Case report

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Infected urachal cyst and acute appendicitis in a 1 year and 11 month old girl

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Abstract

Urachal anomalies are rare and their variable ways of presentation may represent a diagnostic challenge. The most common of these anomalies are urachal cysts. They are usually incidental findings and remain asymptomatic unless a complication (most commonly the infection) occurs. Infection of an urachal cyst would clinically present as abdominal pain associated to the signs and symptoms mimicking acute appendicitis. We present a case of a 1 year and 11 month old girl admitted for abdominal pain, vomiting and diarrhea. On the palpation of the abdomen the presence of a midline, tender tumoral mass was revealed. Ultrasonography and CT scans identified an infected urachal cyst and acute appendicitis. The particularities of this case were represented by the associated findings: acute appendicitis and infected urachal cyst, as well as the favorable evolution on conservative therapy.

Key words: urachal cyst, acute appendicitis, high resolution abdominal ultrasonography

Rezumat

Anomaliile de uracă sunt rare iar modalităţile variate de prezentare a acestora pot să pună probleme diagnostice. Dintre aceste anomalii cel mai frecvent întâlnit este chistul de uracă. Acesta este de obicei descoperit accidental, fiind asimptomatic, cu excepţia cazurilor în care apar complicaţii (cel mai frecvent suprainfecţie). Infecţia chistului de uracă se prezintă clinic sub forma de durere abdominală cu semne şi simptome ce sugerează diagnosticul de apendicită acută. In lucrarea de faţă, prezentăm un cazul unei fetiţe de 1 an şi 11 luni internată în clinica III Pediatrie pentru dureri abdominale, vărsături şi diaree. Palparea abdomenului aduce în plus ca element de diagnostic prezenţa unei mase tumorale dureroase situate subombilical, pe linia mediană abdominală, care la examinarea ultrasonografică şi CT este identificată ca fiind un chist de uracă suprainfectat. Particularităţile cazului sunt reprezentate de asocierea clinică a apendicitei acute şi a peritonitei precum şi a evoluţiei favorabile a cazului sub terapia medicamentoasă.

Cuvinte cheie: chist de uracă, apendicită acută, ultrasonografie abdominală

Introduction

The urachus is a median, tubular structure situated between the anterior portion of the urinary bladder dome and the umbilicus. During gestation, it connects the bladder and the allantoic duct. Normally, it transforms into a fibrous duct during embryologic development [1].

Urachal anomalies are globally characterized by the failure in closing up the urachal lumen. Approximately 33% of all individuals have to some extent a patent lumen of the urachus [2]. Clinical presentations of urachal anomalies include periumbilical leakage, pain, periumbilical mass and irritative voiding symptoms [1].

The most common urachal anomaly is the urachal cyst. It affects 1/5000 newborns, it is usually localized in the inferior third of the urachus and remains asymptomatic unless a complication occurs. The most common complication of an urachal cyst is infection [3].

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Abdominal high resolution ultrasonography and CT scans promptly identify the presence of such cysts. Their appearance and size may vary. Ultrasonography identifies a thin-walled cystic structure with transonic core, localized medially in the abdomen, immediately superior to the vesical dome. There is a possibility of communication between the urinary bladder and the abdominal wall and a voiding cystogram can exclude a communication with the bladder [4].

The association of infected urachal cysts with acute appendicitis and peritonitis is described in the international literature as the result of the rupture of the urachal cyst [5,6,7].

Case report

TA, a 1 y 11 mo old, female, with no relevant past medical history was transferred to the 3rd Pediatric Clinic of the LT Emergency Hospital for Children, presenting fever (39.8°C), loss of the appetite, pain in the right abdominal quadrant and pelvic region and pallor.

The onset of the present illness occurred 5 days prior admission, on the 17th of June 2009, when the child was admitted in another medical unit presenting fever, vomiting, and diarrhea. The treatment for the condition included Ampicillin, Metoclopramide and Hydrasec, with a favorable evolution of the enterocolitis but with no resolution of the fever, which became persistent and with a septic pattern. For this reason was decided the transfer in our clinic.

Upon admission the child was mildly agitated, with 38.6°C fever. Her skin was pale and she presented non-tender, lateral cervical adenopathy with small, mobile lymph nodes. There were no pathological findings on the clinical examination of the lungs. Her heart sounds were clear with a HR=130 bpm. She had a minor congestion of the pharynx. The abdomen was mobile with the respirations, mild tenderness spontaneously and on palpation in the right lowers abdominal quadrant and pelvic region with no rigidity of the abdominal wall. A tumoral mass was palpated immediately inferior to the umbilicus, tender on palpation, and approximately 4/4 cm in dimensions. The patient presented normal stools. Normal bowel sounds were heard on abdominal auscultation. Her liver and spleen were normal on palpation. Spontaneous diuresis was present with yellow colored, slightly turbid urine. CNS examination was normal.

