

Pyometra in an 8-year-old prepubertal girl without congenital malformities, a case report

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Abstract

Pelvic inflammatory disease is an inflammation of the upper genital tract, mostly presenting in sexually active woman. Pyometra, a pus collection in the uterine cavity which cannot be drained, can occur in woman with PID. An 8-year-old girl presented with persisting fever, weight loss and abdominal pain. Clinical examination showed an abdominal mass. Computed Tomography suggests a pyometocolpos. Gynecological infections should be included in the differential diagnosis of abdominal pain with fever in young girls. Thorough clinical examination, sampling and sufficient imaging should be included. Treatment of Pyometra exist off parenteral broad-spectrum antibiotics and if necessary chirurgical drainage.

Introduction

Pyometra, or the accumulation of pus in the uterus due to cervical occlusion or stenosis is a rare condition, primarily affecting postmenopausal women. In younger women and children, factors such as hypoestrogenized endometrium, cervical stenosis, and exposure to transient bacteremia are more likely to cause obstruction and accumulation of pus (1). The incidence of pyometra in the general population is 0,2% (1).

Pelvic inflammatory disease (PID) is, by definition, an inflammation of the upper genital tract involving any or all of uterus, fallopian tubes or ovaries and the term is by convention reserved for sexually transmitted micro-organisms.

Although pyometra is a form of PID, it can be caused by non-sexually transmitted organisms (2). In 85% of PID cases, sexually transmitted bacteria, such as *Chlamydia trachomatis* and *Neisseria gonorrhoeae*, are responsible. The remaining 15% are caused by other cervical (e.g. *Mycoplasma genitalum*), respiratory (e.g. *Streptococcus pneumoniae*), or gastrointestinal (e.g. *Escherichia coli*) pathogens (2). PID is most common in sexually active adolescent females, particularly in the 15-25 age group (2).

In 2015, one case was published by Barry et al., together with a review of 12 other cases from 1948 to 2015 (1). The average age of these patients was 9 months, except for one 12-year-old with anorexia nervosa. In only 4 cases could the causative pathogen be identified. Three infants had an *E. coli* infection and one had a *Pseudomonas infection* (1). Since 2016, only two cases have been found in the literature: a prepubertal girl with pyometocolpos due to congenital vaginal agenesis and another 8-month-old African girl with recurrent pyometra (3, 4).

Thus, there are only 15 published cases of pyometra in children since 1948 (1, 3, 4). The present case represents the first Belgian prepubertal girl diagnosed with pyometra without congenital anomalies.

It is essential to diagnose pyometra promptly, as increased intrauterine pressure can cause pus to be drained through the fallopian tubes, potentially leading to peritonitis (1).

Case

An 8-year-old prepubertal girl with no significant family or personal medical history was admitted to the pediatric ward after experiencing fever for nine days, a 12% weight loss, and abdominal pain for 11 days, accompanied by occasional vomiting and bloody diarrhea. The girl had initially consulted her general practitioner after two days of fever, where a urine dipstick revealed hematuria. The diagnosis of urinary tract infection was withheld and she was subsequently treated with oral amoxicillin. However, despite the antibiotic therapy, her fever persisted for another seven days. She then consulted the pediatrician.

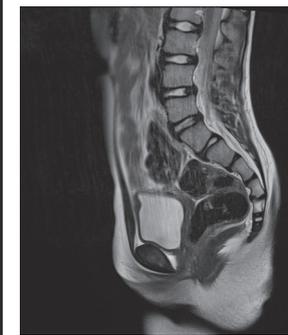
On admission, clinical findings revealed an uncomfortable, prepubertal girl with a tender, swollen abdomen and a palpable mass in the hypogastric region. External vaginal examination showed no signs of trauma or infection. No significant cardiac, respiratory, or neurological findings were noted, and vital parameters were stable, except for the persistent fever.

Laboratory tests showed elevated inflammatory markers with a C-reactive protein of 425 mg/l (<5 mg/l) and a mild leukocytosis of $16,83 \times 10^9$ th /L leucocytes ($4-10 \times 10^9$ th /L) with $12,96 \times 10^9$ th/L neutrophils ($1-9 \times 10^9$ th/L). Platelets were also elevated to 647×10^9 th/L (150-350 x

Figure 1: CT scan of the patient at presentation.



Figure 2: MRI of the patient three months after treatment.



10*9th/L). Kidney and liver function were normal. Empirical intravenous cefotaxime was started admission after urine and stool cultures were obtained.

An abdominal CT scan revealed an enlarged, fluid-filled uterus measuring 8,6 cm x 4,8 cm with no other abdominal abnormalities (Figure 1).

