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Case Report

Minimally invasive management of pyoperitoneum attributed by spontaneous perforated pyosalpinx and pyometra

Polaki Manisha, Aparajita Jeypal, Vasundhara Yerkade, Hema Devi, Juhi Mishra, Kavita Khoiwal*, Jaya Chaturvedi

Department of Obstetrics and Gynaecology, AIIMS, Rishikesh, Uttarakhand, India

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***Correspondence:**
Dr. Kavita Khoiwal,
E-mail: kavita.kh27@gmail.com

ABSTRACT

Pyoperitoneum, apart from bowel perforation, can occur due to gynecologic causes like ruptured pyometra or ruptured tubo-ovarian abscess. Earlier, the management of pyoperitoneum included broad-spectrum antibiotics and emergency laparotomy with or without a hysterectomy and bilateral saphingo-oophorectomy. A higher rate of surgical complications like bowel or bladder injury was noted with surgery, and future fertility was also compromised in these patients. Later on, treatment strategies improved to laparoscopic drainage of pus with antibiotics without extensive surgery. However, such cases can be managed with an even more minimally invasive approach by image-guided pigtail drainage. In this report, we describe two cases of pyoperitoneum that were managed successfully with pigtail insertion and continuous drainage of pus along with antibiotics obviating the need for anaesthesia and surgery. It seems to be a promising approach for pyoperitoneum in a hemodynamically stable patient, not showing any features of severe sepsis.

Keywords: Pyoperitoneum, Pyosalpinx, Pyometra, Image-guided percutaneous aspiration, Minimally invasive management

INTRODUCTION

Pyoperitoneum is the accumulation of pus in the peritoneal cavity that occurs as a consequence of intra-abdominal infections. It can occur due to a rupture of tubo-ovarian abscess or as a result of spontaneous perforation of pyometra. The tubo-ovarian abscess has aetiologies similar to pelvic inflammatory disease (PID) and it includes immunosuppression, intrauterine device insertion and multiple sexual partners.[1] Pyometra, an accumulation of pus in the uterine cavity, has a 0.1-0.5% incidence in the general population, typically in postmenopausal females, mostly attributed to age-related atrophic cervicitis, gynecologic tumours (malignant/benign), radiation cervicitis, and intrauterine devices.[2]

The clinical appearance ranges from a pelvic mass to peritonitis with septic shock. Pyoperitoneum is generally managed surgically by laparotomy or laparoscopy. Here, we present two cases of pyoperitoneum due to spontaneously ruptured pyosalphinx and pyometra, successfully managed by image-guided percutaneous drainage.

CASE REPORT

Case 1

A 19-year-old unmarried female presented to the emergency department with abdominal pain and obstipation for 3 days. She also had abdominal distension that was insidious in onset and gradually progressive for 3 months, along with on-and-off low-grade fever.

On presentation, she was febrile and had tachycardia and tachypnoea. Abdomen was grossly distended (Figure 1 A), soft, non-tender, fluid thrill present, and bowel sounds sluggish.

Figure 1: (a) Abdominal distension on admission, (b) abdominal distension reduced significantly after pigtail insertion.

X-ray abdomen erect and supine ruled out intestinal obstruction. Investigations showed moderate anemia and leucocytosis. Empirical broad-spectrum antibiotics were started. A fever profile was found negative. CEMRI pelvis was suggestive of a large peripherally enhancing intraperitoneal collection measuring 13×24×27 cm (approximately 4.2 L) with air-fluid level extending from D12 to S1 vertebral level. It is abutting the anterior abdominal wall and uterus, communicating with bilateral adnexa. Findings suggested bilateral tubo-ovarian abscess and large intraperitoneal collection with extensions (Figure 2 A and B).

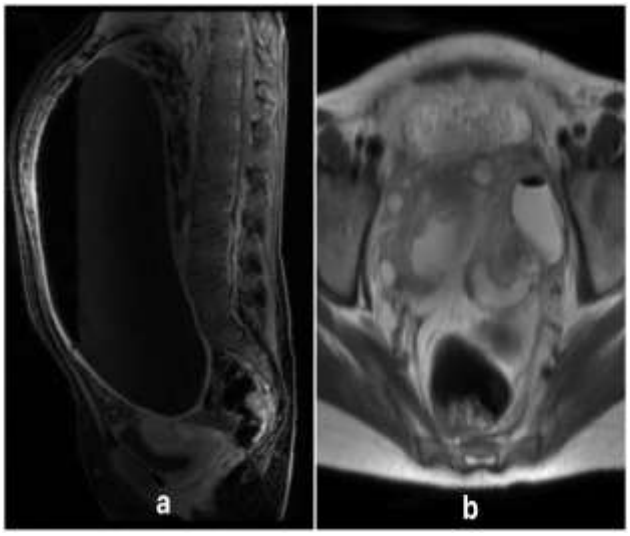

Figure 2: (a) Sagittal T1 weighted image showing large peripherally enhancing intraperitoneal collection with air-fluid levels, (b) axial T2 weighted image showing hyperintense cystic lesions in bilateral adnexa with air-fluid levels on the left side.

A minimally invasive approach in the form of image-guided percutaneous pigtail insertion and continuous drainage was planned in view of the young age. A total of 5 L of yellowish turbid purulent pus was drained from the pigtail catheter in 9 days (Figure 1 B).

Pus's GeneXpert was negative for mycobacterium tuberculosis, and cultures revealed *Klebsiella pneumonia*. Antibiotics switched according to sensitivity (T. Doxycycline 100 mg BD for 14 days). The patient responded to conservative management. The pigtail was removed after 9 days, and the patient was discharged. Follow-up ultrasound showed no evidence of collection after 2 weeks and 3 months.

