

# From the Pharynx to the Abdomen: A Case of Primary Peritonitis

## Da Faringe para o Abdómen: Um Caso de Peritonite Primária



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### ABSTRACT

Primary peritonitis usually occurs in patients with comorbidities previously diagnosed with ascites. However, a primary peritoneal infection in previously healthy patients may also ensue. There has been an increase in reported cases of primary peritonitis due to *Streptococcus pyogenes* affecting mostly women. It usually presents as a severe acute abdominal pain, which prompts surgical exploration. Although infected ascitic fluid is seen, there is no rupture. In this article, we present a case of primary peritonitis due to *Streptococcus pyogenes* which rapidly evolved to septic shock and acute respiratory distress syndrome. The abdominal and pelvic computed tomography at admission showed no ascitic fluid. However, a few hours later, during surgical exploration, purulent ascitic fluid was seen throughout the abdominal cavity. It is important to be aware of this rapid accumulation of ascitic fluid, even without visceral perforation, as peritoneal lavage may be warranted to contain the infection.

**Keywords:** Peritoneal Lavage; Peritonitis; Shock, Septic; *Streptococcus pyogenes*; Tonsillitis

### RESUMO

A peritonite primária geralmente ocorre em doentes com co-morbilidades previamente diagnosticados com ascite. Pode também ocorrer num doente previamente saudável. Recentemente, tem havido um número crescente de relatos de peritonite primária por *Streptococcus pyogenes*, com maior incidência nas mulheres. Nestes casos, geralmente ocorre dor abdominal aguda e intensa, que motiva intervenção cirúrgica urgente, constatando-se posteriormente não haver ruptura de víscera oca, embora haja líquido ascítico purulento. Neste artigo, descrevemos um caso de peritonite primária por *Streptococcus pyogenes*, que evoluiu rapidamente para choque séptico e síndrome de dificuldade respiratória aguda. Embora a tomografia computadorizada inicial não tenha revelado líquido ascítico, algumas horas após, durante o ato cirúrgico, observou-se líquido ascítico purulento em grande quantidade. Esta rápida acumulação de líquido purulento na cavidade abdominal, mesmo sem perfuração de víscera oca, deverá ser rapidamente reconhecida, sendo que a lavagem peritoneal poderá vir a ser uma opção para conter o foco de infeção.

**Palavras-chave:** Choque Séptico; Lavagem Peritoneal; Peritonite; *Streptococcus pyogenes*; Tonsilite

### INTRODUCTION

Primary peritonitis is defined as a monomicrobial peritonitis occurring without an intra-abdominal source of infection and showing an elevated polymorphonuclear leukocyte count of at least 250 cells/mm<sup>3</sup> and a positive ascitic fluid culture.<sup>1</sup> It usually occurs in patients with comorbidities such as liver cirrhosis, nephrotic syndrome or immunosuppression.<sup>2</sup>

Primary peritonitis due to *Streptococcus pyogenes* (*S. pyogenes*) is a very rare entity and is believed to occur in patients with infection by this bacterium in a remote site. Abdominal complaints usually lead to surgical exploration and the diagnosis is not considered until blood or ascitic fluid cultures grow this bacterium.<sup>3</sup>

We report a case in which a female patient presented with abdominal pain initially regarded as being caused by perforation of an intra-abdominal organ, that eventually progressed to septic shock and acute respiratory distress syndrome (ARDS) due to peritonitis from *S. pyogenes*.

### CASE REPORT

A 59-year-old woman presented to the emergency department complaining of fever, colic abdominal pain,

vomiting and diarrhea that had begun on the same day. On further questioning, she also reported having a sore throat for two days, with right tonsillar exudate. Her medical history was remarkable for hypothyroidism and colitis due to *Enterococcus* two years before.

Blood tests showed a mildly elevated leukocyte count (12.1 x 10<sup>9</sup>/L), an elevated C-reactive protein (CRP) of 185 mg/L and creatinine of 1.23 mg/dL (108.7 μmol/L), with lipase and amylase within normal range. Computed tomography (CT) of the abdomen and pelvis showed signs of densification of the root of the mesentery and fluid-filled small bowel and ascending colon (Fig. 1A). She was then transferred to our hospital.

Upon arrival to our emergency department, the patient was conscious, alert and well oriented, yet hypotensive (78/42 mmHg), tachycardic, hypoxemic, with diffuse abdominal pain upon palpation. An arterial blood gas revealed a metabolic acidosis (pH 7.24, HCO<sub>3</sub> 19 mmol/L) with elevated lactate (4.8 mmol/L, 43 mg/dL) and a new set of blood tests a few hours later revealed an increasing CRP of 364 mg/L, INR of 1.6, creatinine of 1.4 mg/dL (123.7 μmol/L).

