

Urachal sinus in an adult – an uncommon presentation

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This case report documents a 32-year-old male patient who presented with recurrent urinary tract infections and periumbilical discharge. Radiological investigations showed an urachal sinus with a communicating tract to the dome of the bladder. The patient underwent successful endoscopic removal of the urachal sinus including the dome of the bladder, which was then closed with sutures. Histopathological examination confirmed the diagnosis of urachal sinus. The patient had an uneventful postoperative recovery with no recurrence of symptoms during the follow-up period. Urachal sinuses are infrequently reported and usually asymptomatic unless complications arise, typically from an infection. Early diagnosis and prompt surgical management are essential to prevent complications.

Keywords: urachal sinus, laparoscopic surgery

Introduction

The urachus or the median umbilical ligament is a fibrous strand connecting the umbilicus to the bladder, representing the embryologic remnant of the cloaca and allantois.¹

Incomplete regression of the foetal urachus causes urachal abnormalities, and are more common in children than in adults due to urachal obliteration in early infancy.² This structure is normally a thin fibrous cord; and various urachal abnormalities such as, a patent urachus, urachal cyst, umbilical urachal sinus, or a vesicourachal diverticulum, can develop.³

The symptoms of these abnormalities may include discharge from the umbilicus, lower abdominal pain, fever, a palpable abdominal mass, dysuria or urinary tract infection.

There are different treatment options for an infected urachal sinus. The primary treatment, however, is surgery to eradicate the remaining urachal tissue throughout its length due to the risk of developing infections or carcinoma.

This case report describes a case of an infected urachal sinus in an adult presenting with purulent discharge from the umbilicus, which was successfully treated with laparoscopic surgery.

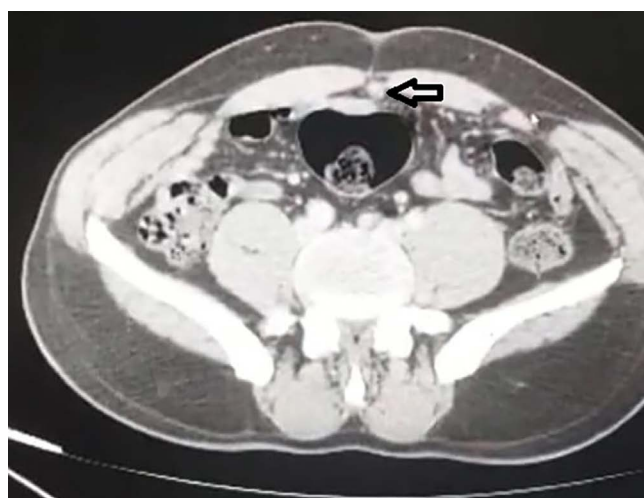


Figure 1: Computed tomography of the urachal sinus (black arrow)

Case report

A 32-year-old male presented with a purulent discharge from the umbilicus which has been present for two months. He had no fever, no urinary symptoms and no abdominal pain. An abdominal examination revealed pain on palpation of the umbilicus area. The abdominal ultrasonography was normal. A computed tomography (CT) scan found an 8.5 × 7 mm rim enhancing collection of the umbilical region related to a urachal sinus (Figure 1). The patient was initially treated with cefixime. The discharge temporarily stopped but reappeared after the antibiotics were done.

The urachal sinus and tract (Figure 2) were excised laparoscopically under general anaesthesia.

After three ports were placed (Figure 3), the urachal remnant was dissected from the abdominal wall to the Retzius space to identify the dome of the bladder. The urachal sinus as well as the dome



Figure 2: Urachal sinus and bladder dome

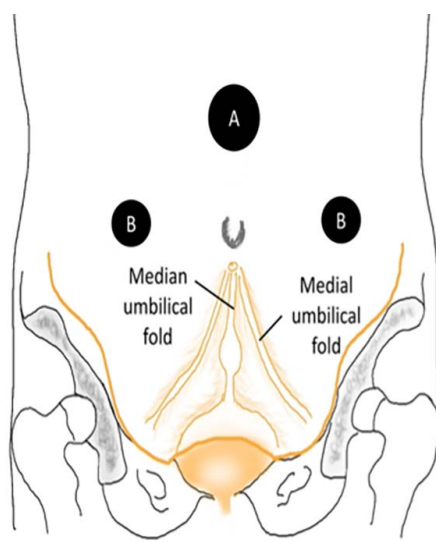


Figure 3: Port incision sites – (A) 10 mm camera port; (B) 5 mm trocar diameter

of the bladder were removed, whereafter the bladder was closed with suture. The patient was discharged on the second day with oral antibiotics and the Foley catheter was removed on the fifth day. There were no perioperative complications. The pathological results indicated a granulation tissue tract between the skin and the bladder, which is consistent with an infected urachal sinus.

