Massive pyuria as an unusual presentation of giant infected urachal remnant in a child

Mirko Bertozzi[a], Alberto Verrotti[b], Giuseppe Di Cara[b], Sara Riccioni[c], Victoria E. Rinaldi[b], Elisa Magrini[a] and Antonino Appignani[a]

Urachal remnants (URs) are manifestations of an incomplete regression of the urachus; therefore, there may be different types of remnants such as cyst, sinus tract, diverticulum or patent urachus. The clinical presentation of a urachal anomaly includes umbilical discharge, lower abdominal pain and urinary tract infection, although a UR may also be asymptomatic. We present the case of a 2.5-year-old girl who presented with abdominal pain, stranguria and massive pyuria in which a giant infected UR was found. The diagnosis was made using abdominal MRI. The child was subjected to laparoscopic-assisted drainage and had an uneventful postoperative course. *Ann Pediatr Surg* 11:244–246 © 2015 Annals of Pediatric Surgery.

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[a]S.C. di Clinica Chirurgica Pediatrica, [b]S.C. di Clinica Pediatria and [c]Sezione di Radiologia 2, S. Maria della Misericordia Hospital, University of Perugia, Perugia, Italy

Correspondence to Mirko Bertozzi MD, S.C. di Clinica Chirurgica Pediatrica, S. Maria della Misericordia Hospita, Perugia University, Loc. S. Andrea delle Fratte, 06100 Perugia, Italy
Tel: +39 075 5786451; fax: +39 075 578 3376;
e-mail: mirkobertozzi@hotmail.com

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Introduction

Urachal remnants (URs) are manifestations of an incomplete regression that may occur at various levels of the urachus; therefore, there may be different types of remnants such as cyst, sinus tract, diverticulum or patent urachus [1]. Clinical presentation of a urachal anomaly includes umbilical discharge, local infection, lower abdominal pain and urinary tract infection, although a UR may also be asymptomatic [2,3]. The definitive preoperative diagnosis may be difficult to make because patients may have nonspecific symptoms. Complete excision is advised in case of persistent symptomatic remnants, but is also advised by some authors in asymptomatic patients due to the associated risk of malignant degeneration [4].

Case report

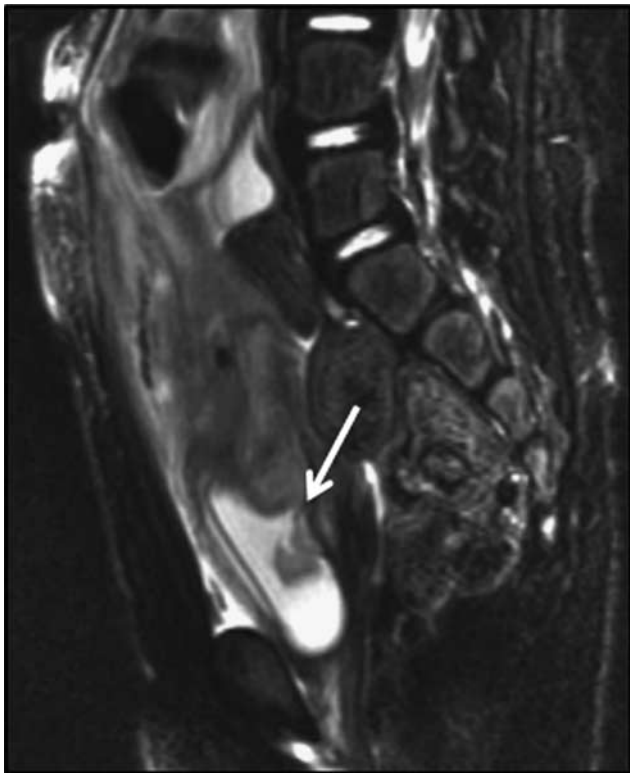
A 2.5-year-old girl presented with a 5-day history of abdominal pain and stranguria. These symptoms appeared after an upper airway infection with otitis and fever, which was treated with a 6-day course of amoxicillin and apparently resolved.

At admission, the girl was in good general conditions. Abdominal pain was localized at lower abdominal quadrant level with exacerbation during micturing. Physical examination showed painful palpation of the lower abdomen with muscle guarding. Upper and lower airway examination was normal. Laboratory results showed the following: white cell count, 21.76×10^3; neutrophils, 63.9%; and C-reactive protein, 0.2 mg/dl. Liver and kidney function was normal. A urinary catheter was inserted for stranguria and to collect urine sample for analysis and urine culture, with evidence of massive pyuria.

An abdominal ultrasonography (US) performed at admission revealed the presence of a suspected giant urachal abscess just over the bladder dome; this finding was then confirmed with an MRI, which revealed the presence of an infected UR, extending from the umbilicus to the bladder dome with a urachovesical fistulization (Fig. 1).

The child was subjected to laparoscopic-assisted drainage of the urachal abscess. After antibiotic treatment, the patient fully recovered and was discharged 3 days postoperatively. Results of urinalysis revealed the pre-

Fig. 1



MRI image of infected giant urachal remnant. Arrow shows the urachovesical fistulization.

