E. Laparoscopic management of urachal remnants in adulthood. Int J Urol 2006; 13: 1466-9.
8. Trondsen E, Reiertsen O, Rosseland AR. Laparoscopic excision of urachal sinus. Eur J Surg 1993; 159: 127-8.
9. Jorion JL. Laparoscopic removal of urachal cyst. J Urol 1994; 151: 1006-7.
10. Navarrete S, Sanchez IA, Sanchez SR, Sanchez R, Navarrete LS. Treatment of urachal anomalies: a minimally invasive surgery technique. JSLS 2005; 9: 422-5.
11. Siegel JF, Winfield HN, Valderrama E, Smith AD. Laparoscopic excision of urachal cyst. J Urol 1994; 151: 1631-3.
12. Stone NN, Garden RJ, Weber H. Laparoscopic excision of a urachal cyst. Urology 1995; 45: 161-4.
13. McCollum MO, Macneily AE, Blair GK. Surgical implications of urachal remnants: Presentation and management. J Pediatr Surg 2003; 38: 798-803.
14. von Garrelts B, Moberg A, Ohman U. Carcinoma of the urachus. Review of the literature and report of two cases. Scand J Urol Nephrol 1971; 5: 91-5.
15. Van Calsteren K, Van Mensel K, Joniau S, Oyen R, Hanssens M, Amant F, et al. Urachal carcinoma during pregnancy. Urology 2006; 67: 1290-21.
16. Mattelaer P, Wolff JM, Jung P, IJzerman W, Jakse G. Adenocarcinoma of the urachus: 3 case reports and a review of the literature. Acta Urol Belg 1997; 65: 63-7.
17. Thali-Schwab CM, Woodward PJ, Wagner BJ. Computed tomographic appearance of urachal adenocarcinomas: review of 25 cases. Eur Radiol 2005; 15: 79-84.
18. Klimek M, Wicherek L. Laparoscopic surgery during pregnancy as a standard procedure. Eur J Obstet Gynecol Reprod Biol 2007; 131: 102-3.
19. Yohannes P, Bruno T, Pathan M, Baltaro R. Laparoscopic radical excision of urachal sinus. J Endourol 2003; 17: 475-9.

การผ่าตัดผ่านกล้องเอาถุงน้ำชนิด urachal cysts ในผู้ป่วยชายสูงอายุและคนไข้หญิงหลังการคลอดบุตร

สมพล เพิ่มพงศ์โกศล, แอนโทนี แบลลา, สุชาดา สุธิเสวี, เจริญ ลีนานุพันธ์, มาแชล์ สโตเลอร์

ภูมิหลังและวัตถุประสงค์*: Persistent urachus พบน้อยมากในผู้ป่วยสูงอายุและระหว่างตั้งครรภ์ คณะผู้นิพนธ์รายงานประสบการณ์การผ่าตัดด้วยกล้องนำเอา urachal cyst ออกมาจากผู้ป่วยชายสูงอายุ ที่มีโรคประจำตัว และในคนไข้หญิงหลังจากการคลอดบุตรแล้ว*

วัสดุและวิธีการ*: ผู้ป่วยชายสูงอายุสองคนมาด้วยก้อนที่ท้องน้อยและมีน้ำออกจากสะดือตามลำดับ ส่วนผู้ป่วยหญิงตรวจพบระหว่างการตั้งครรภ์ คนไข้ได้รับการผ่าตัดในสัปดาห์ที่ 4, 6 และ 1 ปีหลังการวินิจฉัยตามลำดับ จากการใช้ทั้งหมดสามท่อแทงเจาะสามารถตัดเอา urachus และ medial umbilical ligament ออกมาได้ มีผู้ป่วย 2 คน ที่สามารถแยกชิ้นเนื้อได้จากกระเพาะปัสสาวะ อย่างไรก็ตามมีคนไข้ 1 คน ที่ต้องเพิ่มอีกหนึ่งท่อแทงเจาะเพื่อช่วยในการเย็บปิดกระเพาะปัสสาวะเนื่องจากชิ้นเนื้อติดกับกระเพาะปัสสาวะ*

ผลการศึกษา*: การผ่าตัดด้วยกล้องประสบความสำเร็จด้วยดี ไม่พบว่ามีโรคแทรกซ้อนในระหว่างผ่าตัด และหลังการผ่าตัด เวลาในการผ่าตัดอยู่ระหว่าง 120, 180 และ 160 นาที ตามลำดับ และพักอยู่ในโรงพยาบาล 1, 7 และ 6 วัน ตามลำดับ รายงานผลพยาธิวิทยาเป็นเนื้องอกไม่ร้ายแรง*

สรุป*: การผ่าตัดด้วยกล้องนำเอา urachal cyst ออกมาจากผู้ป่วยชายสูงอายุที่มีโรคประจำตัว และผู้ป่วยหญิงหลังจากการคลอดบุตรแล้วปลอดภัยและมีประสิทธิภาพ*