Int Surg 2024;**107–108:**23–26
DOI: 10.9738/INTSURG-D-22-00003.1

Case Report

Abscess Formation of Abdominal Wall Mimicking Lymphoma Due to *Morganella morganii* Infection in a Prepubescent Child

Shuo Dong, Guanghua Pei

Department of Ultrasound, Tianjin Children's Hospital/Tianjin University Children's Hospital, Tianjin, China

Introduction: *Morganella morganii* infection mainly occurs in elderly people and immunocompromised patients; however, an abdominal wall abscess due to *M morganii* infection in prepubertal children has not been documented.

Methods: Our presented case is a 4-year-old male patient with a 1-month history of left lower quadrant abdominal mass. Preoperative ultrasonography showed a hypoechoic, heterogeneous mass and the mass was not just confined to the abdominal wall, mimicking lymphoma. On color Doppler flow imaging, an image of a highly vascularized mass was demonstrated. The patient underwent lump resection of the abdominal wall. Postoperative process was uneventful except for intermittent hematuria and bladder sludge and urethral calculus on ultrasonography. With symptomatic treatment, hematuria disappeared and urethral calculus and bladder sludge decreased. Then the patient was discharged home.

Results: Postoperative histopathology and immunohistochemistry were suggestive of abscess formation and *M morganii* was isolated finally from the aspirated pus.

Conclusion: Although an abdominal wall abscess due to *M morganii* infection is rare, it should not be absent in the differential diagnosis of abdominal wall masses in children. Imaging features of abdominal wall masses should closely integrate the pertinent clinical history.

Key words: Abdominal wall – Abscess – Children – Ultrasound – *Morganella morganii*

Many different lesions and masses may affect the abdominal wall; however, abdominal wall masses are uncommon in the pediatric age group, including abscess, hematoma, lymphoma, and

Corresponding author: Shuo Dong, Tianjin Children's Hospital/Tianjin University Children's Hospital, No. 238, Longyan Road, Beichen District, Tianjin 300134, China.
E-mail: dongshuo365@163.com

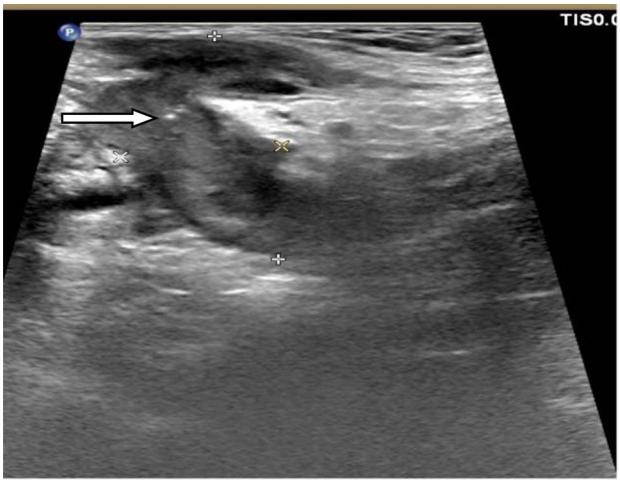

Fig. 1 Longitudinal grayscale sonogram of the abdominal wall mass showed an irregular hypoechoic mass, heterogeneous, partly patchy hyperechoic with acoustic shadowing (arrow), immobile, situated between the left lower abdominal wall and left side wall of the bladder, penetrating the abdominal wall muscles.

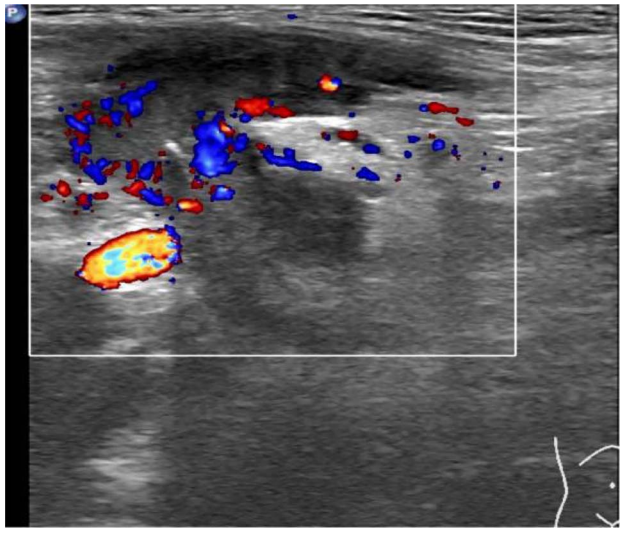

Fig. 2 Color Doppler sonogram of the abdominal wall mass. On CDFI, an image of highly vascularized mass was demonstrated.

