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Case Report

An infected urachal cyst forming an abscess: A case report ☆,☆☆

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ABSTRACT

Urachal cysts are conditions present at birth that usually occur in children. This disease is very rare in adults. Approximately 35% of patients present with complaints of lower abdominal pain, signs of urinary tract infection, painful lumps in the abdomen, and hematuria. Here we present a case of A 27 year old woman came to the emergency unit with a lump in her stomach since 3 months before admitted to the hospital, located in the lower abdomen, the initial lump was the size of a marble, it got bigger over time and the patient felt feverish. The lump size was the size of a fist and burst open releasing pus and blood. This patient was diagnosed using CT-scan and Ultrasonography. This patient did not undergo any treatment, and chose to go home resulting in a loss to follow up. Urachal residual disease is a rare and manifests with nonspecific abdominal or urinary tract signs and symptoms. Although rare, disorders of the urachus can take the form of acute, life-threatening infections or malignant degeneration. It is important to carry out an accurate diagnosis and appropriate treatment. Urachal anomalies are rare in adults and often undiagnosed due to their nonspecific clinical course. Early diagnosis using several modalities such as ultrasonography and CT-Scan can help in planning an appropriate surgical intervention, thereby reducing morbidity.

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Introduction

Urachal cysts are conditions present at birth that usually occur in children. This condition is extremely rare in adults, with its incidence being largely unknown [1]. Urachal cysts form when there is a disruption or incomplete obliteration of the

urachus remnant, the structure that connects the umbilical cord to the fetal bladder. Essentially, the urachus is a fibrous cord originating from the front wall of the bladder and extending upward towards the umbilicus. It can also arise from the shedding and degeneration of the urachal epithelium [2]. The link between the urachus and the bladder enables microorganisms to enter, leading to fever, abdominal pain, and

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sometimes presenting symptoms similar to acute abdomen, a palpable abdominal mass, or a urinary tract infection [2]. Infected urachal cysts can rupture the peritoneal cavity, a rare complication most commonly seen in children. The occurrence of urachal cysts is 1 in 5000 live births. While most cases are asymptomatic, approximately 35% of patients report lower abdominal pain, urinary tract infection symptoms, painful abdominal lumps, and hematuria. The diagnosis of urachal cyst may be sudden during an abdominal ultrasound or cystography for different purposes; or while assessing symptoms like severe abdominal pain, repeated urinary tract infections, fever, an abdominal mass, or other similar conditions [3–7]. Conservative management is usually carried out in infants diagnosed within their first year. The clinical picture is variable which poses a diagnostic challenge. Various diagnostic methods can be employed to investigate and confirm clinical suspicions: ultrasonography, computerized tomography (although it is less frequently used in pediatric cases), voiding cystourethrography, and fistulography [8–11]. An infected urachal cyst is a type of urachal abnormality that generally manifests in children since obliteration normally occurs during early infancy. Rarely, it can appear in adults, either because of its low incidence or unnoticed symptoms until adulthood. The condition is rarely reported in the literature. Misdiagnosis can lead to severe complications, such as progressive infection or malignancy, highlighting the importance of early detection [12]. Here we report a case of Infected urachal cyst type C which extends to the musculus and subcutis of the lower abdominal wall forms an abscess formation.

Case report

A 27 year old woman came to the emergency unit with a lump in her stomach since 3 months before admitted to the hospital, located in the lower abdomen, the initial lump was the size of a marble, it got bigger over time and the patient felt feverish. The final size was the size of a fist and burst open releasing pus and blood. This patient also complained a decreased in appetite (Fig. 1). There was a weight loss of 7 kg in 3 months. On examination, there was no fever. She gave birth to 1 child in 2018 via caesarean section and has not undergone any other surgery. Laboratory results including renal parameters, blood count, and urine analysis were normal except for leukocytosis of 16,880 cells per ml (normal range: 4000-12,000 cells per ml).

