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Urachal cyst as a rare case involving urinary bladder in adults: A case report

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Abstract
Urachal cysts are rare congenital anomalies that occur due to incomplete obliteration of the urachus, a structure present during fetal development connecting the bladder to the umbilicus. This case report discusses a rare presentation of an infected urachal cyst in a 21-year-old female, who presented with lower abdominal pain, increased frequency of micturition, and a cystic mass on imaging studies. The patient was treated with broad-spectrum antibiotics followed by surgical excision of the cyst. Histopathology revealed features consistent with a urachal cyst complicated by acute and chronic inflammation. Urachal cysts are often asymptomatic but can present with infection or even malignancy in later stages. Diagnosis is challenging due to non-specific symptoms, and imaging modalities such as ultrasound and CT are essential for identification. Surgical resection remains the definitive treatment, especially in cases of infection or recurrent symptoms.

Keywords: Urachal cyst, congenital anomaly, urinary bladder, infected urachal cyst, case report, surgical excision, urachal anomalies, histopathology, abdominal pain, imaging studies

Introduction

The urachus is a three layered allantois derived from embryologic remnant that develops before the fifth month of fetal development.

The primary role is to connect the dome of bladder with the umbilicus. By the 12th Week of gestation, this fibrous tube like structure is usually sealed off to form the median umbilical ligament. Proximal allantois extends up to the urogenital sinus and the remaining allantois is encircled by the umbilical cord, from which it emerges to form the urachus, a fibrous connection between the umbilicus and apex of bladder [1]. Postnatally, it extends and lies in the extra peritoneal cave of Retzius between the parietal peritoneum and the anterior abdominal wall. Depending on the location and degree of incomplete obliteration, the urachus can undergo five distinct variety of urachal anomalies. According to the latest figures, among the common UA forms stand congenital patent urachus(47%), urachal cyst (30%), umbilical urachal sinus (18%), vesico-urachal diverticulum(3%), and alternating sinus (7-10%), aspects extensively already treated by Wilson *et al*. [2]. Among them, urachal cyst is second most common after patent urachus [3]. Urachal cyst typically have along the course of urachal tract an extravesical location along the course of urachal tract. The intravesical location of urachal cysts is rare and of a recently recognized type of congenital urachal anomaly [4, 5] Metwali *et al*. [5] expanded the spectrum of anomalies by describing a distinct type of urachal cyst that protrude from the anterio-superior wall of the bladder in to the bladder lumen which is called intravesical urachal cyst. Urachal cyst can develop at any age. During normal development the Urachal anomalies are rare and are more frequently reported in children than in adults [6] with incidence of urachal cysts is one in 5000-150,000 in the adult and pediatric population [7, 8], with a ratio of 2:1 in males than the older counterparts, it occurs in 1.6% of children under the age of 15 and 0.063% of cases in adults [9]. Unfortunately, due to infectious and malignancy processes, if they do not resolves this might be the transition phase for the patients to become surgical candidates. Without complication, most anomalies are asymptomatic and found incidentally during abdominal surgery or radiographic studies. Umbilical remnants develop when the fetal bladder and allantois are partially or completely obliterated. The remnants found in neonates younger than six months usually resolve spontaneously without the need for surgery.

When urachal remnants present clinically, they often response as an inflammatory response to an underlying infection. Common presenting symptoms are similar to cystitis and include dysuria, hematuria, suprapubic pain/tenderness and/or urinary retention. Of note, indications of systemic infection are not necessarily present, such as fever or even leukocytosis. Interestingly, a urinalysis will likely yield unremarkable results; there may be no evidence of bacteriuria or pyuria and a culture will not show growth in most cases (more than 80%) [10]. This clinical complication contributes to the difficulty in making this crucial diagnosis. In case of urachal abscess patient can present fever, abdominal pain or tender infra umbilical mass. Urachal abscess is rare in adult population and clinical or imaging aspect are not specific.

Case Presentation

A 21year old female patient presented to General Surgery OPD of World College of Medical Sciences & Research and Hospital reported with chief compliant of pain and heaviness in lower abdomen along with pain, increased frequency of micturition from past two weeks. She had no previous symptoms of nausea, vomiting or fever. Her physical examination was normal.

Her lab investigations were as follows:

CBC
Hb-9.9g/dl
TLC-6.1x 10^9/L
Platelet count-354x 10^9/L
ESR-20.

Urine Examination:

Physical Examination
Colour-dark yellow
Appearance-clear
pH-6.5
Specific gravity-1.025.

