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Unexpected finding of urachal remnant cyst. Tips for laparoscopic approach

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ABSTRACT

INTRODUCTION: Incomplete obliteration of the urachal lumen could cause different types of anomalies and urachal cyst is the most common among these in the adult population. It is usually asymptomatic and may be an incidental finding during a surgical exploration for other reasons. However, it can be subject to complications.

PRESENTATION OF CASE: A 38-year-old female patient with history of worsening lower-quadrants abdominal pain, associated with fever and chills, presented to emergency room; clinical examination revealed a painful, tender, and fixed lump to the left inferior abdominal quadrant. Ultrasound revealed a left adnexal mass and, along the midline, between the adnexal mass, the bladder and the uterus, was evident a 3-cm unilocular cyst with regular walls and hypoechoic content. MRI confirmed the suspicion of a left tubo-ovarian abscess and suggested a diagnosis of urachal remnant for the smaller midline cyst. In this report, we describe the step-by-step laparoscopic management of the case, paying attention to “the tips and tricks” for urachal cyst excision.

DISCUSSION: The urachal cyst, which results from the accumulations of secretions in urachal remnant, presents as a single or multiple parietal abdominal mass, *per se* asymptomatic. However, this condition is not without risk and infection represents the most common complication. Ultrasound is very useful in the diagnostic phase. Today, the main approach has become laparoscopic excision, with particular attention to a radical removing of the mass, due to high recurrence rate and the risk of malignancy.

CONCLUSION: In our experience, laparoscopy represents an excellent diagnostic and therapeutic tool for urachal cyst, especially for patients with acute urgent conditions, doubtful clinical history, and no clear signs or symptoms.

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1. Introduction

The urachus is an embryologic remnant of allantois which communicates the apex of the bladder with the umbilicus during fetal growth, being compartmentalized by umbilico-vesical fascia, along with the medial umbilical ligament [1]. This structure starts to close at about the 25th week of gestation, with complete obliteration after birth. Incomplete obliteration of the urachal lumen could cause four types of anomalies: urachal cyst, congenital patent urachus, umbilical-urachal sinus, and vesical-urachal diverticulum [2]. The urachal cyst is the most common among these anomalies in the adult population, with an incidence of 1/5000 live births [3]. It is usually small and asymptomatic and may be an incidental finding

during a surgical exploration for other reasons. However, they can be subject to complications [4]. We report our experience on the laparoscopic management of a urachal cyst in a patient affected by an adnexal abscess, focusing on the diagnostic pathway and a step-by-step description of the procedure. The present case is reported in line with the SCARE criteria [5].

2. Case report

A 38-year-old, nulliparous woman presented to our Emergency room with a 7-days history of worsening lower-quadrants abdominal pain, associated with fever, and chills. Her medical history was unremarkable, with no previous abdominal surgery. She was feverish (38.7 °C) with a mild tachycardia (heart rate of 110 bpm), but hemodynamically stable. Clinical examination revealed a painful, tender, and fixed lump to the left inferior abdominal quadrant. Laboratory tests showed an elevated white blood cell count (WBC)

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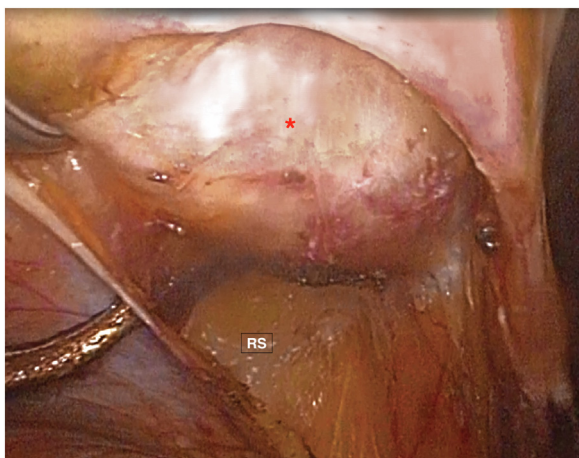


Fig. 1. MRI of a mass located at midline cranial to the bladder apex, of urachal cyst (with the arrow: urachal cyst; red star: tubo-ovarian abscess; U: uterus).

(15,000/ μ L) and serum C-reactive protein (CRP) (23.61 mg/L). Combined trans-abdominal and transvaginal ultrasound showed a painful left adnexal mass of 14 × 7 × 6.5 cm; it presented mixed content (hypochoic/isochoic), partial septa, thickened walls, and a negative color-doppler study. The cyst was adherent to the uterus and the anterior abdominal wall. At this level, along the midline, between the adnexal mass, the bladder, and the uterus, was evident a 3-cm unilocular cyst. It showed regular walls and hypochoic content, similar to that of the left mass. After discussion with the patient, we opted for preliminary medical management based on a presumed diagnosis of a tubo-ovarian abscess with a satellite cyst in a young nulliparous woman.