parasitosis. Among those, benign conditions are preponderant, mostly of infectious origin.[1,2] In 4 pediatric patients with abdominal wall abscess, *Staphylococcus aureus* and *Staphylococcus haemolyticus* infections were the most common.[1]

Morganella morganii is an opportunistic infectious pathogen that normally exists in the environment and intestinal tracts of humans. The *M morganii*–associated infection mainly occurs in elderly people and immunocompromised patients. Although uncommon, this pathogen can cause diverse infectious diseases, mainly sepsis, abscess, and urinary tract infection (UTI).[3,4]

However, an abdominal wall abscess due to *M morganii* infection in prepubertal children has not been documented. Here, we report a case of a 4-year-old male patient with abscess formation of the left lower abdominal wall caused by *M morganii* infection, which mimicked lymphoma on preoperative ultrasonography.

Case Report

A 4-year-old male patient was hospitalized due to a 1-month history of left lower quadrant abdominal mass. He had fever and left lower abdominal pain during the previous 1 month. Three weeks before admission, swelling and tenderness appeared, and no fever. After local anti-inflammatory treatment, the mass contracted but did not disappear. His prior surgical procedures included a high ligation of left inguinal indirect hernial sac 3 years before. His parents denied other trauma and surgical history. Physical examination disclosed a hard ill-delimited mass, poorly movable, tender, not fluctuating on palpitation, and measuring about 5 cm × 4 cm × 2 cm.

High-resolution ultrasonography was performed using a Philips EPIQ5 ultrasound system and L12-5 50-mm broadband linear array transducer (Philips Ultrasound, Bothell, Washington). Ultrasound showed an irregular hypoechoic mass, heterogeneous, partly patchy hyperechoic with acoustic shadowing, immobile, situated between the left lower abdominal wall and left side wall of the bladder, penetrating the abdominal wall muscles. On color Doppler flow imaging (CDFI), an image of a highly vascularized mass was demonstrated (Figs. 1 and 2). The surrounding soft tissues were edematous and echogenic. On magnetic resonance imaging scans of the abdomen and pelvis, the mass appeared mildly heterogeneous, with long T1 and T2 signals, measuring 5.7 cm × 4.2 cm × 1.6 cm. After the administration of contrast media, the mass markedly attenuated. Routine blood tests were all within normal ranges and the chest X-ray showed no abnormality.

The patient underwent lump resection of the abdominal wall. Intraoperative findings showed that the mass was situated between the internal oblique and transverse muscles of the abdomen, was dumbbell-shaped, infiltrating adjacent muscles at one end and tightly adhesive to the peritoneum at the other