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sence of *Staphylococcus aureus*. US follow-up was scheduled after the drainage at 3, 6 and 12 months. Despite the reduction in size (Fig. 2), the persistence of remnant led us to the decision of laparoscopic excision of the remnant in all its length [5] (Fig. 3). During the intervention for the remnant excision, a right herniorrhaphy was also performed [6]. Informed consent was obtained from parent's patient.

Discussion

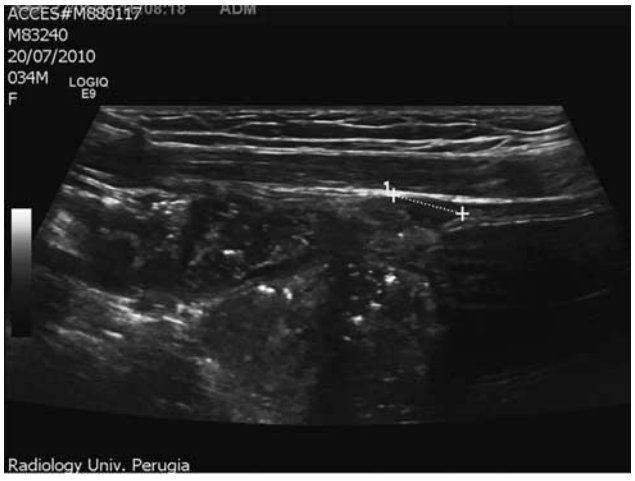
URs are rare abnormalities (1 : 5000 live birth) [7] caused by an incomplete regression of the embryonic urachal duct that may occur at various levels, being often diagnosed incidentally during US examinations performed for different reasons. URs may become symptomatic when infected, causing acute abdominal pain [8], often mimicking the more common causes such as periappendiceal or ovarian abscesses or Meckel's diverticulitis [9].

Other clinical presentations of URs include omphalitis, umbilical spillage and recurrent urinary tract infections [10]. Pyuria is the presence of an abnormal number of white blood cells in the urine. Massive pyuria, as evidenced in our patient, is an uncommon feature never related to URs. Indeed, the most common cause of white blood cells in the urine is due to an infection of the urinary system. In children, when a urinary tract infection is excluded, differential diagnosis should include polycystic kidney disease, drug-induced nephritis, tuberculosis, Alport syndrome, renal calculi and Kawasaki disease and others [11,12]

In our patient, the absence of fever and the negative C-reactive protein after 5 days of symptoms was not consistent with a suspicion of bacterial urinary tract infection. Normal renal function and history excluded interstitial nephritis. US, initially performed to assess the presence of calculi or renal malformations, lead to the unexpected diagnosis.

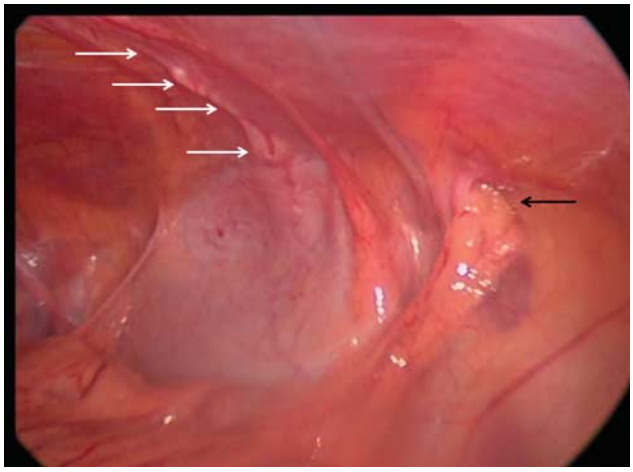
US is usually appropriate for confirming the diagnosis of URs [13], but sometimes MRI or computed tomography is indicated only in difficult cases, especially in adults.

Fig. 2



Ultrasonographic image at 12 months from the drainage of the infected urachal remnant shows a reduction in size.

Fig. 3



Laparoscopic image of the urachal remnant: white arrows show the urachal remnant in all its length. Black arrow shows the open right internal inguinal ring with omentum inside.

Although micturating cystourethrogram may be required to rule out distal obstruction, especially in male patients, in addition to US, in our case, both for sex, age, clinical history and the evidence of clinical features, this diagnostic examination was not considered necessary.

Treatment is primarily surgical, because UR removal prevents recurrent infections and possible malignant degeneration reported in paediatric age group [10,14,15].

Traditionally, excision of the URs was performed by means of lower midline or hypogastric transverse incision but in the last 10 years laparoscopic removal has become more frequent [2,3,16,17].

Although the initial stage of drainage of infected URs can be carried out percutaneously with or without US or computed tomography guidance, in this patient we preferred a laparoscopic-assisted drainage of the urachal abscess because when grossly infected, URs can rupture into the peritoneal cavity causing peritonitis. With laparoscopic drainage of urachal abscesses, it is possible to check a possible peritoneal contamination and to perform a peritoneal toilette if necessary [5]. As seen in this patient, infected URs can be easily managed by a staged laparoscopic intervention.

Conclusion

URs are rare congenital anomalies. Excision of URs is advised to prevent possible future malignant degeneration or recurrent infection. In case of infected UR, as in our patient, a staged laparoscopic excision proved to be a good choice. URs should be added to the differential diagnosis of acute abdominal pain in the presence of pyuria in paediatric patients.

Acknowledgements

Conflicts of interest

There are no conflicts of interest.

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