Case 2

A 45-years-female P6L4A1 presented to the emergency department with a history of vomiting, non-intake of oral feeds and non-passage of faeces and flatus for 15 days. She had complaints of dull aching lower abdomen pain along with foul-smelling vaginal discharge for 3 months. There was no history of fever, burning or frequency micturition. She had no menstrual complaints; her last menstrual cycle was 25 days back. Her last childbirth was 16 years ago, and had a surgical abortion 20 years back. There was no significant surgical or medical history.

On admission, the patient was dehydrated with stable vital signs except for mild tachycardia (110/min). The abdomen was uniformly distended, soft, non-tender, and had exaggerated bowel sounds on examination. The cervix and vagina were healthy on speculum examination, with profuse yellowish foul-smelling vaginal discharge. Vaginal examination revealed a soft cervix, and bulky uterus, with bilateral fornices being free and non-tender.

Intestinal obstruction was ruled out with an erect X-ray abdomen. Blood investigations suggested neutrophilic leucocytosis. Urine and high vaginal swab cultures were sterile. CECT revealed multiple loculated peripherally enhancing collections (11×13×9) cm in the peritoneum, with the largest collection communicating with the uterine fundus and left fallopian tube through a defect of size 3.7 mm in the fundus suggested of pyoperitoneum caused by ruptured pyometra.

Broad-spectrum antibiotics were started. A plan for ultrasound-guided pigtail catheter insertion and intraperitoneal drainage was made. Approximately 2 litres of pus drained in a week's time, and then the pigtail was removed. Pus was sterile on culture testing. Follow-up scans revealed complete resolution, and the patient got symptomatically better over the days and was discharged in stable condition.

DISCUSSION

Tubo-ovarian abscess, i.e. formation of inflammatory mass involving the fallopian tube and ovary, is a late

complication of PID. Predisposing factors of PID include multiple sexual partners, a history of prior sexually transmitted infections or sexual abuse and intrauterine device insertion.[3] Symptoms usually include lower abdominal pain (98%), fever and chills (50%). Examination reveals mucopurulent cervicovaginal discharge, cervical motion tenderness, adnexal tenderness, and sometimes an adnexal mass. Laboratory tests usually show an elevated leucocyte and neutrophil count and elevated inflammatory markers. Common causative organisms are *Mycobacterium tuberculosis*, *E. coli*, *Bacteroides fragilis*, Pepto *Streptococcus*, and *Neisseria gonorrhoea*.[1] The occurrence of gross pyoperitoneum with tubo-ovarian abscess is a rare event. Our case is the first one to be reported to the best of our knowledge.

The most common cause of pyometra is a genital tract malignancy in approximately 35% of cases. Other possible causes include cervical occlusion by benign tumours, like cervical polyps, leiomyoma, forgotten intrauterine devices, infection especially senile cervicitis, and cervical occlusion after surgery or radiation.[4] The most common organisms isolated are *Streptococcus* species, *Bacteroides fragilis* and *Escherichia coli*.[2] Spontaneous perforation of pyometra is an extremely rare complication. It is associated with severe consequences, resulting in 25-40% mortality.[5] The clinical appearance of pyometra ranges from a pelvic mass to peritonitis with septic shock. Pyometra should be strongly suspected in the presence of a classic triad of purulent vaginal discharge, postmenopausal bleeding, and lower abdominal pain, however, 50% of patients are asymptomatic. Speculum examination and transvaginal ultrasonography may occasionally be the most useful tools for diagnosis.[1]

Management of pyoperitoneum gradually evolved over the decades. Initially, it was thought that it was a surgical emergency requiring emergency laparotomy with or without a hysterectomy and bilateral salphingo-oophorectomy associated with significant morbidity and mortality.[6] Medical management with injection cefoxitin 2-gram IV q8 hourly, doxycycline 100 mg BD, and metronidazole 400 mg BD PO 14 days was successful in 77% of patients, whereas medical and surgical drainage had a 93% success rate. However, surgery has postoperative complications like wound infections, ureteral injury, bowel and bladder injury.[7] Laparoscopic management was introduced to overcome surgical morbidities and was found to be safe and effective for the initial management of tubo-ovarian abscesses.[8]

Image-guided percutaneous pigtail insertion and continuous drainage is the least invasive management approach for pyoperitoneum in hemodynamically stable patients; however, the complete drainage may take a few days. Goharkhay et al found a complete response in 100% of patients treated with image-guided drainage and in 58% of patients treated with IV antibiotics alone in cases of tubo-ovarian abscesses.[9] Of the 21 women with failed medical treatment, two women underwent surgery with a hysterectomy and bilateral salpingo-oopherectomy, and 19 women underwent salvage drainage.[9]

As the current evidence suggests, Image-guided abscess drainage is usually done in unruptured abscesses; this case report adds to the literature that it can be a good option in ruptured cases too. The key to successful management of pyoperitoneum includes timely diagnosis and exercising the best modality of treatment. Hence, careful selection of the patients for image-guided drainage, considering the patient's status and disease severity, is very important for its successful outcome.

CONCLUSION

Image-guided drainage with broad-spectrum antibiotics is a promising approach in pyoperitoneum whenever a patient is hemodynamically stable, not showing any signs of severe sepsis, and fertility has to be preserved. It is a better approach than laparoscopic drainage, which is superior to laparotomy and drainage.

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