



Perivesical abscesses caused by *Staphylococcus aureus* in two children



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ABSTRACT

We present two children with abscesses located adjacent to the urinary bladder without a demonstration of intestinal pathology. The abscesses were caused by *Staphylococcus aureus* and were successfully treated with computerized tomography-guided drainage and antimicrobials. We would like to stress that not every abdominal abscess is secondary to bowel disease or perforation. Therefore, the organisms cultured may differ from the classic mixed gut flora. Hence, especially if there is no evidence of intestinal disease and the location is not typical for intestinal pathology (e.g., perivesical), *S. aureus* must be considered a potential etiologic factor.

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Intra-abdominal abscesses are infrequent in the pediatric population. They often occur as a complication of local or generalized peritonitis, commonly secondary to appendicitis, necrotizing enterocolitis, pelvic inflammatory disease, surgery or trauma [1]. The microbiology of intra-abdominal abscesses is usually polymicrobial, and reflects that of the intestinal flora [2,3]. We hereby present two children with intra-abdominal abscesses without intestinal pathology; the abscesses were caused solely by *Staphylococcus aureus* and were located adjacent to the urinary bladder.

1. Child 1

A previously healthy 14-month-old boy was seen at the pediatric emergency department (ED). He had had fever up to 39.3 °C for most of the previous 3 weeks despite being treated with amoxicillin for a positive throat culture for *Streptococcus pyogenes*. He was also restless,

but there were no other symptoms. A day before his admission he had watery diarrhea without blood or mucous and he vomited once.

On physical examination he was alert and oriented and did not look ill. His temperature was 37.4 °C, pulse was 100/min and blood pressure was 90/60 mm Hg. The abdomen was soft but tender mostly at the lower abdomen; there was normal peristalsis with no hepatosplenomegaly. The rest of his examination was normal.

Laboratory evaluation revealed a leukocyte count of 26,000 cells/mm³, of which 86% were neutrophils, the hemoglobin was 8.1 g/dL and there were 860,000 platelets/mm³. The serum electrolytes, renal function tests, liver enzymes and amylase were normal. Urinalysis was normal. An abdominal ultrasound (US) demonstrated a multilocular collection in the pelvis on the right (Fig. 1A). The collection was located next to the urinary bladder wall on the right, without a visible appendix. Free turbid abdominal fluid and diffuse increased echogenicity of the mesenteric fat were also noted.

The initial working diagnosis was an intra-abdominal abscess, probably periappendicular. Treatment was begun with intravenous ampicillin, gentamicin and metronidazole. An abdominal computerized tomography (CT) with oral and intravenous contrast was done and demonstrated intraperitoneal abscess cranial to the urinary bladder and turbid peritoneal fluid (Fig. 1B). A normal-looking appendix was demonstrated. The abscess was percutaneously drained under CT guidance.

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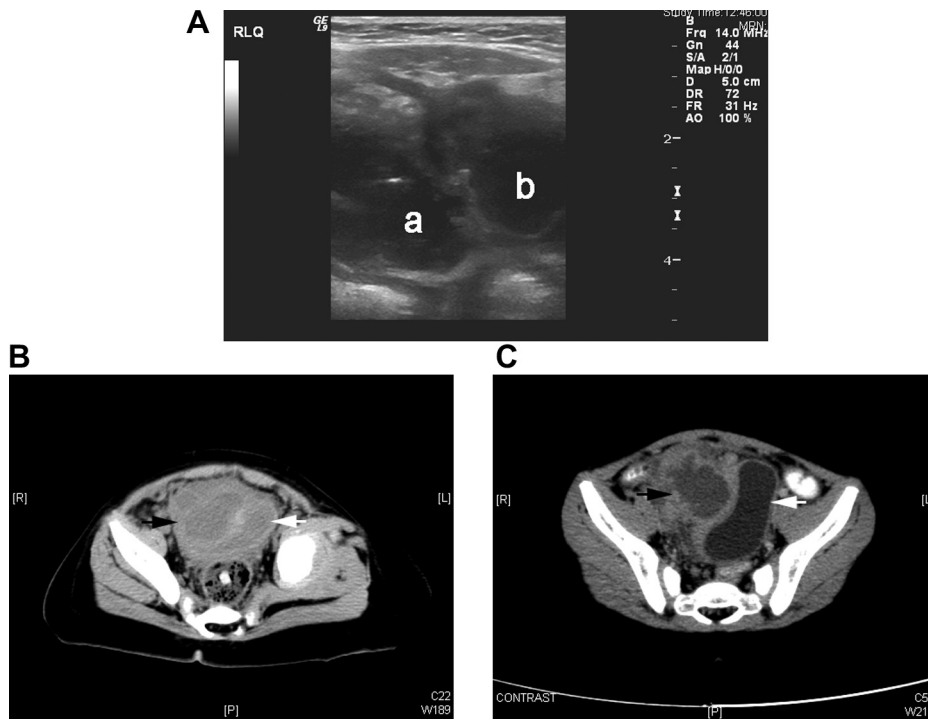