Discussion

The urachus is a vestigial remnant of at least two embryonic structures: the cloaca and the allantois. The tubular urachus normally involutes before birth, remaining as a fibrous cord between the transversalis fascia anteriorly and the peritoneum posteriorly, and attaches the umbilicus to the bladder dome.

Urachal abnormalities occur when the foetal urachus fails to close completely. There are five different types of urachal abnormalities that can occur, namely:

- i. Patent urachus – the entire tube remains open and does not close (50% of cases).
- ii. Urachal cyst – both ends of the canal close, leaving a central portion open (30% of cases).
- iii. Urachal sinus – the tube drains into the umbilicus (15% of cases).
- iv. Vesicourachal diverticulum – the tube remains connected to the bladder (3–5% of cases).
- v. Alternating sinus – the tube can drain to either the bladder or umbilicus.

These abnormalities, which can be diagnosed either at birth or later in life, may cause various symptoms. Treatment usually involves surgical removal of the affected tissue to prevent complications such as infection or malignancies. There are several genetic conditions that have also been associated with the development of urachal sinus, including Patau syndrome, Edwards syndrome, and Down syndrome. However, in many cases, the cause of urachal sinus is not related to genetics and it may be a result of a developmental abnormality during foetal development.

The clinical presentation of a patient with urachal abnormalities may vary, but commonly includes symptoms such as umbilical or urinary discharge, umbilical mass, vague abdominal pain or haematuria. Accurate diagnosis is aided by careful evaluation of the type of discharge present. Urine discharge from the umbilicus may suggest patent urachus, while haematuria may indicate the presence of a vesicourachal diverticulum. In contrast, pus discharge from the umbilicus may be indicative of an umbilical or urachal sinus. In some cases, the patient may present with complications such as infection or malignancy, underscoring the importance of prompt diagnosis and appropriate management.

A urachal sinus abscess usually occurs by infection of mucinous secretion via the umbilicus. The commonly cultured microorganisms from the pus are *Escherichia coli*, *Enterococcus faecium*, *Proteus*, *Streptococcus viridans* and *Fusobacterium*.⁴

Urachal sinus is largely asymptomatic until it becomes infected. However, a tender midline infraumbilical mass or an umbilical discharge can be found.

Differential diagnosis of this condition includes anomalies of the vitelline ducts (such as Meckel's diverticulum), infected umbilical vessel, appendicitis or omphalitis.⁵

Urachal sinus can also be diagnosed through radiological imaging including ultrasound, CT scan and magnetic resonance imaging (MRI) scan. The characteristic finding for urachal sinus on ultrasound is a tubular structure extending from the bladder dome to the umbilicus. On CT scan, the urachal sinus may appear as a low-density area with enhancing walls. On an MRI scan, T2-weighted images can show a fluid-filled sinus tract communicating with the bladder dome.

The gold standard for the diagnosis of urachal sinus is generally considered to be histopathological examination of the surgically resected specimen. However, in cases where surgical intervention is not required, radiological imaging is relied upon for diagnosis.

The sensitivities and specificities of these imaging modalities for the diagnosis of urachal sinus vary depending on the study and the population being examined. Generally, ultrasound and a CT scan have high sensitivity and specificity, while the sensitivity and specificity of an MRI scan can be lower. It is important to note that radiological imaging should be interpreted in conjunction with clinical and histopathological findings.

Urachal cyst treatment depends on the presence of complications or associated conditions. A non-infected urachal sinus is usually removed in a single-step radical excision of the remnant which removes the entire lesion with or without a bladder cuff via either an open or a laparoscopic surgical approach.⁶ In case of infection, antibiotics are given, and incision or drainage of the sinus is done, followed later by excision of the urachal sinus.

Conclusion

Urachal sinus is a blind dilatation of the urachus at the umbilical end and is subject to infection. The diagnosis can be done by

ultrasonography, CT scan or MRI scan. The treatment is surgical with the excision of the urachal remnant.

Conflict of interest

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