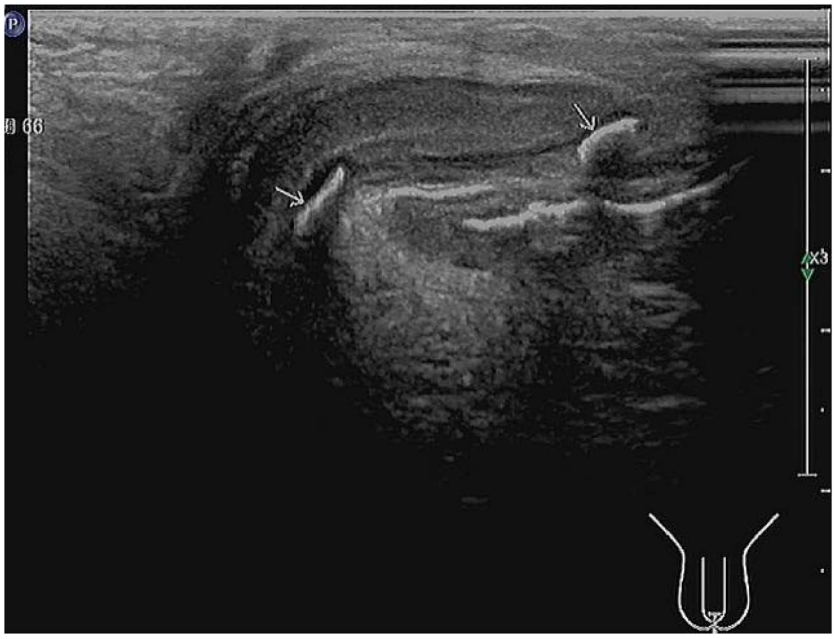

Fig. 3 Longitudinal gray-scale sonogram of the penis demonstrated 2 urethral calculi with posterior shadow (arrows), 4.5 mm in length (the bigger one), situated next to the external orifice of the urethra and 21 mm proximal to the external orifice of the urethra, respectively.

end, was not encapsulated, and had dark brown necrotic tissue within it. During the operation, the frozen section diagnosis of the specimen was not suggestive of tumor occurrence. The mass and adjacent infiltrative tissues were both incised and sent to the pathologist. The aspirated pus was used for bacterial culture and drug sensitivity test. Before isolation of the pathogen, the patient was administered latamoxef, which has an antibacterial spectrum similar to Cefotaxime (a third-generation cephalosporin). The patient's postoperative course was uneventful except intermittent hematuria. Ultrasonography demonstrated bladder sludge and 2 urethral calculi with posterior shadow, 4.5 mm in length (the bigger one), situated next to the external orifice of the urethra and 21 mm proximal to the external orifice of the urethra, respectively (Fig. 3). By symptomatic treatment, hematuria disappeared and urethral calculus and bladder sludge decreased. Then the patient was discharged home. Final histopathology and immunohistochemistry showed reactive tissue with necrosis and granuloma formation. *M morganii* was isolated from pus culture and was sensitive to a range of antibiotics including cefotaxime.

Discussion

M morganii is a gram-negative facultative anaerobe, which was first isolated in 1906 by Morgan et al[5] from a pediatric fecal culture. Despite its wide distribution in the environment and the intestinal tracts of humans, it has been considered an uncommon cause of human infections; however, this pathogen can cause diverse infectious diseases, mainly sepsis, abscess, and UTI. Several risk factors may be involved in *M morganii* infection, including old age, presence of concomitant bacteremia, hospitalization, recent surgery, and concurrent antibiotic use. Some animals also can transmit *M morganii* to persons and cause infections through bites or scratches.[3,4]

Although a rare cause of abscess formation, *M morganii* can cause abscess in war wounds, orbit, liver, tumor, central nervous system, and the urogenital system.[4] Vijaya et al[6] reported a recurrent abscess of the anterior chest wall caused by *M morganii* infection in a 17-year-old female college student. However, an abdominal wall abscess due to *M morganii* infection in prepubertal children has not been documented. *Staphylococcus aureus* and *Staphylococcus haemolyticus* was the common pathogen in pediatric patients with abdominal wall abscess.[1] Our presented case is a 4-year-old male patient with a 1-month history of left lower quadrant abdominal mass. Postoperative histopathology and immunohistochemistry were suggestive of abscess formation and *M morganii* was isolated finally from the aspirated pus. Three years ago, our patient underwent a high ligation of the left inguinal indirect hernial sac, and always had a cat in the home. However, it is unclear whether the abdominal wall abscess due to *M morganii* infection was associated with prior surgery, animal contact, or other risk factors.

The abdominal wall may be involved by lymphoma, which could appear as a palpable mass clinically.[7] Bozas

et al[7] reported a highly vascularized heterogeneous mass with lobular margins situated between the abdominal muscles on ultrasonography. As we know, the development of soft tissue lymphoma and infection both have been associated with prior injury or surgery, and infection itself could be involved in the development of lymphoma. Infectious agents, such as *Helicobacter pylori* and the bacillus *Tropheryma whipplei*, contribute to the pathogenesis of different cancers, including lymphoma.[8] Both lymphoma and infection in the abdominal wall may present with a hypoechoic, heterogeneous mass and often poses a diagnostic dilemma for the sonographer. In our case, preoperative ultrasonography showed a hypoechoic, heterogeneous mass and the mass was not just confined to the abdominal wall. The nature of this abdominal wall mass could not be determined as infection with certainty before the operation.