Abdominal ultrasonography revealed normal aspects of the liver, pancreas, spleen and right kidney. A mildly distended pelvis of the left kidney was observed, with an anterio-posterior diameter of 1.1 cm. A midline tumoral non-homogenous mass, oval in shape, with an external capsule, well delimited from all other structures was observed immediately superior to the vesical bladder dome (fig 1a, fig 1b).

The dimensions of the tumoral mass were of 3.6/2.5 cm. The capsule of the tumoral mass presented hypervascularization on color Doppler examination (fig 2a, fig 2b).

The intestinal walls were thickened in the right and left flancks and the bowel loops distended. Inside one of the bowel loop there were at least 2 hyperechoic structures, 2-3 mm in diameter, with posterior shadowing. No peritoneal free fluid was observed.

Laboratory tests included: Leucocytes count: 37900/mm^3; Differential count: Neutrophiles: 55.4% (absolute value=21000/mm3); Lymphocytes: 27.4%; Monocytes: 15.6%; Eosinophiles: 1.3%; Basophiles: 0.3%; ESR=110

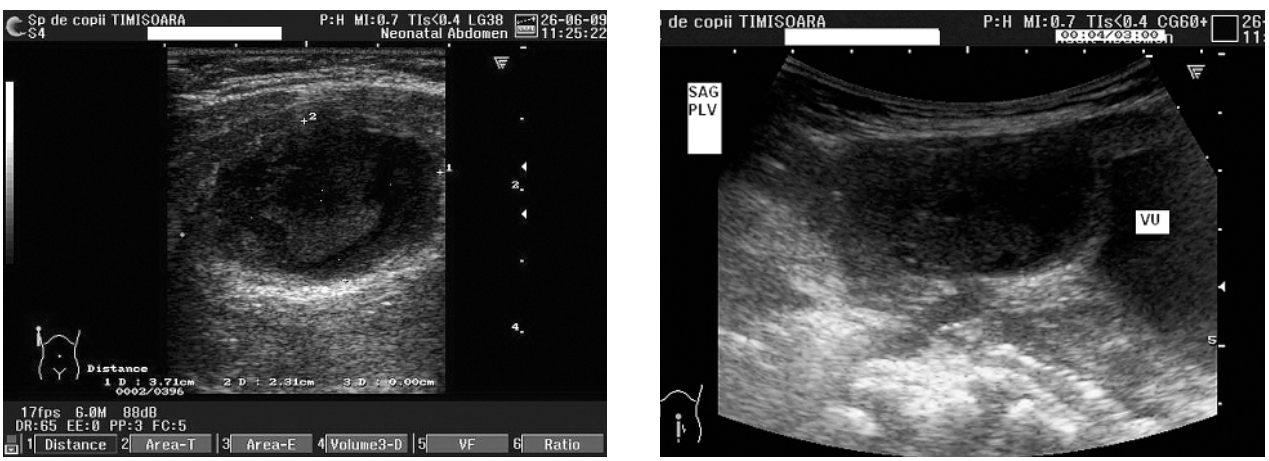


Fig 1. midline scan of the pelvis – Urachal cyst with thick walls and non-homogenous core in transverse *(a)* and longitudinal *(b)* midline scans of the pelvis

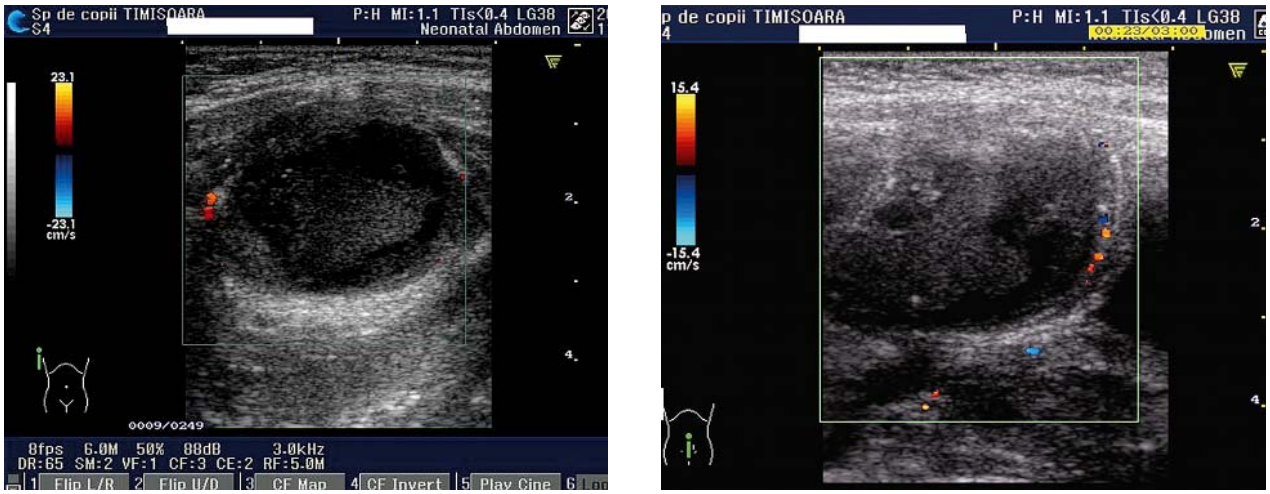


Fig 2. Color Doppler flow exacerbation in the walls of the urachal cyst transverse *(a)* and longitudinal *(b)* scans

