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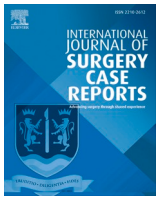

Case report

Infected urachal sinus with de novo stone and peritonism in a young athlete adult: A case report

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ABSTRACT

Introduction and importance: Urachal cyst (UC) sinus occur secondary failed regression of allantois's embryonal canal during fetal development. Several types depending on the arrest level and connection to the urogenital tract. Umbilical urachal sinus is characterized in less than 15 % of cases. An infected urachal sinus patient can present with umbilical sinus and purulent discharge with various emergency presentations and scenarios.

Case presentation: A 26-year-old Sudanese male, a healthy athlete, presented two weeks before the last presentation with periumbilical discomfort, and umbilical discharge increased with physical activity. He was first seen in the outpatient clinic and diagnosed with an uncomplicated umbilical cyst. One week later, periumbilical pain became throbbing, severe with a dragging sensation, and skin erythema. His swelling produced purulent discharge with concomitant low-grade fever. He denied any past medical, surgical, or family history.
An ultrasound scan revealed a periumbilical cyst confirmed by CECT consistent with an infected urachal sinus. Surgical excision of the cyst and umbilicoplasty was achieved with an uneventful postoperative course.

Clinical discussion: Urachal sinuses may vary in their presentation according to the anomaly and clinical effect. It can be daunting to diagnose, even with the availability of CECT modalities. Conservative management can be of benefit in case of incidental findings, but surgical management is the preferred approach for complicated patients. A laparoscopic approach is the recommended treatment.

Conclusion: Our case report shows that serious complications can be prevented with early diagnosis, management, and prompt surgical intervention if this rare diagnosis is kept in mind.

1. Introduction

Urachal cyst and sinus occur secondary to incomplete resolution of the embryological canal of allantois during fetal development. This congenital remnant is a firm string appearing from the developing anterior-superior urinary bladder wall extending cranially to the vanishing allantois and omphalos. Several types depend on the arrest level and connection to the urogenital tract. Umbilical urachal sinus signifies less than 15 % of cases [1].

In addition, various clinical emergency presentations were reported ranging from an uncomplicated abscess and miss diagnosed strangulated umbilical hernia up to severe peritonitis. Uncommonness, unusual signs, presenting symptoms, and manifestations of the disease resemble a challenge for clinicians to reach a diagnosis with a few reported cases of urachal anomalies in emergency adult admissions. An infected urachal cyst sinus presenting with umbilical sinus and purulent discharge is the most observed first presentation of the persistent urachal sinus in adults [2]. This work has been reported in line with the SCARE criteria [3].

2. Case presentation

A 26-year-old Sudanese male, a healthy athlete, presented two weeks before the last presentation with periumbilical discomfort and clear umbilical discharge, minimal amount, spontaneous, and increased with physical effort. He was first seen at an outpatient clinic and diagnosed with periumbilical cystic swelling based on an abdominal ultrasound scan. For which oral analgesia and prophylactic antibiotics were prescribed. One week later, his periumbilical pain became throbbing,

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severe pain with a dragging sensation, and associated skin erythema. His umbilical swelling produces a purulent discharge with concomitant low-grade intermittent fever. The pain is slightly relieved by oral analgesia and leaning forward but worsened by coughing and lying flat on the bed. He denied any past medical and surgical history. No family history of a similar condition, urological diseases, or allergies was reported.

Vital signs were normal apart from mild tachycardia of 104 beats/min; physical examination revealed tender umbilical swelling of (4 × 6 cm) with everted central umbilicus, bulging sinus, purulent brownish discharge, periumbilical skin erythema, and associated central abdominal guarding. No organomegaly or deep masses were detected. Bowel sounds were normal in frequency and quality. Laboratory investigations, blood biochemistry, and Urinalysis were unremarkable.

Abdominal ultrasound scan showed a (1.9 × 1.9 × 1.4 cm) well-defined midline homogenous hypoechoic cystic lesion, infra umbilical location communicating with subcutaneous tissue through the Linea Alba, smooth wall & faintly echogenic smooth surface content surrounded by clear fluid, and no detectable peripheral vascularity (Fig. 1). Confirmatory CECT abdomen requested after emergency presentation showed a retro-umbilical cystic swelling (2 × 2.5 × 3 cm) with wall enhancement after IV contrast consistent with infected umbilical urachal cyst & sinus (Fig. 2A & B). His cyst extends from subcutaneous tissues through Linea Alba, reaching the parietal peritoneum but not communicating with the urinary bladder (Fig. 3). Therefore, an evident diagnosis of infected urachal cyst and sinus with localized peritonitis was made.