UTIs are common infections associated with considerable morbidity and mortality, especially in pediatric patients. Although UTI is probably the most common infection caused by *M morganii* in humans, *M morganii*–associated UTIs are rare in children. In 1 study, 221 urinary isolates were identified in the urine cultures of 218 children with UTI, including only 2 *M morganii*.[9] Falagas et al[10] reported that *M morganii* caused pyelonephritis in 3 pediatric patients, all of whom were younger than 4 years old. In another study, of the 38 species of micro-organisms isolated from 33 of 70 renal stones, *M morganii* associated with only 1.[11] However, owing to lack of urine culture, it is uncertain whether *M morganii* caused urinary infection and urethral calculus in our case.

Therefore, although abdominal wall abscess due to *M morganii* infection is rare, it should not be absent in the differential diagnosis of abdominal wall masses in children. Imaging features of abdominal wall masses should closely integrate the pertinent clinical history.

Acknowledgments

No conflict of interest exits in the submission of this manuscript, and the manuscript is approved by both authors for publication. I would like to declare on behalf of my co-author that the work described was original research that has not been published previously, and is not under consideration for publication elsewhere, in whole or in part.
Thanks for funding by Tianjin Key Medical Discipline (Specialty) Construction Project.

References

1. Khajavi A, Zarabi M. Abdominal wall masses in children. *Clin Radiol* 1972;**23**(4):495–499.
2. Souza AMDES, Barbuto TM, Freitas FA, Vianna NF, Zanchetta CMC, Forsait S *et al*. An unusual abdominal wall mass in a child. *Rev Inst Med Trop Sao Paulo* 2017;**59**:e16.
3. Lin TY, Chan MC, Yang YS, Lee Y, Yeh KM, Lin JC *et al*. Clinical manifestations and prognostic factors of *Morganella morganii* bacteremia. *Eur J Clin Microbiol Infect Dis* 2015;**34**(2):231–236.
4. Liu H, Zhu J, Hu Q, Rao X. *Morganella morganii*, a non-negligent opportunistic pathogen. *Int J Infect Dis* 2016;**50**:10–17.
5. Morgan Hde R. Report CII. Upon the Bacteriology of the summer diarrhoea of infants: [Second Communication]. *Br Med J.* 1907; **2**(2427):16–19.
6. Vijaya D, Sathish Jv, Yashaswini Mk, Sulaiman S. *Morganella morganii* causing abscess over the anterior chest wall—a case report. *J Clin Diagn Res*. 2014;**8**(9):DD03.
7. Bozas G, Anagnostou D, Tassidou A, Moulopoulos LA, Bamias A, Dimopoulos MA. Extranodal non-Hodgkin's lymphoma presenting as an abdominal wall mass. A case report and review of the literature. *Leuk Lymphoma* 2006;**47**(2):329–332.
8. Masrour-Roudsari J, Ebrahimpour S. Causal role of infectious agents in cancer: an overview. *Caspian J Intern Med* 2017;**8**(3): 153–158.
9. Mantadakis E, Vouloumanou EK, Panopoulou M, Tsouvala E, Tsalkidis A, Chatzimichael A *et al*. Susceptibility patterns of uropathogens identified in hospitalised children with community-acquired urinary tract infections in Thrace, Greece. *J Glob Antimicrob Resist* 2015;**3**(2):85–90.
10. Falagas ME, Kavvadia PK, Mantadakis E, Kofteridis DP, Bliziotis IA, Saloustros E *et al*. *Morganella morganii* infections in a general tertiary hospital. *Infection* 2006;**34**(6):315–321.
11. Dewan B, Sharma M, Nayak N, Sharma SK. Upper urinary tract stones & *Ureaplasma urealyticum*. *Indian J Med Res* 1997; **105**:15–21.