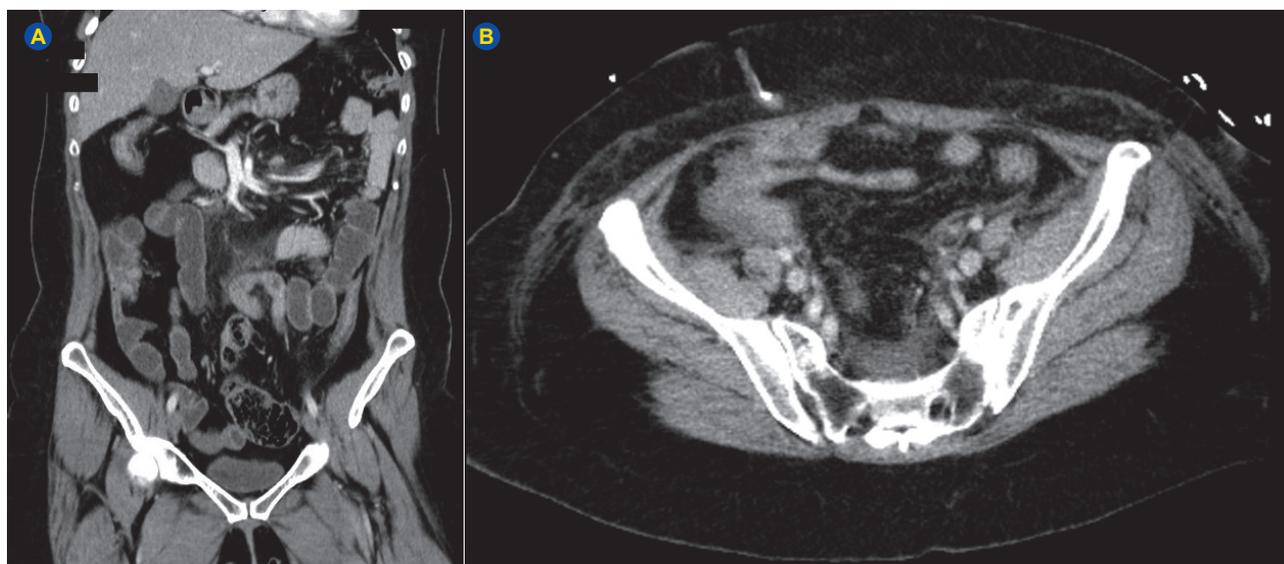
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**Figure 1** – Abdominal and pelvic computed tomography scan: at admission showing fluid-filled intestinal loops, without evidence of ascites (A); 24 hours after the surgical procedure, evidencing a residual amount of ascitic fluid in the pelvic cavity and multiple reactive lymphatic ganglia (B).

She remained hypotensive despite fluid therapy, with lactate levels still elevated (4.4 mmol/L, 39.6 mg/dL). Septic shock with multiple organ dysfunction was diagnosed from a probable abdominal source, the patient was started on antibiotics (ceftriaxone and metronidazole) and an exploratory laparoscopy was performed. During the procedure, purulent ascitic fluid was seen spanning the entire abdominal cavity, with no evidence of perforated hollow viscus. However, no ascitic fluid cultures were performed. She was then admitted to the Intensive Care Unit (ICU). Ampicillin was added afterwards for double synergistic cover of suspected *Enterococcus* infection.

During her stay on the ICU, the patient initially needed increasingly higher doses of noradrenaline, up to 0.9 mcg/kg/min, and invasive mechanical ventilation with a fraction of inspired oxygen of 70% and a positive end-expiratory pressure up to 12 mmH<sub>2</sub>O. Given this picture and with the intent of further clarifying intra-abdominal sources of infection, namely a perforation that could have been missed during the surgery, a repeat CT scan was done on the second day of admission. It was remarkable only for parietal thickening of the entire large bowel, with some remaining ascitic fluid (Fig. 1B). She went on to develop ARDS on the fourth day of admission.

Blood cultures taken at admission eventually grew *Streptococcus pyogenes* at day six of admission, sensitive to penicillin and clindamycin, which prompted the de-escalation of antibiotics to ceftriaxone and addition of clindamycin to the antibiotic therapy, although streptococcal toxic shock syndrome criteria were barely not fulfilled. Nevertheless, there was already a decrease in the need for organ support and reduction of inflammation parameters. Vasopressors were withdrawn at the eighth day and extubation took place at the eleventh day of admission. She was transferred to the internal medicine ward, where she had an uneventful recovery.

