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Tubo-ovarian abscess: A potential mimicker of urachal malignancy

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ABSTRACT

Urachal cancer is a rare but aggressive malignancy. A urachal mass concerning for adenocarcinoma was identified in a 32-year-old G2P1 female on 12-week ultrasound and confirmed on pelvic MRI. Due to progressive growth of the mass and refractory abdominal pain, a multi-disciplinary meeting was held, after which the patient chose to undergo an exploratory laparotomy. A tubo-ovarian abscess was identified involving the intestine, right ovary, fallopian tube, and communicating with a patent, necrotic urachus. This is the first reported case of a tubo-ovarian abscess masquerading as a urachal malignancy, which can present similarly with abdominal pain and irritative urinary symptoms.

1. Introduction

The urachus is a midline vestigial structure that connects the bladder dome to the umbilicus in adults and to the allantois during fetal development. In most cases, the urachus obliterates to become the median umbilical ligament during the second trimester. However, when a remnant of the urachus persists, this epithelial tissue has the potential to undergo malignant transformation. Urachal adenocarcinoma is rare, accounting for less than 1% of bladder cancers, yet highly aggressive with a 5-year survival rate of 45%.[1,2] Clinical presentation is non-specific but can include urinary frequency, dysuria, hematuria, and abdominal pain. Since this condition is most prevalent in older adult males, urachal malignancy in pregnancy has been rarely reported.[2] Here, we discuss the case of a first-trimester female patient with imaging findings most consistent with a urachal malignancy but with a final tissue diagnosis of a benign tubo-ovarian abscess.

2. Case presentation

A 32-year-old G2P1 female with a past medical history notable for low-grade squamous intraepithelial lesion (LSIL) on Pap smear with subsequent negative colposcopy and no sexually transmitted infections (STIs) was incidentally found to have a 4 to 5-cm area of heterogeneously thickened bladder wall on her 12-week obstetric ultrasound. There was also concern for intravesical papillary projections as well as increased bladder wall vascularity on Doppler. The patient had reported significant pelvic pain since conception as well as urinary frequency and urgency with a negative urinalysis (UA) at 9 weeks. A non-contrast pelvic MRI at 15 weeks confirmed the ultrasound findings and further showed a large urachal mass (5.0 × 4.1 × 7.6 cm) invading the rectus muscle and the bladder, most concerning for urachal adenocarcinoma (Fig. 1). The patient was hospitalized a few days later for progressively severe abdominal pain that was refractory to oral narcotics. Due to her worsening symptoms, she underwent transurethral resection of bladder tumor (TURBT) (Fig. 2). Pathology samples from this procedure showed polypoid cystitis and acute inflammation without evidence of malignancy. Ultrasound-guided core biopsies of the bladder and urachal mass taken two days post-TURBT were also negative for malignancy but demonstrated micro-abscess formation with reactive fibrosis.

Given a progressively painful, palpable abdominal mass with cystoscopic and percutaneous biopsies that were non-diagnostic for cancer, a multi-disciplinary team was assembled including urologic oncology, gynecologic oncology, maternal fetal medicine, and obstetric anesthesiology. The patient strongly desired excision of the mass due to intolerable pain with several months remaining prior to a possible viable birth. After discussing the risks and benefits of pregnancy termination followed by urachal excision versus urachal excision with the goal of continuing her pregnancy, the patient chose the latter. Despite her

