CASE REPORT

Belly button piercings: a saving grace? A patent urachus presenting in a 17-year-old girl

Aidan Bannon,¹ Patrick Black,¹ Joanna Turner,² Sam Gray,³ Stephen Kirk¹

¹Centre for Medical Education, Queen's University Belfast, Belfast, UK

²Department of Radiology, Ulster Hospital Dundonald, Belfast, UK

³Department of Urology, Ulster Hospital Dundonald, Belfast, UK

Correspondence to

Aidan Bannon,
abannon04@qub.ac.uk

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SUMMARY

We report the case of a 17-year-old girl who presented to the accident and emergency department with dysuria and foul smelling, bloody discharge from her umbilicus. The definitive diagnosis was that of a patent urachus, which is a fistulous communication between the bladder and the umbilicus, usually diagnosed in early infancy. The incidence of a patent urachus is approximately 1 in 70 000 in the general population. It is highly likely that removal of a recent belly button piercing resulted in the acute presentation by completing the fistulous tract to the skin. This case is of clinical relevance as the diagnosis was missed 18 months prior with a milder presentation. The recommended treatment option is surgical excision due to the potential risk of malignant change, with urachal adenocarcinoma accounting for 0.3% of all bladder cancers.

BACKGROUND

This case illustrates a previously undiagnosed patent urachus in a 17-year-old girl and provides the reader insight into a rare but important cause of central abdominal pain and the uncommon symptom of a discharging umbilicus in a young adult.

The urachus, also known as the median umbilical ligament, is a remnant of the fetal bladder. The urachus normally obliterates by the fifth month of gestation when the bladder descends into the pelvis.¹ Incomplete narrowing and obliteration can lead to a number of pathologies including a patent urachus (~50% cases), a urachal cyst (20–30% cases), urachal sinus (~10%) and less commonly a urachal diverticulum.^{1 2}

Urachal anomalies are rare, but are associated with potentially life-threatening complications, which most commonly present in neonates and young children: including recurrent urinary tract infections, sepsis and vesicoureteric reflux. Neoplastic transformation, although rare, is a significant complication that can occur in adult life.^{2 3}

CASE PRESENTATION

The patient presented to the accident and emergency department with a 2-day history of severe abdominal pain, dysuria and foul smelling bloody discharge from the umbilicus, associated with nausea and vomiting. On examination, there was erythema and periumbilical tenderness. Relevant history included a milder presentation without umbilical drainage 18 months previously, which was treated with antibiotics.

In the intervening period, she had her belly button pierced, which remained in situ for 6 months before being removed. This non-healing piercing is considered the most likely precipitating factor of this recent presentation by completing the fistulous tract to the skin and leaving a patent tract on removal, accounting for the acute presentation of the 'discharging umbilicus', which had been previously absent.

INVESTIGATIONS

Full blood picture, urea and electrolyte profile, and urinalysis were normal. An ultrasound scan showed a urachal abnormality, thought to be a patent urachus or a urachal diverticulum.

A cystogram initially revealed a urachal diverticulum (approximately 1 cm in size) at the anterior superior aspect of the bladder dome. The radiologist was unable to fill the diverticulum despite injecting 300 mL of contrast into her bladder, and was thus unable to demonstrate a patent urachus all the way to the skin (figures 1 and 2).

The patient was discharged on a course of antibiotics with the view of being managed as an out-patient until surgery could be organised.

DIFFERENTIAL DIAGNOSIS

In clinical situations where abdominal pain is associated with an abdominal mass and/or umbilical discharge with or without fever, an ultrasound scan should be considered for each of the following differentials:

- ▶ Patent urachus
- ▶ Urachal cyst
- ▶ Urachal diverticulum
- ▶ Urachal sinus

Associated anomalies also include: umbilical hernia, inguinal hernia and bowel fistulae.¹ In total 46% of paediatric patients who present early have associated conditions such as hydronephrosis and vaginal atresia. In all paediatric cases, vesicoureteric reflux should be investigated and excluded.^{2 4 5}

TREATMENT

Two months later, the patient underwent cystoscopy under general anaesthetic. The opening of the urachus was visualised at the bladder dome but it was not possible to advance the scope further into the lumen. The external communication was also visualised when pressure was applied to the umbilicus.