Based on the overall clinical picture, primary peritonitis from *Streptococcus pyogenes* infection was diagnosed in retrospect. Peritonitis was most likely due to hematogenous spread of this bacteria that had initially caused tonsillitis.

## DISCUSSION

*Streptococcus pyogenes* belongs to group A streptococci, that usually cause upper respiratory tract and cutaneous infections. Peritonitis due to this bacterium is rare, as only 35 cases have been reported, according to a review from Malota and colleagues published in 2015.<sup>3</sup> It affects women four times more than men and occurs mostly in a younger age (median age of 38 years).<sup>3</sup> The reason for this greater incidence in women has been attributed to its ascent from the genital tract, although hematogenous seeding from the pharynx and soft tissue infections have also been described.<sup>3</sup> There are several risk factors for invasive *S. pyogenes* (Table 1), yet this patient presented none apart from the pharyngeal infection.<sup>4</sup>

Primary peritonitis due to *S. pyogenes* generally presents as severe abdominal pain and fever. Diarrhea may also occur.<sup>3</sup> Other symptoms related to the initial focus of infection can also be present. A diagnosis is made when there are positive cultures for this bacterium, whether in the blood or ascitic fluid, without other source of abdominal infection. In many reported cases, the diagnosis was made based only on positive blood cultures.<sup>3</sup> Streptococcal toxic shock syndrome (STSS), whose diagnostic criteria are shown in Table 2, may ensue.<sup>5</sup>

The abdominal complaints usually prompt an urgent abdominal CT scan, which may show fluid collections and intestinal edema, but without evidence of perforation or source of infection. However, the CT scan cannot fully rule out secondary peritonitis, hence in many reported cases exploratory laparoscopy or laparotomy is eventually performed.<sup>3</sup> This is a matter of debate, as some authors

**Table 1** – Risk factors for invasive *S. pyogenes* infection; adapted from reference<sup>4</sup> NSAID - non-steroidal anti-inflammatory drugs

Previous or current non-infectious conditions	Alcoholism Malignancy Chronic respiratory conditions Chronic and traumatic skin lesions Smoking Steroid use	Injection drug use Liver disease NSAID use Obesity Pregnancy Diabetes Heart disease
Previous or current infectious conditions	Epstein-Barr virus Pneumonia Acute tonsillitis	HIV Influenza
Socio-economic factors	Co-habitation with a child	

**Table 2** – Center for Disease Control 2010 Case Definition for Streptococcal toxic shock syndrome

1. Isolation of group A beta-hemolytic streptococci	2. Clinical signs of severity
a. from a normally sterile site (blood, cerebrospinal fluid, peritoneal fluid, tissue biopsy); b. from a non-sterile site (throat, vagina, sputum).	a. systolic blood pressure $\leq$ 90 mmHg b. two or more of the following: i. renal impairment (creatinine $>$ 2 mg/dL); ii. coagulopathy (platelets $\leq$ 100 x 10 <sup>9</sup> /L or DIC); iii. Hepatic involvement (ALT, AST or total bilirubin twice the upper limit of normal); iv. ARDS; v. generalized erythematous macular rash that may desquamate; vi. soft-tissue necrosis, including necrotizing fasciitis, myositis or gangrene.
<b>Probable case:</b> 1b + 2a + 2b, if no other cause for the illness is found	
<b>Definite case:</b> 1a + 2a + 2b	

ARDS: acute respiratory distress syndrome; DIC: disseminated intravascular coagulation; ALT: alanine aminotransferase; AST: aspartate aminotransferase

advocate no need for surgery, instead opting for paracentesis to obtain cultures of ascitic fluid, while others recommend exploratory laparoscopy to obtain cultures and perform a peritoneal lavage.<sup>6,7</sup> There is no unequivocal evidence that surgical peritoneal lavage improves the prognosis in primary peritonitis due to *S. pyogenes*, although Wood and colleagues suggested that in streptococcal toxic shock syndrome drainage of infected fluid (not necessarily ascitic fluid) reduces bacterial and exotoxin load and is thus essential to improve survival.<sup>8</sup> Moreover, at least in secondary peritonitis, early source control is essential to decrease mortality.<sup>9</sup> Of note in this case is the lack of ascitic fluid on the initial CT, yet a considerable amount was seen during the exploratory laparoscopy, which took place roughly 24 hours after the initial CT was performed. Malota and colleagues also describe a case where there was rapid buildup of purulent ascitic fluid, within eight hours.<sup>3</sup> This may require regular monitoring of ascitic fluid accumulation in these cases, if the intent is to reduce intra-abdominal bacterial and exotoxin load.