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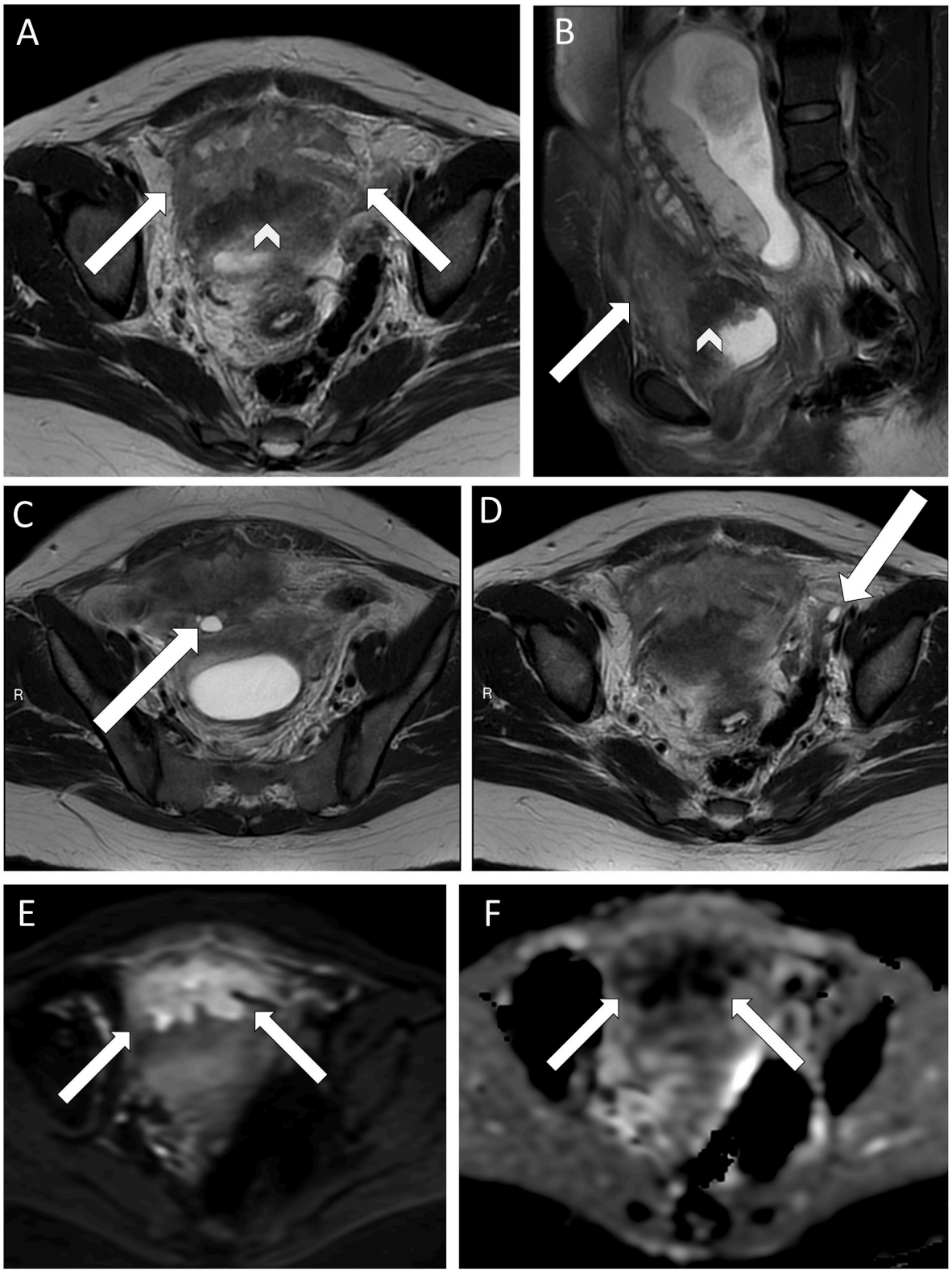

Fig. 1. Pelvic MRI without contrast at 15 weeks gestational age. Axial (A) and sagittal (B) T2 images demonstrate irregular mural bladder wall thickening with frond-like components intra-luminally (arrowhead). Contiguous intermediate signal soft tissue infiltration (arrows) extend anteriorly and superiorly in the space of Retzius, along the expected course of the urachus. Presumed right and left ovaries (arrows) appear normal (C,D). Marked diffusion restriction is seen on axial diffusion weighted imaging (E) and ADC (F) images, corresponding to the infiltrative space of Retzius soft tissue. This constellation of imaging findings was deemed highly suspicious for urachal adenocarcinoma.

benign biopsies, the patient understood there was still high suspicion of a urachal malignancy given her imaging findings and that a major operation could place her pregnancy at risk.

Thus at 18 weeks, the patient was taken to the operating room for an exploratory laparotomy. The urachus was dissected and found to be filled with necrotic inflammatory tissues with attachments to the right ovary and fallopian tube. This necrotic phlegmon was in direct communication with the cecum and appendix. Multiple frozen sections obtained intra-operatively all demonstrated an inflammatory, necrotic process. The patient then underwent an en bloc excision of the right ovary, fallopian tube, and urachus with an ileocolic resection (Fig. 3). Final pathology of the specimen was read as benign abscess with fat necrosis, fibrosis, granulation tissue, and noted the presence of colonies of filamentous organisms.

Despite initially doing well post-operatively, on day 3 after surgery, the patient was found to have pre-viable cervical dilation. She elected for induction and delivered a non-viable fetus at 18 weeks. On fetal autopsy, placental pathology was consistent with acute chorioamnionitis. The patient otherwise had no other complications during her hospitalization while on intravenous piperacillin-tazobactam, and she was discharged on post-operative day 7 with a 14-day course of doxycycline and metronidazole.

3. Discussion

In this female patient with severe pelvic pain dating to the beginning of her pregnancy, findings on ultrasound, MRI, and cystoscopy were most concerning for urachal adenocarcinoma, an uncommon cancer associated with poor survival outcomes.[1,2] Due to progressive symptoms and continued suspicion for a potential underlying malignancy, the patient underwent an exploratory laparotomy and urachal excision.

Pelvic inflammatory disease (PID) is an ascending infection most commonly caused by STIs, which can be associated with tubo-ovarian abscess. One of the challenges in PID is its diagnosis, which often occurs at the time of surgery as happened in this case. Clinical presentation can mimic other conditions with non-specific findings such as leukocytosis and abdominal pain. In pregnancy, PID is rare but can lead to severe consequences with a recent systematic review reporting a viable birth rate of 60.5% and 62.8% of women undergoing exploratory laparotomies.[3] The need for radical surgery and the unfortunate outcome of pregnancy loss in our patient may have likely resulted even if a tubo-ovarian abscess was suspected sooner and if her pain had been better controlled earlier in pregnancy.