Ultrasonography showed a heterogeneously hypoechoic, well-defined, regular-edged, semi-solid mass without calcification measuring $7.35 \times 6.21 \times 9.24$ cm in the lower abdomen (Fig. 2). On color Doppler examination, vascularization of the edges of the mass was visible. This patient also undergone CT-Scan examination which shows an underfilled bladder, thickened anterior wall, no visible stones (Fig. 3). The lesion is isodense, well-defined border, the edges are regular, the diameter is 0.43 cm superoanteriorly of the bladder which appeared to be connected to the umbilicus with fast stranding around it, postcontrast scan showed heterogeneous enhancement. Isodense lesions appear with hypodense air-density lesions inside, well-defined, irregular edges, size $7.29 \times 5.20 \times 7.85$

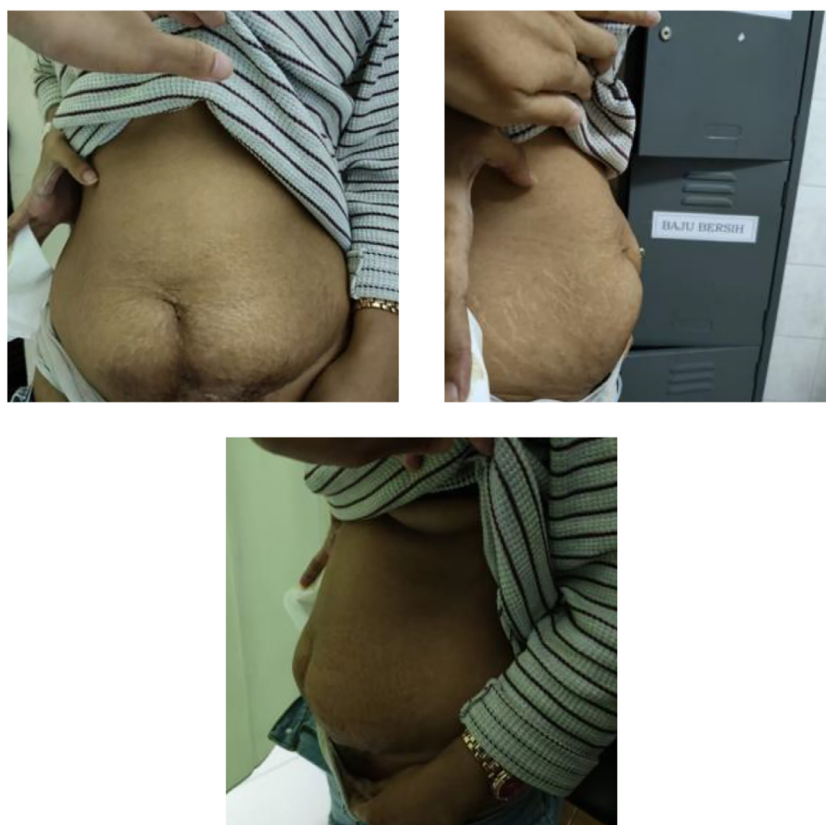


Fig. 1 – Clinical picture of the patient.

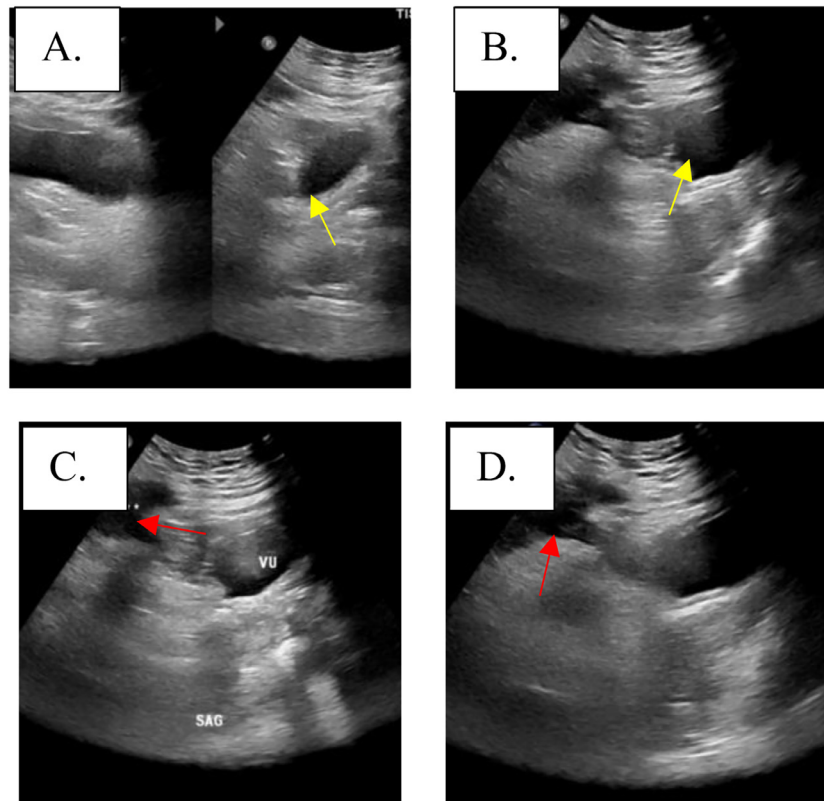


Fig. 2 – Abdominal USG (A and B) The urinary bladder of this patient is visible through abdominal USG (yellow arrow). (C and D) Abdominal ultrasound with urachal cyst (a heterogeneous, hypoechoic, well-defined, regular-edged, semi-solid mass without calcification measuring 7.35 x 6.21 x 9.24 cm in the lower abdomen.) (red arrow).

