An ovarian torsion around a remnant of the urachus

Abstract
We report a case of ovarian torsion around a remnant of the urachus. Though it usually develops into the median umbilical ligament, abnormalities in urachal development can occur which can lead to remnants being present in the adult abdomen. This case describes a young female who had intermittent lower abdominal pain over a period of three weeks. During this period several ultrasound scans were performed which reported different anatomy and possible causes of the pain. Only on diagnostic laparoscopy and confirmed via histology, was it found that she had experienced ovarian torsion around an urachal remnant. Unfortunately due to the delay from symptom onset to her operation, her ovary was not salvageable. This case highlights the variability of ultrasound findings and demonstrates how a remnant can contribute to ovarian torsion and subsequent infarction.

Keywords: diagnostic laparoscopy, ovarian torsion, pelvic ultrasound, urachal remnant.

Introduction
During the fourth to seventh weeks of development in utero, the urogenital tract forms and the allantois is obliterated, forming the urachus. By adulthood, the urachus has developed into the median umbilical ligament which is a fibromuscular cord, with a broad base that narrows as it ascends. It contains a few vessels and in an anatomically normal adult, is coalescent with the anterior parietal wall and lies within the Space of Retzius, between the transversalis fascia anteriorly and the parietal peritoneum posteriorly. Occasionally abnormalities in development can occur and can result in a urachal fistula (completely patent urachus), urachal cyst (a section of patent urachus) or urachal sinus (patent upper portion of urachus).

Initial presentation
A 24-year-old female, gravida 3, para 4, having had her last menstrual period two weeks prior, initially presented to the emergency department (ED) with mild and intermittent lower abdominal pain. An ultrasound scan (USS)
showed a large, left ovarian multilocular cystic lesion. With this provisional diagnosis she was provided analgesia and referred to the gynaecology outpatient department (GOPD) for a repeat USS in two weeks to monitor for any change in the cyst.

**Outpatient investigations**
The repeat USS (trans-abdominal and trans-vaginal USS performed and reported by a sonographer in the medical imaging department of the hospital, using a Phillips iU22) reported a normal uterus with mirena in situ, an enlarged right ovary (volume 158 mL) with an associated cystic structure (5.7 cm x 5.2 cm x 6.8 cm, or 107 mL) (Figure 1).

This structure had thin septation and likely contained haemorrhagic material but had no vascularity. A second cystic structure was seen inferiomedial to the larger cystic structure. There was a small amount of free fluid around the right adnexa and in the pouch of Douglas. Based on these findings and ongoing intermittent but manageable pain, the patient was booked for a non-urgent right ovarian cystectomy.

**Second presentation**
However, that evening she presented to ED with significantly increased pain. It was described as a sharp and stabbing pain, relieved by sitting, worse on movement and associated with nausea. Significant past medical history included current antibiotics (amoxicillin/metronidazole) for a dental infection, a cholecystectomy for cholecystitis and cholelithiasis, two spontaneous vaginal deliveries and one caesarean section for twins.

**Investigations**
She was haemodynamically stable but on examination refused palpation of her left iliac fossa. The remainder of her physical examination was unremarkable. She was sent for routine bloods, urine dipstick and microscopy/culture/sensitivity (M/C/S) and another pelvic USS. The blood tests showed a mildly elevated white cell count (WCC) of 11.6 (neutrophils 8.7) but no other abnormalities. The urine results were normal and the patient’s pain resolved with morphine. The USS (trans-abdominal USS performed and reported by a sonographer in the medical imaging department of the hospital, using a Phillips iU22) showed a normal uterus with mirena in situ, a normal right ovary (volume 6.5 mL) and a large complex cyst (6.2 cm x 5.1 cm x 5.7 cm, or 94 mL) situated adjacent to the left ovary (Figure 2).

The cyst was anechoic with small septation and thick walls. No other masses or lesions were identified and no free fluid was noted. With these results and the resolution of the patient’s pain with analgesia, a provisional diagnosis of intermittent torsion of the left ovary secondary to a large complex ovarian cyst was made and the patient was admitted for observation and analgesia.

**Admission**
The following morning the patient became unwell with nausea, vomiting and increased pain. Though haemodynamically stable, on re-examination the patient exhibited rebound and percussion tenderness of the lower abdomen but no guarding. The patient was given analgesia, kept fasted and booked for diagnostic laparoscopy.

Laparoscopy showed a haemorrhagic left ovary, with the cyst and fallopian tube torted around themselves and around a ligament (suspected to be a remnant of the urachus) which was attached to the anterior abdominal wall (Figure 3). Due to the size of the haemorrhagic ovary and the inability to manoeuvre it around the ligament, the ligament was cut close to the anterior abdominal wall to allow mobilisation and adequate visualisation prior to a left salpingo-oophrectomy (Figure 4). Histopathology of both the ovary and the remnant was sent and confirmed the ligament to be consistent with the urachus.

**Discussion**
It is difficult to determine if the ovary had been torted around
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the fallopian tube, the urachal remnant or both, for the duration of the pain. It is possible that the patient was experiencing intermittent torsion around the fallopian tube until the day of surgery when the ovary became wrapped around the urachal remnant. Due to the intra-operative difficulty to move the ovary around the remnant until it was cut, it is likely that once the ovary had torted around the remnant, it could not revert.

Conclusion
Review of the literature shows this to be the first documented case of this occurring. This case highlights how an embryological remnant can cause significant morbidity. It is possible that until the ovary torted around the urachal remnant, it was only intermittently torting and possibly salvageable. However, once the remnant was involved, it could not revert and became vascularly compromised. This case should serve as an awareness tool for clinicians, sonologists and sonographers. Healthcare professions in this area of medicine should be aware that an abnormal embryological remnant such as this, could be a possible cause and can lead to significant morbidity if not considered. This case also highlights the variability in USS results. It was the scan that included both the trans-abdominal and trans-vaginal approaches that found the cyst to be associated with the right, not left, ovary. This may be explained by inter-sonographer reproducibility in ultrasound scans and the difficulty in imaging such structures in the pelvis.

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