mm/h; CRP=146.64 mg/l; Urine summary: albumins absent, sediment: 10-15 leukocytes/field, 2-3 erythrocytes/field, rare epithelial cells, round cells and bacteria; Uroculture: sterile; Serum proteins: 82.4g/l; electrophoresis: albumins: 40.7%; alpha1=6.9%; alpha2=17.8%; beta=11.8%; gamma=22.8%; Coproculture – negative

The treatment was initiated with broad spectrum antibiotics (Cephtriaxone and Gentamicine), anti-inflammatory therapy and antipyretic drugs.

Repeated abdominal US, 24h after the first examination, showed the same pathological findings. Additional findings included a small liquid collection in the right flank.

Abdominal CT performed 3 days after the second ultrasound examination revealed the presence of a tubular structure with thick walls and 2 calcifications inside, in the cecum-appendicular region (appendicitis with appendicoliths) (fig 3).

A cyst with a thick wall is observed on the median line anterior and superior of the urinary bladder (urachal cyst) (fig 4).

The clinical evolution of the patient was favorable, with complete resolution of the fever on day 7 after the initiation of the antibiotic therapy.

The **surgical consult** performed after the CT examination concluded that the illness was in resolution and at that moment did not require surgical intervention. Surgical recommendations included: further medical therapy up to 14 days and programmed the child for the surgical excision of the urachal cyst, afterwards.

Ultrasonography performed before the discharge of the patient (18 days after admission to the hospital), revealed the presence of a small transonic urachal cyst (fig 5), and no evidence of free peritoneal fluid or bow-



Fig 3. CT scan – appendicolite



Fig 4. CT scan – image of the urachal cyst

el inflammation. However, the appendicoliths was still present (fig 6).

Three weeks later, the surgical intervention was performed, with removal of the appendix and the urachal cyst.

Discussion

The incidence of a persistent urachal remnant varies within the literature. Recently, Ueno *et al*. [8] reported a screening ultrasound series of 3400 children and found a 1.6% rate of detected urachal anomalies; 71% were symptomatic.

The most common clinical presentation of an urachal anomaly is periumbilical drainage, followed by abdominal pain, periumbilical mass and urinary symptoms [1].

The most common urachal anomaly is represented by urachal cysts. They are usually asymptomatic unless a complication occurs. Among complications of the urachal cysts, the most common is the infection of the cyst.

Diagnostic success with ultrasonography has been reported in literature as high as 75-100% and other tests, such as computed tomography are usually not required [9]. A study conducted by Cilento *et al.* [10] reported that the ultrasound examination was diagnostic for 100% of urachal cysts, while a more recent study conducted by Yiee *et al.* [1] found ultrasonography to be diagnostic in 82% of cases. CT scan may be effective in differentiating this pathology from others, such as acute appendicitis, Meckel's diverticulitis or ovarian torsion [11].

Differential diagnosis of this condition includes anomalies of the vitelline ducts (such as Meckel's diverticulum), patent omphalo-mesenteric duct, infected umbilical vessel, appendicitis or omphalitis [1,12].

Urachal cyst treatment depends on the presence of complications or associated conditions. Non infected urachal cysts are usually removed in a single step surgical intervention which removes the entire lesion along with a small fragment of the bladder dome. This intervention is justified)by the fact that simple drainage is usually followed by reoccurrences and more important due to the association of urachal remnants with late malignant degeneration into adenocarcinoma, sarcoma or transition cell carcinoma. Such degenerations are rare, having been reported in only 1/5.000.000 cases [13]. In case of infection an antibiotic regimen is recommended prior to the surgical intervention.

As far as our case is concerned, the association of these 2 clinical entities: suprainfected urachal cyst and appendicitis has been rarely reported in the literature at such an early age. The favorable evolution of the case under medical therapy allowed us to postpone of the surgical intervention, which took place 3 weeks after the initial presentation of the patient. It involved the removal of both the appendix and the urachal cyst and it was uneventful. The sonographic and CT findings were relevant for the diagnosis and repeated ultrasound evaluation confirmed the good evolution of the patient under medical therapy, thus having a decisive role in the management and outcome of this case.



Fig 5. US image of the infected urachal cyst



Fig 6. US image of the appendicolite (arrow)

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