We ordered a magnetic resonance imaging (MRI). The T2-weighted sequence demonstrated a difference between the content and nature of the two abdominal cysts. MRI confirmed the suspicion of a left tubo-ovarian abscess and suggested a diagnosis of urachal remnant for the smaller midline cyst (Fig. 1). However, despite four days of broad-spectrum antibiotics, fever persisted, and inflammatory markers were raised (WBC 19,600/ μ L, CRP 84.23 mg/L). After a discussion with the patients about the risks and benefits of surgery regarding the removal of the left adnexa and the suspected urachal remnant, we decided for surgical exploration. Written informed consent was obtained from the patient prior to surgery.

Laparoscopy was performed under general endotracheal anesthesia with the patient in a dorsal lithotomy position. After induction of pneumoperitoneum with a Verres needle on Palmer's point, we placed a 10-mm trocar, at the level of the umbilicus (for the 0° optic), and 3 accessory 5-mm trocars [6–10].

On laparoscopic entry, a 15-cm left tubo-ovarian abscess, adherent to the abdominal wall, the small and the large bowel was evident. After cautious adhesiolysis, we excised the left adnexa with the abscess walls. Then, after lateral access to the Retzius space, a 3-cm pre-peritoneal cystic mass consistent with a cyst of the lower urachus was detected (Fig. 2). The dissection was carried out until the retropubic space and to expose the bladder dome. An eventual communication with the bladder was checked, considering that it is always present in the case of fistula and diverticulum. The bladder was distended using a 300 ml saline solution with methylene blue dye to allow better visualization of the bladder and exclude possible communications with urachal residues. The peritoneum was sectioned cranially to the cyst, and blunt dissection proceeded laterally. At the end of the dissection, the cyst was separated from the bladder dome, which was reinforced with a double-layer absorbable suture. Bladder distension with a 300 ml saline solution with methylene blue dye confirmed the absence of

leakage [11]. To reduce the risk of visceral adhesions, we closed the parietal peritoneum with a continuous suture. The specimens were sent for pathological examination. Fever and laboratory findings resolved after 2 days, and the postoperative course was uneventful. A Foley catheter was kept in place for three days and she was discharged on the third postoperative day in good clinical condition. Pathology findings were consistent with a tubo-ovarian abscess and a cystic urachal remnant.

3. Discussion

The structure of the urachus consist by three layers, an innermost epithelial layer with some potential secretory function, a connective tissue layer and an outermost muscular layer; this fibromuscular band usually becomes completely obliterated shortly after birth to form the median umbilical ligament, and lies between the peritoneum and the transversalis fascia [12].

The true incidence of urachal anomalies is unknown. However, it is noted as a rare pathology, most frequently identified in early childhood. It was estimated that the urachus persists in only 2% of adults, with possible complications or related symptoms [12,13]. The urachal cyst, which results from the accumulations of secretions (mucinous or serous) in urachal remnant, presents as a single or multiple parietal abdominal mass, *per se* asymptomatic. Diagnosis can be accidental in asymptomatic cases and it is suspected when a mass is visualized in the anterior abdominal wall or near the dome of bladder. This remnant cyst may be confused with a wide spectrum of midline abdominal disorders and consequently, a prompt diagnosis is generally difficult [14]. As showed in the reported case, coexisting pelvic pathologies could add several obstacles in understanding of the clinical picture. Moreover, this condition is not without risk and infection represents the most common complication, often producing unspecific symptoms (abdominal pain and tenderness, fever, erythema, purulent urinary discharge, dysuria), similar to those caused by other gynaecological conditions such as ovarian cysts or uterine myomas. Cystic rupture in the peritoneal cavity is a rare event, with possible dangerous complications for the inflammatory involvement of the adjacent intestine [13]. Furthermore, Ultrasound (US) is very useful in the diagnostic phase, considering its noninvasive and easy approach: this pathology has a good visibility using trans-abdominal US for its localization and the presence of free bowel gas in the pre-peritoneal space [15]. Sometimes, cystography, computed tomography and/or MRI can be added for confirmation of doubtful cases [16,17].

The traditional treatment of urachal remnant cysts is surgical excision, performed in the past by laparotomy. In 1993, Trondsen et al. reported the first laparoscopic excision of a urachal remnant [18] and, since then, there have been several other case reports of laparoscopic excisions of various types of urachal remnants in patients of various ages. Today, the main approach has become laparoscopic excision, with all the advantage of the minimal invasive surgery: minimal morbidity, shorter hospital stay and faster overall recovery [19,20].