The patient underwent surgical exploration through a lateral curved umbilical incision with an infra-umbilical midline extension. Excision of the cyst & sinus, intra-luminal stone (urachaolith) in the subfascial compartment of (1 × 1.5 cm), intraperitoneal omental adhesion to the posterior cyst wall shown, no anatomical connection to the urinary bladder (Fig. 4). Complete surgical excision of the cyst was achieved with the sinus and central part of the umbilicus. Omentum adhesions were released, a free urinary bladder dome, and primary mass closure of the anterior abdominal wall using a non-absorbable size one prolene suture & umbilicoplasty. The laparoscopic approach was not considered due to financial reasons, and robotic surgery is not available in Sudan. Uneventful smooth postoperative recovery course, patient discharged home on day two postoperative with oral ABX cefuroxime tables 500 mg twice a day for five days and resumed regular activity after a six-week follow-up.

The histopathology examination report confirmed the diagnosis of an infected urachus cyst and no malignant changes or cyst wall calcification.

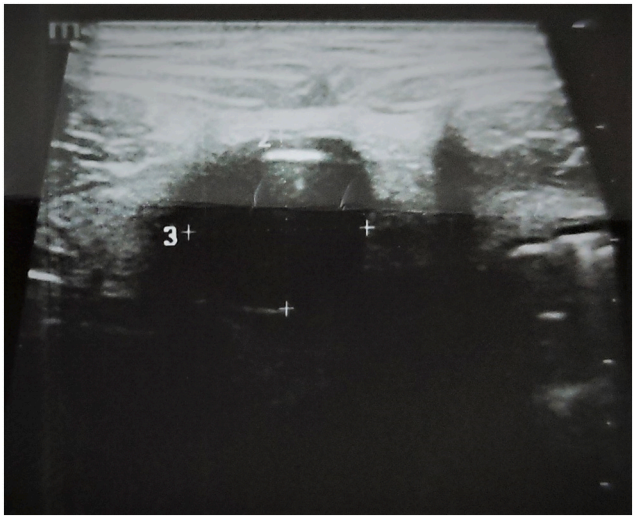

Fig. 1. Ultrasound scan image showing the urachal cyst.

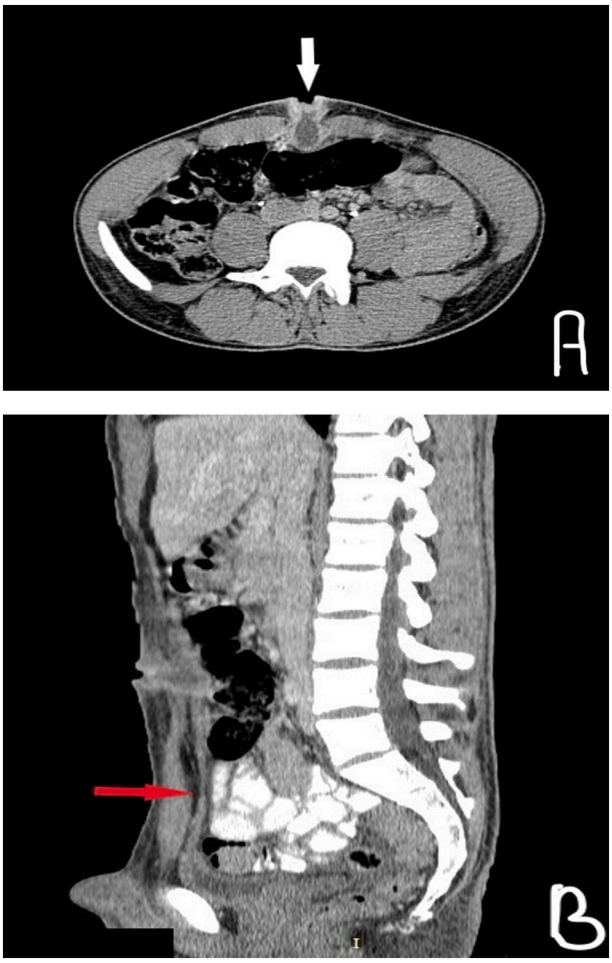

Fig. 2. Computed tomographic scan of the abdomen showing: A. Urachal sinus (coronal section). B. Obliterated median umbilical ligament & urinary bladder (sagittal section).

Fig. 3. A hand drawing illustrates the findings and anatomical relations.

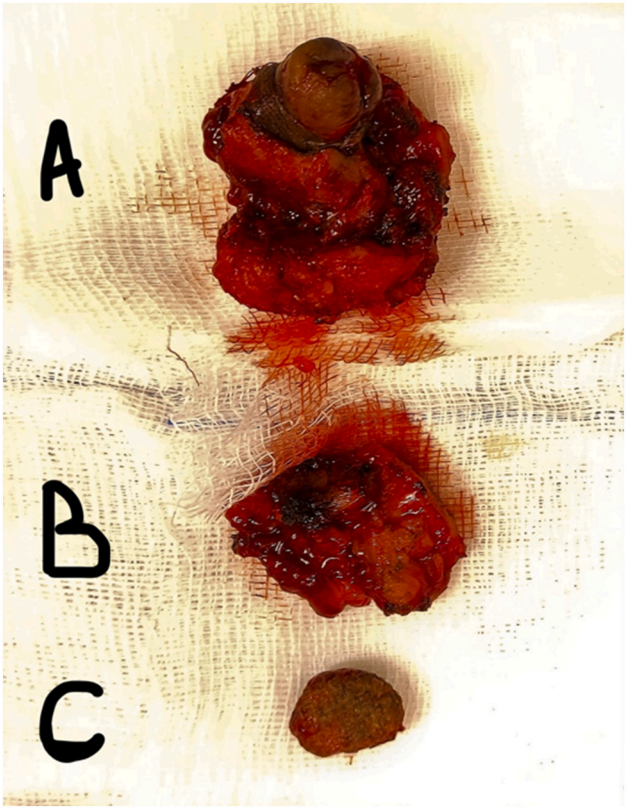

Fig. 4. Postoperative specimen (A. umbilical sinus with the subcutaneous component, B. subfascial component of the cyst with omental bad at the base, C. urachal stone/urachaolith).

