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INVASIVE PNEUMOCOCCAL DISEASE PRESENTING WITH ABDOMINAL PAIN, VOMITING AND DIARRHOEA IN A PATIENT WITH MULTIPLE MYELOMA

Hélder Diogo Gonçalves[1], Ana Melício[1], Mariana Dias[1], Sara Vasconcelos-Teixeira[1], Inês Quinteiro[2], Ana Castro Barbosa[1], João Madeira Lopes[1]

[1] Serviço de Medicina Interna, Unidade Local de Saúde Santa Maria, Lisbon, Portugal
[2] Serviço de Endocrinologia, Unidade Local de Saúde Santa Maria, Lisbon, Portugal

Corresponding author's e-mail: helder.goncalves@ulssm.min-saude.pt - ana.melicio@ulssm.min-saude.pt

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ABSTRACT

Background: Streptococcus pneumoniae is a leading cause of community-acquired pneumonia and meningitis, but intra-abdominal manifestations are rare, particularly in adults without underlying peritoneal disease. Primary pneumococcal peritonitis is classically associated with cirrhosis, nephrotic syndrome, or peritoneal dialysis, and has seldom been reported in patients with haematological malignancies. Multiple myeloma significantly increases the risk of invasive pneumococcal disease due to impaired humoral immunity and hypogammaglobulinemia.

Case report: We report a 40-year-old woman with smouldering IgG lambda multiple myeloma presenting with abdominal pain, diarrhoea, vomiting, and hypotension. Laboratory tests revealed macrocytic anaemia, leukopenia with absolute neutropenia, acute kidney injury, elevated inflammatory markers, and compensated metabolic acidosis. A computed tomography (CT) scan of the abdomen and pelvis showed partially loculated ascites, peritoneal fat stranding, and thickening of duodenum, descending, and sigmoid colon walls. Blood cultures were positive for *Streptococcus pneumoniae*, confirming atypical invasive pneumococcal disease manifesting as spontaneous primary peritonitis with secondary enterocolitis. Despite broad-spectrum antibiotics, the patient developed persistent sepsis complicated by multiple intra-abdominal abscesses. Echocardiography and a spine CT scan excluded endocarditis or vertebral involvement. Source control was achieved through three ultrasound-guided percutaneous drainage procedures, resulting in gradual clinical and radiological resolution. She was discharged on day 42 with complete recovery and scheduled pneumococcal vaccination.

Conclusion: This case highlights a rare and severe gastrointestinal manifestation of invasive pneumococcal disease in a high-risk host. Spontaneous pneumococcal peritonitis complicated by multiple intra-abdominal abscesses is exceptionally uncommon in multiple myeloma. Early recognition, multidisciplinary management, and minimally invasive source control were crucial to a favourable outcome. Preventive strategies, particularly pneumococcal vaccination, remain essential to reduce morbidity in immunocompromised patients.

KEYWORDS

Invasive pneumococcal disease, *Streptococcus pneumoniae*, pneumococcal peritonitis, pneumococcal bacteraemia, intra-abdominal infection

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LEARNING POINTS

- Atypical invasive pneumococcal disease involving the peritoneum and gastrointestinal tract is rare in adults, but immunocompromised patients, such as those with multiple myeloma, are at increased risk of morbidity and mortality.
- Timely, targeted antibiotic therapy combined with effective source control through image-guided drainage of intra-abdominal abscesses is crucial for recovery and minimizes the need for surgery.
- Prompt recognition, integrated multidisciplinary management, and vaccination are essential to improve outcomes and prevent recurrence in vulnerable patients

INTRODUCTION

Invasive pneumococcal disease (IPD) is defined by the isolation of *Streptococcus pneumoniae* from a normally sterile site. This bacterium is one of the most important and prevalent human pathogens, being the leading cause of community-acquired pneumonia and a frequent cause of meningitis. Intra-abdominal and pelvic pneumococcal infections, however, are atypical and rare in adults[1-4].

Primary pneumococcal peritonitis (PPP), defined as inflammation of the peritoneal cavity without an identifiable intra-abdominal source, is uncommon in otherwise healthy individuals and is classically associated with liver cirrhosis, nephrotic syndrome, or peritoneal dialysis[2,3,5-7]. The incidence of IPD is markedly higher in immunocompromised patients, particularly those with haematological malignancies. Multiple myeloma confers a significantly increased risk due to hypogammaglobulinemia and impaired antibody-mediated responses against encapsulated bacteria[3,6,8].

Although abdominal symptoms such as pain, vomiting, and diarrhoea are common responses to many systemic illnesses, they are rarely highlighted in the context of IPD. Gastrointestinal manifestations secondary to primarily non-gastrointestinal infections, including pneumococcal bacteraemia, have been described but remain underreported in the literature[9-11].

This case report describes an atypical and unusual gastrointestinal manifestation of IPD, presenting as severe primary pneumococcal peritonitis complicated by multiple intra-abdominal abscesses in a patient with multiple myeloma, an exceptionally rare presentation in a high-risk host[4,6].

CASE DESCRIPTION

A 40-year-old woman, a primary school teacher, with smouldering IgG lambda multiple myeloma, was admitted to the emergency department with abdominal pain, vomiting and diarrhoea for 2 days.

On examination, she was hypotensive (blood pressure 83/53 mmHg), normocardic, afebrile, pale, and dehydrated, with diffuse abdominal tenderness and mild guarding on palpation.