Complete excision of the mass is suggested as the surgical strategy to choice. In fact, as reported in international literature, only the radicality of resection reduces the risk of recurrence [18]. Moreover, the risk of malignancy should be always be considered. Although urachal tumors are extremely rare, exceptional malignancy development (adenocarcinomas in 80% of cases) must be hypostasized when complications or local/system invasion occur; in this sense, drainage of the cystic content is considered inadequate.

Here, we described the radical excision of a cystic mass, involving the whole block of tissue within the vesical-umbilical fascia, urachus and the medial umbilical ligaments, performed by laparoscopy; in the description of the surgical procedure, we con-

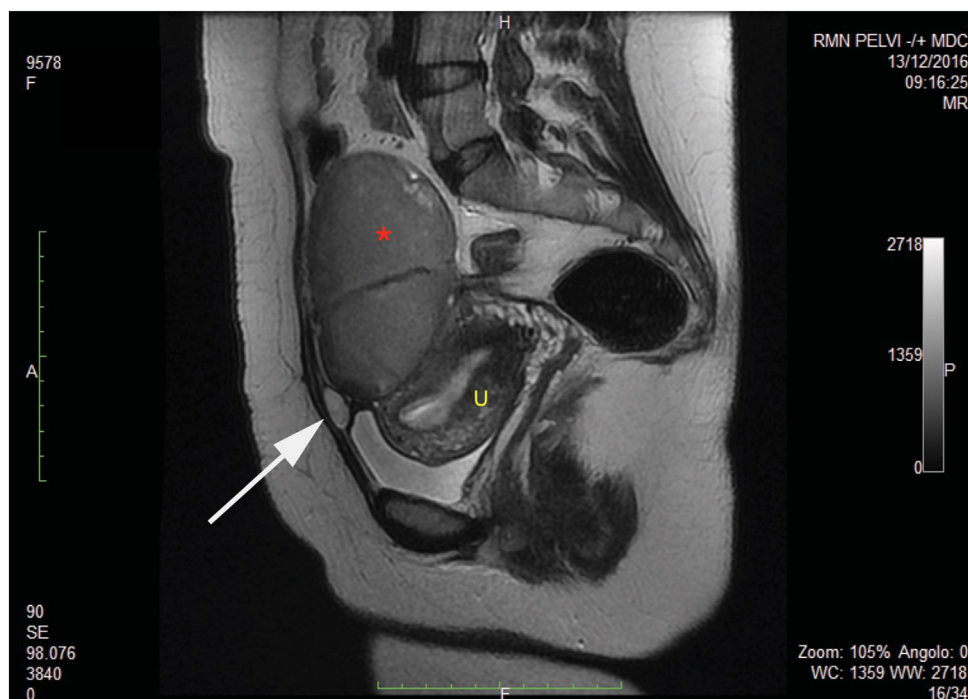


Fig. 2. Intra-operative image of urachal cyst (red star: urachal cyst; RS: Retzius space).

sidered very important the detailed explanation of all “surgical steps”. In particular, the “bladder phase” can be considered the most dangerous: in the case of partial cystectomy, it is necessary to perform precise gap closure, and the use of methylene blue filling, for intra-operative bladder control during dissection, can be recommended. Based on these considerations, the laparoscopic approach can be defined the first choice because of its minimally invasive nature, rapid patient convalescence, and excellent cosmetic results.

4. Conclusion

In our experience, laparoscopy represents an excellent diagnostic and therapeutic tool for urachal cyst, especially for patients with acute urgent conditions, doubtful clinical history, and no clear signs or symptoms. Diagnosis of abdominal wall cyst near the midline could be challenging and urachal remnants should be kept in mind. Considering the possibility of bladder involvement, however, the procedure should be performed by a skilled laparoscopic surgeon with suture ability.

Declaration of Competing Interest

All authors have no conflicts of interest to disclose

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Ethical approval

No specific ethical approval was necessary

Consent

Written informed consent was obtained from the patient for publication of this case report and accompanying images. A copy

of the written consent is available for review by the Editor-in-Chief of this journal on request.

Author contribution

Calagna G: study concept, data interpretation Cucinella G: study design, writing the paper Catinella V, Rotolo S: writing paper, data interpretation Maranto M, Carlisi B: data analysis Bisso C, Mangione D: data collection Venezia R: data interpretation.