3. Discussion

A urachal congenital anomaly can present in infancy due to a widely patent tract or posterior urethral valve or in the elderly subordinate to lower urinary tract obstruction. Urachal diseases are either congenital or acquired, and congenital variances arise after urachal obliteration failure [4]. It is contained in the anatomical space of Retzius between fascia transversalis and parietal peritoneum in the midline.

Patients' presentation may vary according to the underlying anomaly and pathological changes leading to the presentation. Omphalitis and umbilical infection are the first diagnoses when patients complain of umbilical discharge and pain in emergency departments. The wide range of differentials if the patient complaint only from periumbilical pain with or without swelling can be confusing to clinicians with consideration of common surgical conditions mimicking acute appendicitis, hematoma, ventral or umbilical hernia, and tumor lesions, especially when it develops into the abdominal wall or even Meckel's diverticula [5,6]. As the condition persists, urachal abscess after infection establishes, pain increases, skin changes occur, and discharge may change into purulent pussy discharge. Unless early recognized and promptly treated, it can progress to a more severe condition such as abdominal wall cellulitis, necrotizing fasciitis, and even peritonitis.

Our patient was a young athlete adult, who started complaining of peri-umbilical pain, swelling, and discharge post vigorous abdominal exercise without any previous abdominal or urinary complaint. Therefore, we propose that the condition was a concealed urachal cyst that got infected. After a vigorous workout, the overlying skin was strained, causing bacterial inoculation into the cyst, forming an infected urachal cyst and sinus with the stone presence working as a secondary bacterial harbor. As a result, the overlying peritoneal inflammation at the base of the cyst was covered by the great omentum leading to the dragging sensation and periumbilical guarding with peritonism.

Ultrasound scan is considered a highly accurate, non-invasive procedure that can be done as a bedside examination with a predictive value of 79–83 % positivity and 25–30 % negativity for ultrasonic detection of cystic urachal lesions, respectively [7,8]. When peritonitis and complicated disease are suspected, a CECT abdomen is considered superior in reaching a definitive emergency diagnosis and excludes other causes of peritonitis and visceral pathologies.

Surgical excision is the only radical treatment for complicated urachal remnants with its whole spectrum of the disease. However, the surgical choice and type of surgery depend on multiple factors, anatomical extent, and type of urachus anomaly. In our case, the cyst had taken the shape of a “Sand Watch/Hourglass” with the subcutaneous part herniating through constricting fascial umbilical defect and communicating with the subfascial components, and omentum stacking at the base indicative of initiated peritonitis. In addition, Blicher-Toft and Yoo KH et al. stated that up to a third of excised infected cysts returned in contrast to uncomplicated sterile counterparts. Thus, evidence and literature advise that all urachus anomalies and remnants must be radically excised to prevent associated comorbidities, metaplasia, and progression to malignancy [9–11].

Calculi and stones were reported in urachal remnants. However, most reported cases are seen in the urachal cyst, urachal xanthogranuloma, calcifications related to cancers, or vesicourachal diverticulum. Therefore, we are introducing the terms urachaolith and urachaolithiasis to be recognized and searchable in the literature, referring to stones found in noncommunicating urachal cysts or sinuses without patent communication with the urogenital system or calcified malignancy at histopathology.

4. Conclusion

Our case report shows that urachal sinus with intra-luminal calculus can be daunting to diagnose, even with the availability of CECT abdomen modalities. However, serious complications to be prevented with early diagnosis, proper management, and prompt surgical intervention can be achieved if this rare diagnosis is kept in mind.

Abbreviations

UC	Urachal cyst
ABX	Antibiotics
CECT	Contrast-enhanced computed tomography

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.

Availability of data and materials

The datasets used during the current study are available from the corresponding author upon reasonable request. All medical data, supporting materials, and images are available upon request.

Provenance and peer review

Not commissioned, externally peer reviewed.

Ethical approval

The hospital ethical committee obtained ethical approval for publishing this case report.

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Research registration number

N/A.

CRediT authorship contribution statement

NIMM & MEAN conducted the first assessment management in an outpatient clinic. MEAN contributed to patient surgical management during admission, surgical intervention, and postoperative follow-up. MEAN, and RM did the writing and coordination to draft the manuscript. MEAN, NIMM, and RM read and approved the final manuscript.

Conflicts of interest

All authors state that they are no competing interests.

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