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Figure 1 Cystogram, anteroposterior view.

OUTCOME AND FOLLOW-UP

The outcome of the cystoscopy was discussed with the patient and it was explained that the next treatment option available to her was surgical excision of the patent duct. The proposed surgery was explained to the patient, as involving a lower midline incision from the umbilicus to the pubic symphysis.

The patient underwent surgery with the urachus identified and excised to the umbilicus. The bladder was repaired in a standard double layer. Postoperative recovery was uneventful with an unremarkable cystogram at 10 days, leading to catheter removal.

DISCUSSION

The incidence of urachal anomalies in the general population is low. Previous studies have shown that urachal anomalies account for as few as 1 in 70 000 people.¹ However, the potential

Figure 2 Longitudinal sagittal ultrasound image demonstrating a thickened patent urachus.

clinical implications are significant with reported urachal infections leading to peritonitis and overwhelming sepsis. Associated vesicoureteric reflux occurs with increased incidence in neonates.²

Studies to date have shown that the mean age of presentation is 3.9 years, with a typical age range between 1 day and 12 years.¹ It is highly unusual for a patient to present so late in life with a patent urachus, which potentially highlights why our patient was incorrectly diagnosed on her first presentation.

A patent urachus is the most common of all urachal anomalies (up to 50%), but urachal cysts and diverticula have a higher incidence in the adult population. The literature documents that abdominal pain accompanied by umbilical discharge or an abdominal mass with fever and dysuria is indicative of such a urachal anomaly, requiring an ultrasound scan, which proves diagnostic in 80–100% of cases.^{1 5}

Interestingly, a review of the literature highlighted a case where a man presenting with umbilical discharge was referred to dermatology and mistreated with cryotherapy for a suspected pyogenic granuloma before being correctly diagnosed with a urachal sinus. This case further emphasises the importance of a detailed history, appropriate initial investigation and management plan.⁶

Adenocarcinoma of the urachus is a rare but serious consequence in later life, accounting for 0.3% of all bladder cancers, with a 5-year survival of 48%.^{3 7} The majority of patients present in their early 50s with a male:female risk of 1.5:1. Most patients present with locally advanced or metastatic disease, which highlights the importance of early detection in this particular case.⁸

Currently the recommended treatment option for urachal carcinoma is surgical excision, which includes partial cystectomy with radical resection and excision of the urachal remnants in the majority of cases. Chemotherapy is often reserved for patients with metastatic or unresectable disease but as local recurrence rates are as high as 38%, primary adjuvant chemotherapy preparations of 5-fluoruracil and cisplatin or gemcitabine and cisplatin can be indicated, with a response rate of 48%.⁹

Metastatic disease is common in urachal carcinomas; the most common sites are the lungs (50%), lymph nodes (46%), bones and intestines (30%) and the brain (20%).⁸ In patients with metastatic disease on a chemotherapy regime of gemcitabine and cisplatin, the median survival is 23 months.⁹

This case remains of clinical interest due to the exacerbation of the patient's symptoms after her belly button piercing was removed, completing the fistulous tract to the skin. The case raises the question of when, if at all, the patient would have presented with complications, had the belly button piercing not been removed?

Learning points

- ▶ The reader should have an awareness of urachal anomalies and the associated risk of malignant transformation.
- ▶ The reader should recognise the symptomatology of urachal anomalies defined by the presence of abdominal pain, umbilical discharge and dysuria±abdominal mass and pyrexia.
- ▶ An ultrasound scan is the gold standard diagnostic technique of such anomalies with a sensitivity of 80–100%.

Competing interests None.

Patient consent Obtained.

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