cm on the lower abdominal wall which extends to the subcutis accompanied by fat stranding around it, seems to be related to lesions in the superoanterior bladder, postcontrast scan shows heterogeneous enhancement. This examination resulted in a diagnosis of infected urachal cyst type C which extended to the musculus and subcutis of the lower abdominal wall to form an abscess formation. This patient did not undergo any treatment, and chose to go home resulting in a loss to follow up.

Discussion

The urachus is part of the allantois which is an embryological remnant that can be found between the medial umbilical ligament which is also an embryological remnant originating from the umbilical artery. The allantois develops around the 16th day of pregnancy and disappears when the bladder descends into the pelvis. During the fourth and fifth months of pregnancy, the distance between the bladder's top and the umbilicus grows. Furthermore, the urachus, or medial ligament, becomes a fibrous cord that extends from the bladder's top to the umbilicus, typically measuring 3-10 cm in length and 8-10 mm in diameter. This fibroid cord is located between the transverse fascia anteriorly and the peritoneum posteri-

orly. Urachus can form due to a number of growths and atrophy that occur after birth. If the growth or proliferation of the fetal urachus does not keep pace with the growth of the abdominal wall, as with other residual structures, stretching of the urachus will result in atrophic protrusions in the area [13].

Histologically, the urachus is composed of 3 tissue layers. The innermost layer is made up of modified transitional epithelium with 3 cell layers surrounding a potential central lumen. The middle layer consists of connective tissue containing blood vessels and lymphatic tissue. The outermost layer consists of involuntary muscles arranged in irregular circular patterns [14].

If the regression of these embryological remnants is incomplete, urachal disorders may arise. Urachal residual disease is rare and usually presents with vague abdominal or urinary tract symptoms. Although infrequent, urachal disorders can result in severe infections or malignant transformation. Accurate diagnosis and appropriate treatment are essential. However, due to the low prevalence of urachal anomalies, making a definitive diagnosis before surgery is difficult [3].

Symptoms of urachal remnants, including urachal cysts can vary. So to diagnose urachal cysts, modalities are needed. Ultrasound is the main choice because of its advantages, such as being easy to perform, noninvasive, being able to determine potential communication with the bladder and the absence of exposure to dangerous radiation [15]. The urachal cyst itself