Registration of research studies

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References

- [1] S.M. Berman, B.M. Tolia, E. Laor, R.E. Reid, S.P. Schweizerhof, S.Z. Freed, Urachal remnants in adults, *Urology* 31 (1988) 17–21.
- [2] T. Ueno, H. Hashimoto, H. Yokoyama, M. Ito, K. Kouda, H. Kanamaru, Urachal anomalies: ultrasonography and management, *J. Pediatr. Surg.* 38 (2003) 1203–1207.
- [3] H.G. Mesorbian, A. Zacharias, A.H. Balcom, R.D. Cohen, Ten years of experience with isolated urachal anomalies in children, *J. Urol.* 158 (1997) 1316–1318.
- [4] A.E. Macneily, N. Koleilat, H.G. Kiriuluta, Y.L. Homsy, Urachal abscesses: protean manifestations, their recognition and management, *Urology* 40 (1992) 530–532.
- [5] R.A. Agha, M.R. Borrelli, R. Farwana, K. Koshy, A.J. Fowler, D.P. Orgill, The SCARE 2018 statement: updating consensus surgical CAse REport (SCARE) guidelines, *Int. J. Surg.* 60 (2018) 132–136.
- [6] A. Agrusa, G. Romano, G. De Vita, G. Frazzetta, D. Chianetta, G. Di Buono, et al., Adrenal gunshot wound: laparoscopic approach. Report of a case, *Int. J. Surg. Case Rep.* 5 (2014) 70–72.
- [7] A. Agrusa, G. Romano, G. Di Buono, G. Frazzetta, D. Chianetta, V. Sorce, et al., Acute appendicitis and endometriosis: retrospective analysis in emergency setting, *GIOG* 35 (2013) 728–732.
- [8] A. Agrusa, G. Frazzetta, D. Chianetta, S. Di Giovanni, L. Gulotta, G. Di Buno, et al., Relaparoscopic management of surgical complications: the experience of an emergency center, *Surg. Endosc.* 30 (2016) 2804–2810.
- [9] G. Cucinella, S. Rotolo, G. Calagna, G. Adile, M. Manzone, A. Perino, G. Cucinella, Laparoscopic management of interstitial pregnancy: the purse-string technique, *Acta Obstet. Gynecol. Scand.* 91 (2012) 996–999.
- [10] G. Cucinella, G. Calagna, G. Romano, G. Di Buono, G. Gugliotta, S. Saitta, et al., Robotic versus laparoscopic sacrocolpopexy for apical prolapse: a case-control study, *G. Chir.* 37 (2016) 113–117.
- [11] G. Hammond, L. Yglesias, J.E. Davis, The urachus, its anatomy and associated fasciae, *Anat. Rec.* 80 (1941) 271–287.
- [12] J.M. Gleason, P.R. Bowlin, D.J. Bagli, A.J. Lorenzo, T. Hassouna, M.A. Koyle, et al., A comprehensive review of pediatric urachal anomalies and predictive analysis for adult urachal adenocarcinoma, *J. Urol.* 193 (2015) 632–636.
- [13] G. Cucinella, R. Granese, R. Venezia, D. Mangione, G. Calagna, A. Perino, Parasitic dermoid cyst coexisting with absence of an adnexa, *Acta Obstet. Gynecol. Scand.* 90 (2011) 677–678.
- [14] K.H. Yoo, S.J. Lee, S.G. Chang, Treatment of infected urachal cysts, *Yonsei Med. J.* 47 (2006) 423–427.
- [15] E.E. Widni, M.E. Höllwarth, E.Q. Haxhija, The impact of preoperative ultrasound on correct diagnosis of urachal remnants in children, *J. Pediatr. Surg.* 45 (2010) 1433–1437.
- [16] A. Perino, G. Calagna, G. Adile, B. Adile, S. Polito, G. Gugliotta, et al., Use of trans-labial ultrasound in the diagnosis of female urethral diverticula: a diagnostic option e strongly considered, *J. Obstet. Gynaecol. Res.* 4 (2015) 1108–1114.
- [17] M. Galia, D. Albano, A. Bruno, A. Agrusa, G. Romano, G. Di Buono, et al., Imaging features of solid renal masses, *Br. J. Radiol.* 90 (2017), 20170077.
- [18] E. Trondsen, O. Reiertsen, A.R. Rosseland, Laparoscopic excision of a urachal sinus, *Eur. J. Surg.* 159 (1993) 127–128.
- [19] T. Okegawa, A. Odagane, K. Nutahara, E. Higashihara, Laparoscopic management of urachal remnants in adulthood, *Int. J. Urol.* 13 (2006) 1466–1469.
- [20] S. Navarrete, A. Sanchez-Ismayel, R. Sanchez-Salas, M. Sanchez-Renata, S.L. Navarrete, Treatment of urachal anomalies: a minimally invasive surgery technique, *JSL* 9 (2005) 422–425.

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