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CASE REPORT: APPENDICULAR PERITONITIS CAUSED BY *STREPTOCOCCUS PNEUMONIAE*

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ABSTRACT
Appendicular peritonitis involving *Streptococcus pneumoniae* is rare. We report here the case of a 35-year-old woman with appendicular peritonitis, during which a strain of *Streptococcus pneumoniae* was isolated. The role of intraoperative microbiological sampling in the management of appendicular peritonitis is debated. However, culture on appropriate media remains the only way to identify unusual infectious agents or bacteria of epidemiological interest, such as *Streptococcus pneumoniae*. This identification makes it possible to adjust antibiotic therapy in a targeted manner, often different from the initial probabilistic treatment.

TAGS: Appendicular Peritonitis · Acute appendicitis · Streptococcus pneumonia.

INTRODUCTION
Peritonitis caused by *Streptococcus pneumoniae* is an extremely rare condition, occurring most often in patients with predisposing factors. The interest of the case we report lies in its atypical nature, since it developed in the absence of any known predisposition to invasive pneumococcal disease.

OBSERVATION
A 35-year-old patient, with no medical history, presented to the emergency department on December 13, 2024 for pain in both iliac fossa and the hypogastric region, without vomiting or transit disorder and without associated urinary signs, with fever at 3.2 °C and tachycardia at 120 beats/min. The abdomen was sensitive as a whole with a slight defense at the hypogastric level. The pelvic touches were unremarkable. The gynaecological examination was normal as well as the examination of the urinary sediment which came back negative. Biology showed hyperleukocytosis at 23600/mm3 with 87% neutrophils. The ultrasound was inconclusive, which led to an abdominal-pelvic CT scan that showed peritoneal fat infiltration without digestive thickening with minimal intraperitoneal effusion.

The patient was kept under observation with close monitoring and symptomatic treatment for 24 hours. In view of the persistence of fever and the exacerbation of abdominal pain, an exploratory laparoscopy was chosen for acute abdominal syndrome. Intraoperative exploration objectified generalized peritonitis with a citrin fluid that was not frankly purulent, inflammatory adnexa with rare incipient false membranes, but the appendix seemed to be the cause. The rest of the exploration was normal. A bacteriological sample of the peritoneal fluid was taken at the beginning of the laparoscopy. An appendectomy and an abundant peritoneal toilet with the placement of two drains were performed. The postoperative follow-up was simple, apyrexia was obtained after 24 hours post-operatively and the patient was discharged on December 20, 2024. Direct examination of the peritoneal fluid showed a significant cellular reaction of altered polynuclear cells associated with the presence of Gram-positive cocci in candle flame.

Culture allowed the isolation of a strain of S. pneumoniae susceptible to penicillin G (MIC = 0.08 mg/ml), erythromycin, high-dose gentamycin and levofloxacillin. Appropriate antibiotic treatment was initiated: amoxicillin-clavulanic acid 1 g/8 h + gentamicin 160 mg/24h + metronidazole 500 mg/8 h.

The histopathological examination confirmed the diagnosis of gangrenous appendicitis.

DISCUSSION

Acute appendicitis is usually of polymicrobial etiology, mainly involving *Escherichia coli* and *Bacteroides fragilis*.[1] Cases of acute appendicitis associated with *Streptococcus pneumoniae* are exceptional, and its mode of colonization remains poorly understood. However, bacterial translocation or hematogenous diffusion may be the underlying mechanisms.[2]

Peritonitis caused by *Streptococcus pneumoniae* is a well-documented infection in children[3], but it remains rare in adults, especially in women. When it occurs, it is usually associated with predisposing factors for invasive pneumococcal disease, such as cirrhosis, hepatitis C, alcoholism, HIV/AIDS infection or nephrotic syndrome. However, our patient did not have any of these risk factors.

In addition, *Streptococcus pneumoniae peritonitis*, also known as primary peritonitis, is sometimes associated with genital infections in women.[4]

The association between acute appendicitis and *Streptococcus pneumoniae peritonitis* has also been described.[5] However, it seems unlikely that bacterial translocation to the intestinal lumen would occur without a pre-existing lesion. When an obvious intra-abdominal source, such as appendicitis, is identified, it is called secondary pneumococcal peritonitis.

Figure: Streptococcus pneumoniae on blood agar. When grown on blood agar, S. pneumoniae produces a zone of alpha-hemolysis and the middle of the colony often appears to be indented or punched out due to autolysis of organisms in the center of the growing colony.

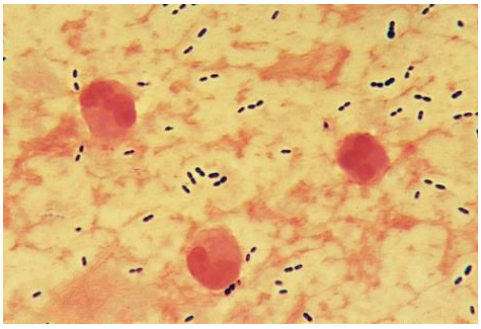
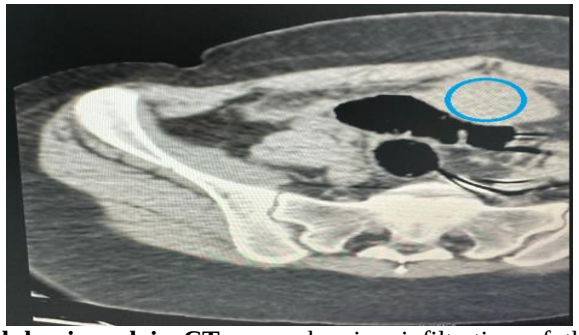


Figure 2-3 Gram stain of Streptococcus pneumoniae. This direct smear of peritoneal fluid containing *S. pneumoniae* shows the typical morphology of lancet-shaped, Gram-positive cocci in pairs. Against the pink, proteinaceous background of the specimen, the capsule of *S. pneumoniae* appears as a clear halo surrounding the organisms.



Abdominopelvic CT scan showing infiltration of the peritoneal fat without digestive wall thickening, along with a minimal intraperitoneal fluid collection.

CONCLUSION

Although the clinical signs suggestive of peritonitis may be discreet, laparoscopic exploration is a valuable option for establishing the diagnosis and initiating rapid therapeutic management. Systematic bacteriological sampling is particularly recommended when the clinical picture or the appearance of the intraperitoneal fluid has atypical characteristics. The results obtained can thus guide and optimize treatment, allowing a more targeted adaptation of antibiotic therapy.

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