Microscopic Examination
RBC-7-8 / HP
WBC-full field / HPF
Epithelial cells-2-3 /HPF
Crystals-NIL

Chemical Examination: Protein, Glucose, Urine bile salts, Nitrate, Urobilinogen, Bilirubin, ketone-NIL.

Viral Markers: HBsAg-non-reactive
HCV-non reactive
HIV-non reactive

Renal Profile: Blood urea-18 mg/ dl
S. sodium-139mEq/L
S. potassium-4.1 mEq/L

Blood Sugar: 78mg/dl

PT: 12.9 sec, **Control:** 13.5 sec, **INR:** 1.0

Ultrasound of whole abdomen

Revealed a well-defined cystic structure measuring 5.6x3.7 cm with peripheral echogenic wall and few incomplete echogenic septa and moving echoes seen within it showing no vascularity on colour Doppler just anterior to the anterior wall of urinary bladder?? Infected urachal cyst.

CECT Pelvis

Findings showed well-defined thick-walled cyst anterior to the urinary bladder suggestive of a urachal cyst with? secondary infection along with minimal fluid in pouch of Douglas fluid. Urinary bladder was partially distended with normal wall thickness.

Patient was treated for broad spectrum antibiotics for two weeks. after antibiotics course, the patient underwent the surgery included the removal of the infected urachal cyst with Pfannenstiel incision. Operative findings were that the infected cyst was present at dome of bladder containing near about 100cc of pus. Wall of cyst was thick and fibrosed with cyst of 6cm x 6 cm in size. Marked adhesions were present in the pelvis anteriorly to bladder and bladder was adherent in the pelvis. All adhesions were removed with complete excision of the cyst done and bladder was closed in two layers. After surgery patient remained on IV fluids, antibiotics and analgesics.

Histopathological Examination

Specimen sent to Department of Pathology with three grey brown soft tissue pieces measuring 5 x 2.5 x 1.5 cm, 3.5 x 1.5 x 0.9 cm, 2.5 x 2.5 x 2.6 cm. The report revealed urothelial lining with focal areas of ulceration. The underlying super epithelium and muscle showed congestive blood vessels and dense infiltration by numerous lipid laden foamy macrophages, Lymphocytes and occasional neutrophils. No Atypia noted suggesting the features of urachal cyst with superimposed acute on chronic inflammation.

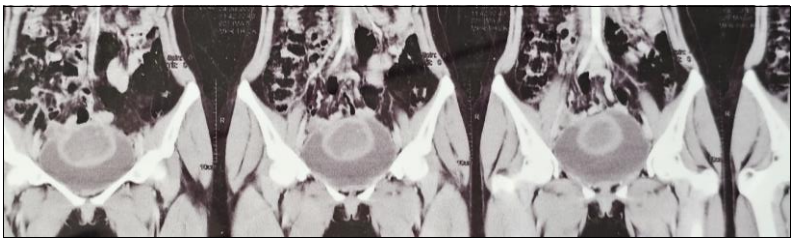

Fig 1 (A): CECT Pelvis-Coronal View

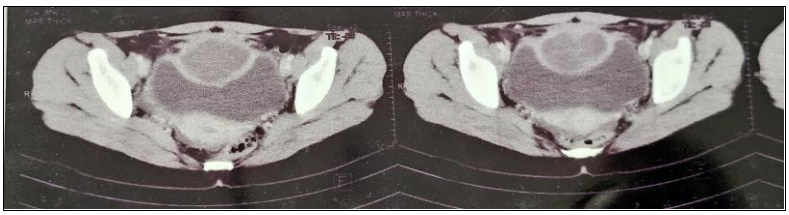

Fig 1 (B): CECT Pelvis-Axial View

Figure 1 (A& B)-CECT Pelvis-Well-defined thick-walled cyst anterior to the urinary bladder suggestive of a urachal cyst with ? secondary infection along with minimal pouch of Douglas fluid. Urinary bladder was partially distended with normal wall thickness.