On final pathology, colonies of filamentous organisms were identified in the mass. Interestingly, *Actinomyces,* a filamentous bacteria found in the female genitourinary tract, has been associated with tubo-ovarian abscess and PID in women with prior intrauterine device (IUD) use.[4]

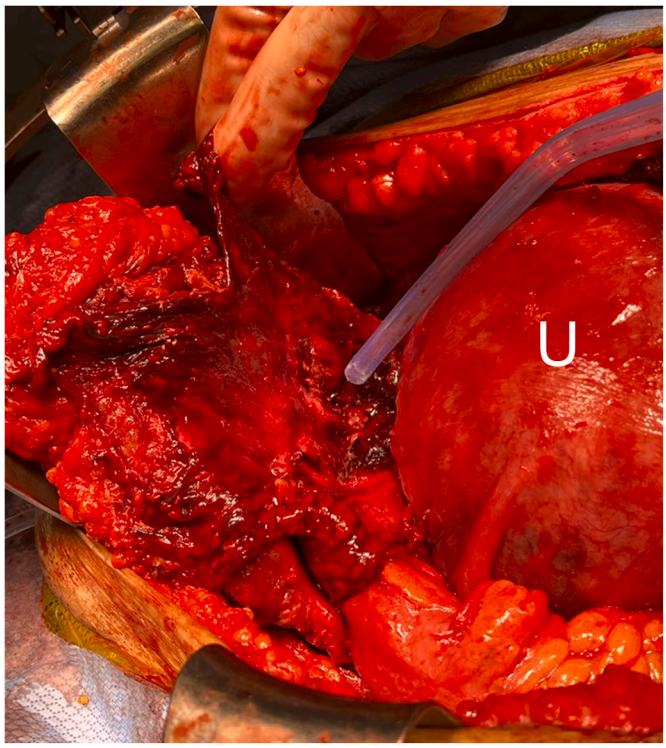

Fig. 3. En bloc resection of the urachal mass and umbilicus at 18 weeks gestational age. The gravid uterus is indicated by a white U. In addition to this specimen, pelvic lymphadenectomy was completed due to necrotic appearing lymph nodes, and an ileocolic resection was performed because of inflammatory involvement. Final pathology was without evidence of malignancy but instead most consistent with a tubo-ovarian abscess.

Notably, our patient had a copper IUD removed approximately one month prior to conception. Additionally, tubo-ovarian abscesses associated with *Actinomyces* are frequently misdiagnosed as ovarian malignancies due to their unusual appearance on imaging, including MRI.[4,5] Although the midline location of our patient's abscess was also atypical, this could help explain the interpretation of her imaging.

4. Conclusion

In this article, we report the first case to our knowledge of a tubo-ovarian abscess masquerading as a urachal malignancy during pregnancy. Urologists, obstetricians, and gynecologists should also consider an infectious process in the differential of a presentation with abdominal

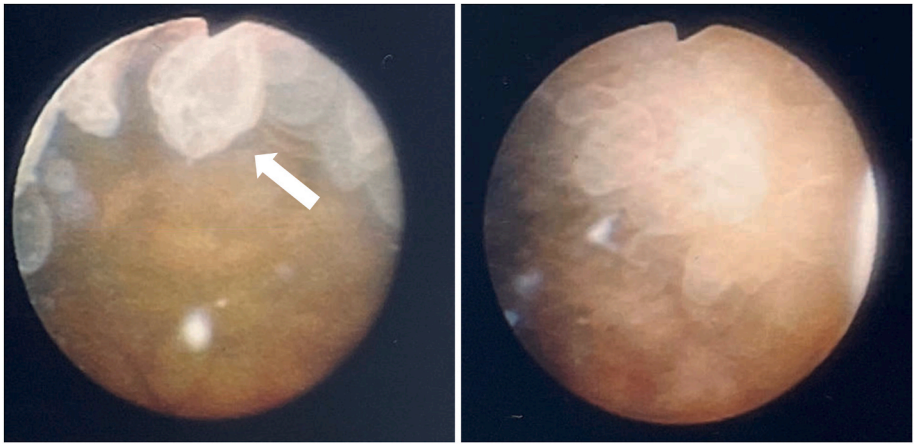

Fig. 2. Intraoperative cystoscopic images completed prior to transurethral bladder tumor resection (TURBT) at 16 weeks gestational age. Papillary fronds (white arrow) were seen within the bladder with inflammation throughout the bladder dome. TURBT was completed with resection of a 3-cm sample. Cytopathology of a bladder wash demonstrated atypical urothelial cells, acute inflammation, and reactive changes. Specimen pathology was consistent with polypoid cystitis without evidence of malignancy.

pain, irritative urinary symptoms, and a midline mass. This case also highlights the importance of a multi-disciplinary approach to the management of complex urologic patients during pregnancy and the crucial role of shared decision making with patients.

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