

Case Report

A Rare Case of Spontaneous Intestinal Perforation at a Paediatric Emergency Department

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Abstract Abdominal pain is a major complaint at the paediatric emergency department. Intestinal perforation is rare, and it is usually caused by other intestinal diseases or appears in patients with risk factors. We present a case of spontaneous intestinal perforation in a completely healthy patient. The present case is a reminder that spontaneous intestinal perforation can occur in healthy people without any underlying diseases or other risk factors.

Key words Abdominal pain; Intestinal perforation; Peritonitis; Pneumoperitoneum

Introduction

Abdominal pain is a major complaint at the paediatric emergency department. Diseases that require immediate surgical intervention or are life-threatening are extremely critical, and one of such situations is intestinal perforation. Intestinal perforation is rare, occasionally difficult to diagnose, and can lead to septic shock or even death without proper treatment. Usually, it occurs when patient has previous medical conditions, such as acute enterocolitis. In this article, we present a paediatric patient suffered from spontaneous intestinal perforation without any underlying disease or previous medical condition.

Case

A 3-year-old girl suffered from a sudden onset of abdominal pain without vomiting or diarrhoea after waking

up in the morning. She was brought to the emergency department at Hsinchu Mackay Memorial Hospital in Taiwan. She was healthy without any discomfort before the previous night. Underlying disease or surgical history was denied. At the emergency department, her body temperature was 39.2°C. Physical examination revealed a flat abdomen with hypoactive bowel sound. However, abdominal tenderness, mass, or peritoneal signs could not be evaluated using palpation because she was uncooperative and crying persistently during examination. When walking, she bent her body forward slightly. Erect abdominal radiography revealed abundant stool in the colon with local air collection in the right and left upper abdomen. We arranged for a lateral decubitus abdominal radiography, but no radiological evidence of pneumoperitoneum was found. Abdominal ultrasound found diffuse gaseousness without evidence of appendicitis, intussusception, or intestinal obstruction. Hard stool passed after an enema. She then felt more comfortable despite the persistence of abdominal pain. We suggested staying at the emergency department for further observation, but her parents requested discharge and went home. At home, the abdominal pain progressed and high fever persisted. No vomiting or respiratory tract infection symptoms were noted. She passed loose stool twice. In addition, she refused to walk and asked her parents to carry her all day. The next morning, she was brought back to our emergency department. Abdominal tenderness, mass, or peritoneal signs again could not be evaluated because she was uncooperative during examination.

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Blood sampling revealed the white blood cell count to be 21,700/ μ L and serum C-reactive protein to be 28.69 mg/dL. Repeated standing and lateral decubitus abdominal plain film didn't reveal any radiologic signs of pneumoperitoneum, such as continuous diaphragm sign, Rigler's sign, falciform ligament sign, football sign, or Telltale triangle sign (Figure 1). Abdominal ultrasound revealed bowel dilatation without obvious peristalsis. Abdominal CT showed free air under the diaphragm (Figure 2). The patient received surgical intervention, and a perforation hole was seen in the descending colon. No foreign body was found. After surgical repair of the perforation and antibiotics treatment, she recovered and was discharged with a favourable general condition. Pathologic results illustrated necrotic tissue with infiltration of acute inflammatory cells. No other specific sign of neoplasm was found.



Figure 1 Lateral decubitus abdominal plain film didn't find any evidence of free intra-abdominal air.

Discussion

Intestinal perforation has various aetiologies including appendicitis, foreign body ingestion, diverticulitis, bowel ischaemia, Crohn disease, neoplasm, anorectal malformation and iatrogenic causes.¹⁻⁴ Trauma or child abuse can also cause intestinal perforation.^{5,6} In neonates, necrotising enterocolitis may complicate intestinal perforation. Moreover, idiopathic spontaneous intestinal perforation is a clinical entity distinct from necrotising enterocolitis.⁷ Necrotising enterocolitis and idiopathic spontaneous intestinal perforation occur mainly in premature infants, particularly those with very low birth weight. Chen et al⁸ discussed spontaneous intestinal perforation in children, but all of those patients had symptoms of acute enterocolitis such as fever and diarrhoea. Therefore, intestinal perforation is usually caused by other intestinal diseases or appears in patients with risk factors. In the present case, the patient was completely healthy before the onset of abdominal pain and fever. She had no underlying diseases or other gastrointestinal symptoms or signs before colonic perforation. Under this condition, considering intestinal perforation in the differential diagnosis is difficult. The only clues that indicated the possibility of intestinal perforation were the patient's inability to walk normally and the need to bend her body forward when moving. When these signs appear, a patient usually has acute abdomen that requires immediate treatment or even surgical management. That was the reason we arranged for more image studies, including abdominal CT, to locate any conditions requiring surgery and diagnose this patient quickly.

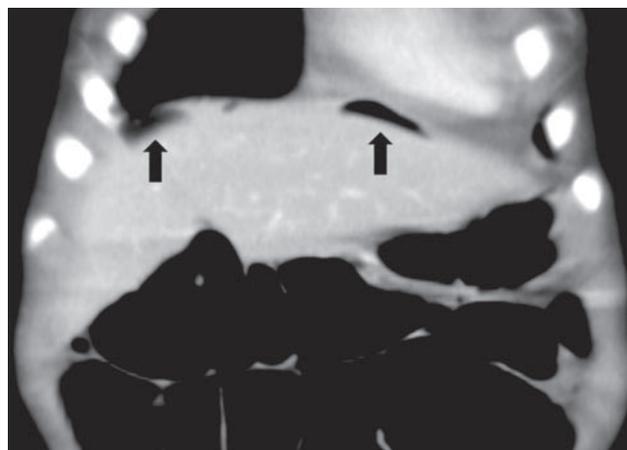


Figure 2 Abdominal CT illustrated free intraperitoneal air (black arrow) under the diaphragm.

When intestinal perforation is suspected, several examinations should be performed to make a diagnosis. Typically, blood sampling shows leukocytosis and high C-reactive protein level. Plain abdominal radiography to detect free intra-abdominal gas is the first option when intestinal perforation is suspected. With a carefully executed radiographic technique, plain abdominal radiography can demonstrate as little as 1 mL of free gas on an erect chest or left lateral decubitus abdominal film. However, the sensitivity of plain abdominal radiography in detecting pneumoperitoneum has varied from 51% to 96% in various studies.⁹ When plain abdominal radiography does not reveal pneumoperitoneum, ultrasonography is a useful diagnostic modality. Intestinal perforation should be considered if ultrasonography reveals direct signs (e.g., an increased echogenicity of a peritoneal stripe associated with multiple reflection artifacts and characteristic comet-tail appearance) or indirect signs (e.g., thickened bowel loop and air bubbles in ascitic fluid or in a localised fluid collection, bowel or gallbladder thickened wall associated with decreased bowel motility or ileus).¹⁰ However, ultrasonography is less useful in the absence of direct or indirect findings of pneumoperitoneum. In this situation, CT can be used to confirm pneumoperitoneum. CT is considerably more sensitive than plain radiography is in detecting free intraperitoneal air. In addition, CT may provide direct visualisation of the perforation site.¹

Intestinal perforation requires early recognition and a prompt surgical intervention. The present case is a reminder that spontaneous intestinal perforation can occur in healthy people without any underlying diseases or other risk factors. If a patient with abdominal pain bends his or her body forward when walking or even refuses to walk, then spontaneous intestinal perforation should always be considered.

Conflicts of Interest Statement

The authors have no conflicts of interest relevant to this article.

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