Laboratory tests revealed macrocytic anaemia (Hb 10.8 g/dl), leukopenia (600/µl), absolute neutropenia, normal platelets, hyperfibrinogenaemia, acute renal injury (urea 157 mg/dl, creatinine 5.26 mg/dl), raised acute-phase reactants (C-reactive protein 63 mg/dl, procalcitonin 208.8 ng/ml), with no liver enzymes or amylase abnormalities. Arterial blood gas analysis showed compensated metabolic acidosis. A computed tomography (CT) scan of the abdomen and pelvis showed partially loculated ascites, intense peritoneal fat stranding, and wall thickening of the duodenum, descending, and sigmoid colon, suggestive of secondary enterocolitis.

Intravenous fluids, filgrastim and empirical antibiotic therapy with piperacillin-tazobactam were initiated after blood cultures were obtained, and she was transferred to the Internal Medicine ward for further management.

Blood cultures were positive for *S. pneumoniae*, suggesting atypical IPD presenting as spontaneous primary peritonitis and secondary enterocolitis in the context of multiple myeloma-related immunosuppression. The case was reported to the Portuguese national notification platform (SINAVE).

The initial clinical course was unfavourable, with fever, worsening abdominal pain and distension, lower back pain, elevated inflammatory markers, and progressive thrombocytopenia, though renal function gradually improved. Stool cultures and *Clostridioides difficile* testing were negative. Suspecting piperacillin-tazobactam induced immune thrombocytopenia, therapy was switched to meropenem on day 3. Diagnostic and therapeutic initial paracentesis of loculated ascites yielded purulent fluid, microbiologically negative. Antibiotics were adjusted to ciprofloxacin and tigecycline on day 8 following Antimicrobial Stewardship consultation. Transthoracic echocardiography showed no valvular vegetations, and thoracic/lumbar spine CT scan revealed no osteomyelitis, spondylodiscitis, or osteolytic lesions.

By day 20, inflammatory markers remained elevated, and follow-up CT scan of the abdomen and pelvis demonstrated persistent peritonitis, complicated by multiple intra-abdominal collections, including subdiaphragmatic, bilateral flank, and pelvic abscesses extending from the pouch of Douglas to the vesicouterine and anterior pelvic spaces. Antibiotic therapy was maintained, and source control was achieved through three successive ultrasound-guided percutaneous drainage sessions, resulting in symptom improvement, marked reduction of the collections, and normalization of inflammatory parameters, without microbiological isolates. Follow-up pelvic CT scan on day 38

showed near-complete resolution of the remaining anterior and posterior pelvic collections and marked improvement of pelvic fat stranding.

The patient was discharged on day 42 in complete clinical recovery, with sustained apyrexia and hemodynamic stability, continuing oral antibiotic therapy with ciprofloxacin and doxycycline for an additional 2 weeks. Subsequent follow-up was arranged in Internal Medicine and Haematology, and pneumococcal vaccination was scheduled.

DISCUSSION

Spontaneous pneumococcal peritonitis is a rare form of IPD, particularly in adults without underlying peritoneal pathology. Reports are scarce, and most published cases involve patients with cirrhosis, nephrotic syndrome, or peritoneal dialysis. Occurrence in a patient with multiple myeloma highlights the vulnerability of immunocompromised hosts, where impaired humoral immunity and antibody deficiency markedly increase susceptibility to encapsulated bacteria[2,5,8].

Gastrointestinal symptoms such as diarrhoea, abdominal pain, and vomiting have been recognized as possible but infrequent manifestations of invasive pneumococcal disease[9-11]. These symptoms reflect the limited repertoire of systemic inflammatory responses to infection and may lead to initial diagnostic confusion with primary gastrointestinal disease.

Our patient's presentation with abdominal sepsis illustrates the severity of IPD in this setting. Absolute neutropenia likely contributed to the unfavourable initial course. The pathogenesis in such cases remains uncertain. Haematogenous spread from nasopharyngeal colonization is considered the most plausible mechanism, although gastrointestinal translocation facilitated by diarrhoea and immunosuppression cannot be excluded[2-4,6,7].

Diagnosing atypical IPD remains challenging, as clinical features may mimic other intra-abdominal infections. These cases are often linked to non-vaccine serotypes and resistant strains, which complicates empirical therapy. In this patient, despite appropriate broad-spectrum coverage with piperacillin–tazobactam, clinical deterioration and abscess formation reflected the limitations of antibiotic therapy alone[1,5,7].

Source control proved decisive. Serial image-guided percutaneous drainage provided substantial improvement, avoided open surgery, and combined effectively with prolonged antibiotic therapy. This minimally invasive approach is supported by high success rates in complicated intra-abdominal infections and was crucial for resolution[5,7].

While atypical presentations of pneumonia are classically associated with *Mycoplasma pneumoniae*, *Legionella pneumophila*, and other non-pneumococcal pathogens, this case underscores that *S. pneumoniae* can also present atypically with predominant gastrointestinal involvement, especially in immunocompromised hosts.

Beyond acute management, prevention remains important. Patients with multiple myeloma have a significantly increased risk of recurrent IPD, making pneumococcal vaccination an essential secondary preventive strategy[6,8].

In conclusion, this case illustrates a rare and severe gastrointestinal manifestation of IPD in a high-risk host, emphasizing the importance of early recognition, multidisciplinary management, and timely source control in achieving a favourable outcome[5,12].

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