Fig. 1. A: An abdominal ultrasound demonstrating a multilocular collection (a + b) in the right pelvis, measuring 3 × 4.5 cm with echogenicity of the surrounding fat. B: A contrast media CT of the pelvis showing a right multilocular abscess compressing the urinary bladder (black arrow – abscess; white arrow – urinary bladder). C: A contrast media CT of pelvis showing an abscess on the right, compressing the urinary bladder (black arrow – abscess; white arrow – urinary bladder).

Direct microscopy of the aspirated fluid revealed gram positive cocci. The antibiotic regimen was changed to vancomycin, gentamicin and clindamycin. He also received packed red blood cells due to symptomatic anemia.

A blood culture which was drawn on admission and the abscess aspirate culture grew *S. aureus* susceptible to methicillin and clindamycin. The antibiotic treatment was changed to cefazolin and clindamycin. An echocardiography was performed; it showed a normal heart anatomy and function without vegetations. Repeat blood cultures were sterile as was the urine culture.

On the 4th day of admission the drain was removed. On the 5th day the C-reactive protein (CRP) level was 100 mg/L (normal range up to 8 mg/L). The child's respiratory and hemodynamic condition returned to normal. The fever, however, persisted. His abdomen was tender and pain was noticed especially prior to and during defecation. Thus, a repeat US was performed on day 8 of hospitalization. It showed 2 attached collections in the mid-lower abdomen, to the right of the midline, each measures about 1.5 × 2 cm. A third, slightly larger collection was seated deeper in the pelvis, anterior to the urinary bladder. A repeat CT was performed in the following day (9th hospitalization day). It demonstrated multiple small abscesses in the upper and lower abdomen between the bowel loops. At this time the child defervesced, was less irritable, and the CRP level decreased to 84 mg/L. A decision was made to continue the same antibiotics without surgical drainage of the abscesses, assuming the abscesses were either spillage from the drainage of the first abscess or organization of the peritoneal turbid fluid seen before.

The child's condition continued to improve. Repeat US examinations demonstrated decreasing volume of the abscesses. The child was discharged on day 21 of hospitalization without fever or pain and with a normal CRP and blood count. He received additional 3 weeks of oral antibiotics (initially cephalexin and clindamycin followed by cephalexin). Repeat US 6 weeks after his admission showed the disappearance of the abscesses. Because of

the severe unusual infection an immunological workup was done: Human immunodeficiency virus serology was negative, immunoglobulin levels (IgG, IgA, IgM) were normal (including adequate post-vaccination levels against measles, mumps and rubella), and neutrophil function (including chemotaxis, oxidation and bactericidal activity) was normal. The blood staphylococcal isolate was submitted to the Israeli *S. aureus* Central Laboratory and was found to be Pantone–Valentine leukocidin (PVL) negative by polymerase chain reaction. Currently, over 2 years after his hospitalization, the child's medical and developmental status is normal for his age.

2. Child 2

A previously healthy 3.5-year-old boy presented to the ED with 7 days of dysuria and 2 days of fever. His medical history was remarkable only for air enema reduction of intussusception at 6 months of age. His temperature was 37.2 °C and the abdomen was noted to be soft but tender in the lower region without signs of peritonitis.

Blood count demonstrated mild leukocytosis (16,000 cells/mm³) with 66% neutrophils and microcytic anemia (hemoglobin 10.5 g/dL) with normal platelet count (413,000/mm³). Urinalysis revealed 2–3 red blood cells/mm³. CRP was 103 mg/L (normal range up to 5 mg/L).

A localized inflammatory process in the pelvis was seen by US. Abdominal CT revealed an abscess 4.5 cm in diameter, adjacent to the urinary bladder on the right (Fig. 1C). It also showed a normal-looking appendix.

The abscess was drained percutaneously, guided by CT. Culture of the drained pus grew *S. aureus* susceptible to methicillin and clindamycin. The boy was treated initially with ampicillin, gentamicin and clindamycin which were changed to cefazolin according to the culture result. Blood and urine cultures were negative. The abscess decreased in size, and the symptoms resolved. CRP on

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