

IMAGE CHALLENGE

Recurrent abdominal pain in a 7-year-old girl

CLINICAL INTRODUCTION

A 7-year-old girl was admitted to the emergency department for a 2-month history of recurrent abdominal pain, accompanied by nocturnal awakening, vomiting and interruption of daily activities. Her medical history was unremarkable, her family had recently moved from a low-income country.

At admission, the girl was afebrile, with mild abdominal tenderness without guarding. Blood tests showed neutrophilic leucocytosis (white blood cells 21 740/mL, N 18 620/mL), with haemoglobin 14 g/dL and thrombocytosis (platelets 685 000/mL) with C-reactive protein (CRP) level (0.5 mg/dL, normal range 0–0.5 mg/dL). An abdominal ultrasound scan failed to show abnormalities. Twelve hours after admission, the abdominal pain worsened, the temperature spiked to 39°C, the abdominal examination showed increased tenderness and diffuse guarding, while the CRP rose to 5.9 mg/dL. A supine X-ray was performed (figure 1).

WHAT IS THE DIAGNOSIS?

- A. Appendicitis
- B. Bowel perforation
- C. Choledocholithiasis with cholangitis
- D. Kidney stones with urinary tract infection



Figure 1 Abdominal X-ray.

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ANSWER: B

Radiography revealed a large pneumoperitoneum outlining the falciform ligament in the upper quadrant (figure 2, white arrow). This radiologic appearance, known as 'falciform ligament sign' is suggestive for a bowel perforation.¹ The falciform ligament connects the liver to the anterior abdominal wall, extending inferiorly beyond the liver, where it becomes the round ligament. Although the presence of air above the diaphragm is the more suggestive sign of pneumoperitoneum (the 'dome sign'), sometimes it may be less evident (black arrow), in case of localised perforation, of supine film and of minimal presence of gas in the abdomen. CT has a higher sensitivity, and in this case confirmed the



Figure 2 Abdominal X-ray showing free intraperitoneal gas (black arrowhead).

radiologic findings (online supplemental material A,B). The patient underwent an abdominal exploration and a covered perforation was found at the pyloroduodenal junction. When specifically questioned, the family reported that the patient's father was on medication for *Helicobacter pylori*. Positivity of *H. pylori* stool antigen test and bacterial culture confirmed the diagnosis of *H. pylori*-related ulcer and treatment was started. *H. pylori* infection is more prevalent in developing countries than developed ones,² and it may cause a chronic ulcer leading to perforation.¹ While *Helicobacter* infection's symptoms are somehow specific in adults, most infected children are asymptomatic or have non-specific symptoms.^{2,3}

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