Antibiotic treatment is initially broad-spectrum, especially since secondary peritonitis may usually be the first suspicion. *S. pyogenes* is sensitive to beta-lactam antibiotics.<sup>5</sup> In cases of STSS, the addition of clindamycin or linezolid is warranted, given their ability to inhibit exotoxin production.<sup>7,10</sup> Macrolide-resistant *S. pyogenes* strains may also be resistant to clindamycin.<sup>5</sup>

Although in this case no culture of ascitic fluid was performed, we can assume that peritonitis in this patient was caused by *S. pyogenes*, due to the patient's recent

history of tonsillitis and since no evidence of bowel perforation was noted and blood cultures were positive for this bacterium. Early peritoneal lavage in these cases remains of uncertain benefit, yet the potential complications of this disease (septic shock, ARDS, STSS) may warrant at least a minimally invasive exploration and lavage.

#### CONTRIBUTORSHIP STATEMENT

All authors contributed equally to this work

#### PROTECTION OF HUMANS AND ANIMALS

The authors declare that the procedures were followed according to the regulations established by the Clinical Research and Ethics Committee and to the Helsinki Declaration of the World Medical Association.

#### DATA CONFIDENTIALITY

The authors declare having followed the protocols in use at their working center regarding patients' data publication.

#### PATIENT CONSENT

Obtained.

#### CONFLICTS OF INTEREST

All authors report no conflict of interest.

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# A Rare Case of Spontaneous Remission and Relapse of a Primary Central Nervous System Lymphoma

## Caso Raro de Remissão Espontânea e Posterior Recidiva de Um Linfoma Primário do Sistema Nervoso Central



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### ABSTRACT

Primary central nervous system lymphoma remission after steroid treatment is a well-known phenomenon, but remission without any type of treatment is extremely rare. We present a rare case of spontaneous remission of a diffuse large B-cell lymphoma of the central nervous system as well as its subsequent reappearance in another location. The atypical presentation misled the neurosurgeons and neurologists, delaying diagnosis and treatment. The patient underwent brain biopsy after the relapse and started radiotherapy and chemotherapy with cytarabine + methotrexate + rituximab. As of 32 months after the diagnosis, the patient remained asymptomatic, with no focal neurological deficits and the disease in complete remission. A PubMed search of the literature up to June 2017 regarding spontaneous remission central nervous system lymphoma was also carried out.

**Keywords:** Central Nervous System Neoplasms/drug therapy; Central Nervous System Neoplasms/radiotherapy; Lymphoma/drug therapy; Lymphoma/radiotherapy

### RESUMO

É bem conhecida a remissão com corticoterapia dos linfomas primários do sistema nervoso central, mas a sua remissão sem qualquer tipo de tratamento é extremamente rara. Apresentamos um caso raro de uma remissão espontânea e posterior recidiva noutra localização de um linfoma difuso de grandes células B do sistema nervoso central. A apresentação atípica deste caso confundiu os neurocirurgiões e neurologistas, atrasando o diagnóstico e tratamento. A doente foi submetida a biópsia de uma das lesões cerebrais e, posteriormente, iniciou radioterapia e quimioterapia com citarabina + metotrexato + rituximab. Neste momento, 32 meses após o diagnóstico histológico, a doente encontra-se assintomática, sem défices neurológicos focais e com remissão completa da doença. Foi também efetuada uma pesquisa na PubMed até junho de 2017 sobre a remissão espontânea dos linfomas do sistema nervoso central.

**Palavras-chave:** Linfoma/quimioterapia; Linfoma/radioterapia; Neoplasias do Sistema Nervoso Central/quimioterapia; Neoplasias do Sistema Nervoso Central/radioterapia

### INTRODUCTION

Malignant lymphomas can affect the central nervous system (CNS) in three ways: as primary CNS lymphoma, as a consequence of systemic lymphoma, and by intravascular lymphomatosis.<sup>1</sup>

Primary CNS lymphoma is a rare form of extranodal non-Hodgkin's lymphoma.<sup>2,3</sup> Its incidence has increased in both immunocompetent and immunodeficient patients, and currently accounts for about 2.2% of all intracranial tumors<sup>4,5</sup> and 1% - 2% of all lymphomas.<sup>6</sup> Most cases are sporadic, with a minority associated with cases of immuno-

deficiencies including human immunodeficiency virus (HIV) and iatrogenic immunosuppression.<sup>4</sup>

Primary CNS lymphoma can affect individuals of all ages, with a peak incidence in immunocompetent patients occurring between the fifth and seventh decades of life<sup>5</sup> and with a mean age of 60 years.<sup>2</sup>

The clinical manifestations vary depending on the location of the lesion. The most common symptoms are psychiatric changes, headaches, seizures, ocular symptoms and other neurological focal deficits.<sup>7</sup>

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