Clostridium perfringens causing spontaneous pelvic inflammatory disease, peritonitis, and toxic shock syndrome

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Introduction

- *Clostridium perfringens* (C. perfringens) is a gram-positive anaerobic pathogen.1
- Pelvic inflammatory disease mostly occurs in young, sexually active women.2
- Delayed in pelvic inflammatory treatment can cause infertility, ectopic pregnancy, and sepsis.3,4
- Pelvic inflammatory disease due to C. perfringens is rare.5
- In reproductive aged women, toxic shock due to C. perfringens is rare and is highly fatal with a mortality rate of up to 59%.6

Case Presentation

- A previously healthy, 22-year-old female presented to the emergency room with right lower quadrant abdominal pain. Only other symptom reported was a low-grade fever.
- Her past medical or surgical history was gravid 0, and she had sexual intercourse 4 years prior to admission. Her last menstrual period was two weeks ago.
- On physical exam, her abdomen was soft and diffusely tender with guarding. There was no rebound tenderness.
- Computerized tomography scan reported appendicitis with possible perforation.
- The patient was promptly taken to surgery for a laparoscopic appendectomy. However, her appendix was found to have secondary inflammatory changes. Peritonitis and diffuse torted fluid were also noted. Her fallopian tubes were dilated and fluid filled which suggested pelvic inflammatory disease. A culture of the abdominal fluid was taken.
- The patient was started on intravenous amoxicillin, metronidazole, and piperacillin/tazobactam.

Diagnosis:

- Inflammatory signs and symptoms
- Etiological considerations
- Pelvic inflammatory disease

**Morning vital signs (post op day 1):**
- Temperature: 37.8°C
- Pulse: 97 BPM
- Blood pressure: 104/62 mmHg

**Third day of admission:**
- Rectal exam revealed a small amount of fluid
- No signs of appendicitis
- She was discharged home on clindamycin for 5 days

**Discussion:**

- Pelvic inflammatory disease, peritonitis, and toxic shock from C. perfringens is rare. Toxic shock from C. perfringens is more commonly seen with pregnancy related outcomes and rarely presents in nonpregnant women.6
- This patient had a very uncommon presentation as she had no predisposing factors. She was not pregnant, had last sexual intercourse 4 years ago, no tubo-ovarian abscesses were found during surgery, and no vaginal foreign bodies were found.
- The exact cause of her pelvic inflammatory disease leading to peritonitis and toxic shock is unknown.
- Common symptoms of clostridial shock syndrome include abdominal pain, tachycardia, hypotension, third-space fluid accumulation, hemococoncentration, and a marked leukocytosis response without fever.7 In this case, the patient presented with all these symptoms.
- Before the culture results were final, the two probable causes of her infection were C. perfringens and C. sordellii. Both can cause catastrophic gynecological diseases in women of childbearing age. In addition, C. perfringens can often be misdiagnosed for C. sordellii, so it is important to keep both in the differential diagnosis.7
- Although both C. sordellii and C. perfringens can cause infections with high mortality, the presence of the vagina in the rectum is rare, so prophylactic treatment or screening is not recommended.8,9

**Conclusions:**

- Toxic shock due to C. perfringens is a rapidly progressive condition that requires prompt treatment with antibiotics and supportive measures.5
- Clinicians should be aware of the signs and symptoms of infections due to C. perfringens as they are highly fatal. In addition, patients might not present with the typical risk factors or epidemiological background, as seen in this specific case.
- It is important to include C. perfringens when considering the etiologies of pelvic inflammatory disease, peritonitis, and toxic shock syndrome.10

**References**


**Figure 1**: Gram stain and blood agar culture of *Clostridium perfringens*

**Figure 2**: Computed tomography scan of the patient’s abdomen showing a large volume of intraperitoneal fluid.

**Figure 3**: Radiograph of the patient’s chest showing a large, bilateral pleural effusion.

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