On the second day of admission, a hysteroscopy and vaginal examination under general anesthesia revealed a narrow cervix with drainage of a small amount of pus, confirming the diagnosis of pyometra. No congenital malformations or clinical signs of sexual abuse were found during the examination. Pus samples and cervical and vaginal swabs were taken. No uterine lavage or continuous drainage catheter was used during the hysteroscopy.

Given the differential diagnosis of sexual abuse, our approach in this case involved multiple discussions with both the patient and her parents. It is noteworthy that the parents demonstrated a high degree of understanding and cooperation throughout this process. In particular, the absence of any concerning indicators, coupled with a consistently consistent narrative from the patient and a reassuring vaginal examination, led to the decision to forego further investigative measures, until cultures were known.

Treatment included intravenous amoxicillin-clavulanic acid (100 mg/kg/day) and metronidazole (30 mg/kg/day), with metronidazole discontinued after five days. Clinical findings progressively improved,

and follow-up included systematic blood sampling and ultrasound, which revealed a reduction in infectious parameters and collection volume.

Pus culture showed presence of *Escherichia coli* and *Streptococcus anginosus*, both susceptible to amoxicillin-clavulanic acid.

Urine, stool, cervical and vaginal cultures remained sterile, possibly because antibiotic therapy was administered prior to culture collection or possibly because of nonspontaneous drainage of pus due to stenosis.

After ten days of intravenous antibiotic treatment, the C-reactive protein level decreased to 16 mg/L, and the volume of the pus collection on ultrasound decreased to 3.3 cm x 0.9 cm.

After discharge, oral amoxicillin-clavulanic acid was continued for four days. The medication was well tolerated and no side effects or complications were observed.

One week after discharge, a blood sample showed a negative CRP and an ultrasound showed no residual intrauterine fluid.

A follow up MRI was performed one month after discharge to rule out residual collections and possible post-infection sequelae such as hydrosalpinx or post-inflammatory peritoneal adhesions (Figure 2). These post-inflammatory complications are easily detected by MRI (3). Fortunately, in this case MRI showed no evidence of residual fluid, hydrosalpinx or peritoneal adhesions.

(Figure 2) (3).

There were no further clinical or anamnestic signs of child abuse at these follow-up visits, so this differential diagnosis was abandoned.

Discussion

Abdominal pain and fever in children are commonly associated with urinary tract infections, but other causes such as gastroenteritis, appendicitis, and pyometra should be considered. A comprehensive clinical examination is essential for diagnosis (5-7). In young children with unexplained fever above 38°C, a urinalysis is essential and urine culture is critical for the diagnosis of urinary tract infection. Empiric broad-spectrum antibiotics can be initiated if the urine sediment is positive, taking into account local antibiotic resistance patterns (4-7). Of note, resistance rates to amoxicillin are high in Belgium, and its use should be based on antimicrobial susceptibility (7).

Radiological investigations may be useful, with ultrasound recommended before CT to exclude gynecologic causes (8).

In the review of published cases by Barry et al., many patients had a history of previous acute gastroenteritis (AGE) (1). In this case, the patient also experienced gastroenteritis symptoms, such as fever, vomiting, and diarrhea, suggesting a possible ascending infection as the cause of pelvic inflammatory disease or urinary tract infection (UTI) (1). Hygiene practices in this age group, such as wiping from back to front, may have contributed to this condition, highlighting the importance of personal hygiene education. These hygiene practices are often suboptimal, because at this age they may no longer seek parental assistance for perianal hygiene (8, 9). After a secondary anamnesis it appeared that the patient wiped her bottom from the back to the front.

The article by Barry et al. hypothesized that ovarian steroids and an estrogenized endometrium may provide protection against ascending infections. Young women who have not yet reached puberty do not have this protection and are therefore more at risk for ascending genital infections (1). The possibility of sexually transmitted diseases and pathogens must be considered in the differential diagnosis of pyometra, in all children, given the pathogenesis of PID in adults. Therefore, child abuse should be considered in all pediatric cases of pyometra.

Conclusion

Pyometra and gynecologic infections should be considered in the differential diagnosis of abdominal pain with fever in young girls, especially in the absence of other abdominal focus of infection such as UTI, or AGE. A comprehensive clinical examination, specimen sampling, and imaging are crucial when there is a history of persistent fever, abdominal pain, and weight loss. Empirical initiation of antibiotics prior to obtaining cultures can complicate the diagnosis and mask certain pathogens and infection parameters. Treatment should include broad-spectrum parenteral antibiotics, with surgical drainage if necessary.

Conflicts of interest

There was no conflict of interest in this case report.

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