



Case illustrated

Splenic infarction secondary to COVID-19 complicated by *Clostridium Paraputrificum* infection

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ARTICLE INFO

Article history:

Received 11 October 2021

Received in revised form 1 December 2021

Accepted 5 December 2021

Keywords:

Clostridium paraputrificum

COVID-19

Splenic abscess

Splenic infarction

ABSTRACT

A 58-year-old woman with COVID-19 presented with an acute abdomen. Her spleen was found to be infarcted with a large fluid and gas collection. Treatment included broad-spectrum antibiotics and CT-guided drainage. Definitive treatment was splenectomy. We postulate that COVID-19 related splenic infarction created ideal conditions for *Clostridium paraputrificum* to cause a splenic abscess.

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A 58-year-old woman presented to the emergency department (ED) with generalized weakness and left sided abdominal pain. Her past medical history included diabetes mellitus type 2, hypertension, and reflux. She was found to be COVID-19 positive by PCR screen. Complete blood count, serum electrolytes and urinalysis were benign. She was discharged.

She returned to the ED six days later with right upper quadrant (RUQ), epigastric, and left upper quadrant (LUQ) abdominal pain, with mild chills, nausea, and vomiting. She complained of a mild cough, shortness of breath and left shoulder pain. She was afebrile, tachycardic, hypertensive (167/75 mmHg) and 98% on 3 L nasal prongs. On exam, she was tender to the RUQ and LUQ, but had no signs of peritonitis. She had an elevated white count of 17, a C-reactive protein of 423, and blood glucose was 19.6 mmol/L.

An abdominal CT showed thromboses within the splenic artery, splenic vein, and the portal system. Additionally, the spleen was enlarged with a fluid and gas collection that measured 11 × 8.5 × 14 cm (Fig. 1). There was some free air within the upper abdomen.

Gram stain from blood cultures showed gram-negative bacilli. However, blood cultures grew *Clostridium paraputrificum*, a gram-positive bacillus. The patient underwent CT-guided drainage of the splenic abscess. She was maintained on piperacillin-tazobactam and clindamycin therapy. When sensitivities showed the isolate was resistant to clindamycin with intermediate sensitivity to penicillin, she

was switched to meropenem. She completed a 10 day course of dexamethasone for COVID-19 infection.

A repeat abdominal CT showed that the splenic abscess drain became mispositioned, and the abscess unchanged. As percutaneous drainage was unsuccessful, she had a splenectomy. *Clostridium* spp. are spore-forming anaerobes and account for 10% of all anaerobic infections [1]. *Clostridium* spp. are gram-variable and can decolorize easily, which explains why our isolate was gram-negative despite it being a gram-positive organism. *Clostridium paraputrificum* is an extremely rare isolate, accounting for 1.5% of clostridial bacteremia [2].



Fig. 1. Abdominal CT scan showing fluid and gas within the spleen.

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COVID-19 infection is associated with both venous and arterial thromboses. In one paper 20 of 200 people with COVID-19 had arterial thromboses, and 3 of 20 had splenic infarcts [3]. Splenic abscess is a very uncommon presentation, and 10% of splenic abscesses occur at the site of a splenic infarction [4]. Splenectomy will often be required [4].

We postulate that COVID-19 related splenic infarction created ideal conditions for *Clostridium parapatrificum* to cause a splenic abscess.

Funding

None to report.

Informed consent

informed consent was obtained from the patient. A written and signed consent form is available upon request.

CRediT authorship contribution statement

Both authors contributed towards writing and editing the manuscript.

Declaration of Competing Interest

The authors report no conflicts of interest.

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