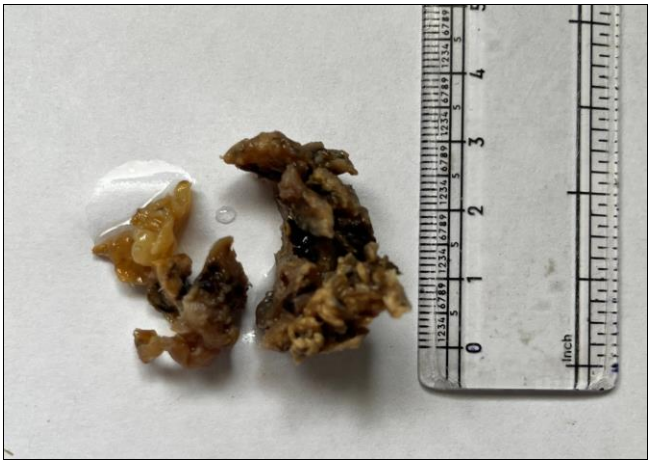

Fig 2: Post-operative excised cyst

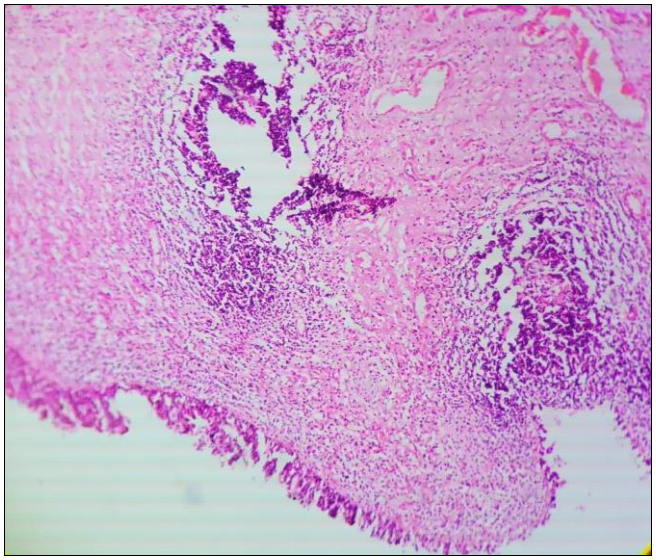

Fig 3: H&E (40x)-cyst lined with 5-6 layered uroepithelium, subepithelium showing lymphoid follicle formation

Discussion

There is broad differential diagnosis if a patient is to present clinically. The differential diagnosis includes but is not limited to urinary tract infection, hernia (umbilical and ventral), malignancy, hematoma, appendicitis, peritonitis, or a skin infection such as cellulitis or necrotizing fasciitis [11]. Certain genitourinary conditions may be associated with urachal cyst including vesicoureteral reflux, hypospadias, anal stenosis, and cryptorchidism [12, 13]. Congenital urachal anomalies are relatively uncommon [14, 15]. Urachal anomalies found incidentally due to wide spread use of imaging [14]. It should also be noted that even sophisticated imaging techniques may not be able to differentiate whether the urachal remnant is inflammatory or neoplastic in origin at the time of presentation. Frequency of malignant degeneration of urachal remnant increases with age and therefore eventual excision of the remnant is indicated [16]. Up to 25%or urachal cystic remnants may undergo malignant transformation to a highly aggressive urachal carcinoma with up to a 49% 5 year mortality rate [17] especially in elderly. Ultrasound is a primary imaging modality for urachal cysts. Ultrasound reveals cystic mass in midline bladder dome and umbilicus. CT and MRI helps to make a definite diagnosis. Most common complication of urachal cyst is infection of urachal cyst which may present with non-specific symptoms. On USG urachal remnant show complex echogenicity CT shows heterogeneous attenuation of content and contrast enhancement of the thick wall of cyst. CT is diagnostic test of choice to fully visualize the extent of cyst. It can be challenging to distinguish an infected urachal cyst from a malignant urachal neoplasm. The first documented primary urachal cancer was described in 1863 by Hue and Jacquin. Primary urachal cancer responsible for around 0.5% and 20-40%of bladder malignancies and adenocarcinoma [11, 18]. Two main strategies are there for the management of urachal cyst: conservative management and surgical management. Conservative management includes antibiotics, repeated USG and watchful waiting. Surgical management includes open exploration and laparoscopic and robotic approach. Mostly open surgical approach done which was gold standard in the past but now days laparoscopic and robotic approach is preferred which allows fast recovery. Children under one year of age should be kept on conservative line of treatment because there are chances of spontaneous resolution. In older children conservative management to be done for infected cyst with antibiotics. Surgery is definitive treatment. Surgery is must in cases with recurrent infection despite medical management. Recurrence occur due to incomplete resection therefore appropriate debridement of the infected tissue is required [19, 20].

Conclusion

Urachal cyst can occur at any age. Urachal cyst mostly remain asymptomatic. Symptoms occurs usually after complications. It is an uncommon illness with wide range of symptoms due to which difficult to diagnose. It is better to include urachal cyst in differential diagnosis.

Conflict of Interest

Not available

Financial Support

Not available

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