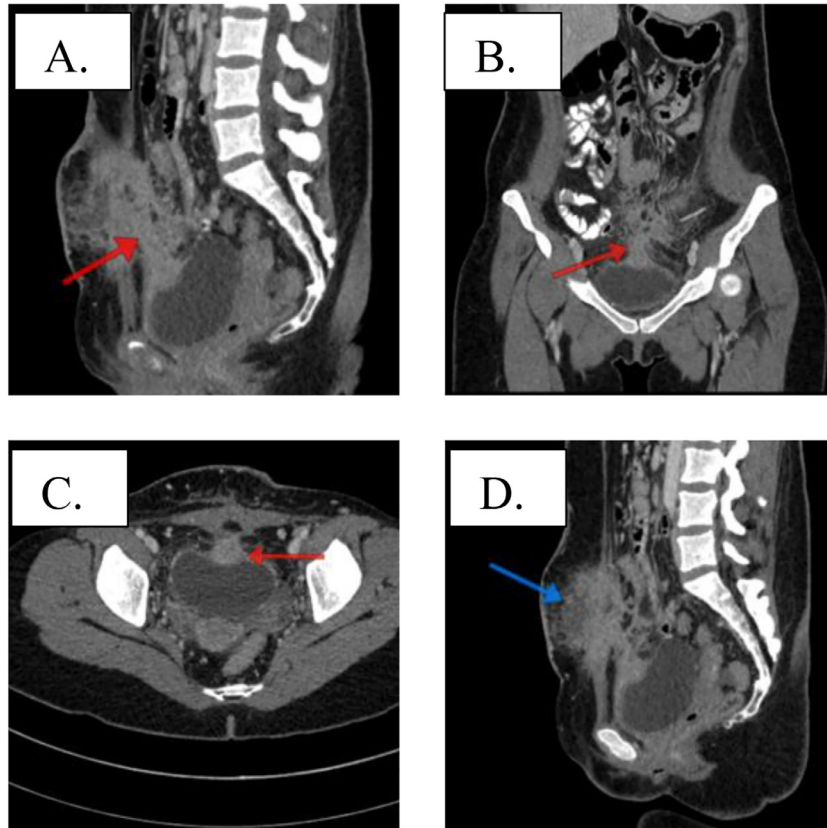


Fig. 3 – (A-C). Pictures show the lesion which is isodense, has well-defined borders, regular edges, with the diameter of 0.43 cm in the superoanterior of the urinary bladder which appears to be connected to the track to the umbilical accompanied by fast stranding around it, post contrast scanning shows heterogeneous enhancement (red arrow). **(D)** Picture shows an isodense lesion appears with a hypodense air-density lesion inside, firm borders, irregular edges, size 7.29 × 5.20 × 7.85 cm on the lower abdominal wall which extends to the subcutis accompanied by fast stranding around it, which seems to be related to a lesion in the superoanterior of the urinary bladder, post contrast scanning shows heterogeneous enhancement (blue arrow).

on ultrasound appears hypoechoic. Ultrasound can also detect internal echoes within infected cysts and can be used to guide diagnostic aspiration. Additionally, ultrasound is the most accurate modality (accuracy varies from 61.1% to 91.3%). Apart from ultrasound, CT is also a diagnostic modality for urachal cysts, but its application is rare in children. The typical CT appearance is a simple fluid-thinning lesion just on the posterior abdominal wall, often adjacent to the bladder dome and as a well-circumscribed, homogeneous lesion occupying the pre-vesical space on CT. Apart from ultrasound and CT, there are also voiding cystourethrography and fistulography. Fistulography may also be useful in determining the presence or extent of communication with the digestive tract, urinary tract, or umbilicus before surgery [16,17].

The imaging techniques used for this patient reveal details about the cyst's size and its relationship to nearby tissues, but distinguishing between infected urachal cysts and urachal carcinoma is challenging. Both conditions may show increased echogenicity on ultrasound and thick walls on CT scans. Infected urachal cysts can cause abdominal pain, abdominal tenderness, fever, nausea, vomiting, dysuria, diffi-

culty urinating, *N. gonorrhoea* urethritis, epididymitis, and orchitis upon presentation. Conservative management is recommended in newborn in the first year of life because spontaneous involution of the urachus can occur. A surgical approach with wide local resection of the urachal remnant to the bladder dome and surrounding inflammatory tissue is recommended in the treatment of this lesion because of the potential for recurrent inflammation and the risk of malignant degeneration. Inadequate resection may increase the risk of recurrence of periumbilical discharge as well as the possibility of malignant transformation of the urachal remnant. Tumors may arise along the course of the urachus, but most appear as adenocarcinomas at the apex of the bladder [18].

The standard treatment for urachal cysts typically involves excision of the cyst. Traditionally, an infected urachal cyst has been managed with a 2-stage approach, involving an initial incision and drainage of the infected cyst, followed by a secondary excision [19–21]. The best treatment approach for infected urachal cysts is still a matter of debate. According to Newman et al. [22], the use of proper antibiotics, immediate

complete cyst excision as the primary procedure is both feasible and safe in most cases.

Conclusion

Urachal anomalies are rare in adults and often go undiagnosed due to their nonspecific clinical course. Clinical presentation is often nonspecific, so a high level of suspicion is necessary for diagnosis. Misdiagnosis can lead to complications, including progressive infection and potential malignancy, making early detection crucial. Early diagnosis using several modalities such as ultrasonography and CT-Scan can help in planning appropriate surgical intervention, thereby reducing morbidity.

Patient consent

Before this case report and the accompanying images could be published, the patient's written informed consent had to be obtained. Upon request, a copy of the written consent may be reviewed by the journal's editor-in-chief.

CRedit authorship contribution statement

Basofi Sukiman: Conceptualization, Visualization, Supervision, Funding acquisition, Writing – review & editing, Project administration. **Leni Santiana:** Investigation, Data curation, Writing – original draft, Resources, Writing – review & editing, Project administration.

Ethical approval

No ethical clearance was required.

Author contribution

All authors participated in drafting and finalizing the manuscript.

Research registration

Not applicable.

Provenance and peer review

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Guarantor

The guarantor of this report is Basofi Sukiman.

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