



외상의 징후 없이 복통으로 내원한 소아: 췌장 손상 예측의 어려움

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Abdominal pain without bruising or sign of trauma: pancreatic injuries in children is difficult to predict

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Pancreatic injuries due to trauma in children are rare. An early diagnosis is difficult as the signs and symptoms are insidious, but delays in diagnosis can lead to significant complications. We report a case of a child who visited the emergency department with aggravating abdominal pain. The physicians first diagnosed the abdominal pain as being caused by a disease in the emergency department, but the patient was subsequently diagnosed with pancreatic injury. Clinicians should be aware of a possible trauma in children who complain of vague abdominal pain even in the absence of corresponding history.

Key words: Abdominal Pain; Amylases; Child; Emergencies; Lipase; Pancreas; Pancreatic Pseudocyst

Introduction

Abdominal pain is a common complaint in children visiting emergency departments (EDs)¹⁾. The etiologies differ by age groups, and the most

common ones are constipation, gastroenteritis, and viral syndrome²⁾. Among these etiologies, it is vital to distinguish benign gastrointestinal conditions from those requiring emergency surgery. Pancreatic injuries due to trauma, a cause of abdominal pain, are rare in children but have high morbidity and mortality³⁾. Also, pancreatic injuries can present with nonspecific manifestations, and delayed diagnosis and consequent delayed surgical treatment increase the risk of pancreas-specific morbidity and mortality. Furthermore, history taking in children is dependent on parents and children's expression about their symptoms, thus, is inherently less reliable. Therefore, finding a clue about symptoms and obtaining reliable

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information are important in children.

Here, we report a case of pancreatic injury presenting to the ED for abdominal pain without stated history of trauma. The case report was exempted by the Institutional Review Board with a waiver for the requirement of informed consent (IRB No. 2019-04-005).

Case

A previously healthy 5-year-old boy visited the ED for aggravated abdominal pain and vomiting. Two days earlier, he visited a local clinic because of 5 episodes of vomiting and abdominal pain. He took medication, but it did not work.

The initial vital signs were as follows: blood pressure, 90/40 mmHg; heart rate, 122 beats per minute; respiratory rate, 22 breaths per minute; and temperature, 37.9°C. His weight and height were 18.8 kg (25th–50th percentile) and 112.8 cm (12th–25th percentile), respectively. He was



Fig. 1. Plain abdomen radiograph showing no specific abnormal findings, such as free air.

conscious and looked acutely ill. The abdomen was soft and flat without mass. It revealed mild muscle guarding without rebound tenderness.

Initial laboratory evaluation showed a hemoglobin concentration of 12.3 g/dL, white blood cell count of 15,350/ μ L with 88.4% neutrophils, and a platelet count of $395 \times 10^3/\mu$ L. The concentrations of serum amylase and lipase were 849 U/L (normal range, 28–100 U/L) and 817 U/L (normal range, 15–70 U/L), respectively. Aminotransferases were within the normal range, and the C-reactive protein concentration was 96.83 mg/L (normal range, 0–5 mg/L). A plain abdominal radiograph showed no abnormal findings (Fig. 1). With a suspicion of pancreatic disease, we performed contrast-enhanced computed tomography (CT), showing a grade II pancreatic laceration (Fig. 2). On further inquiry specific to trauma, the boy's father stated that he fell off a television 2 days ago. The father thought that the accident was irrelevant to the abdominal pain.

After the intensive care unit hospitalization, the boy was kept nil per os with parenteral nutrition, correction of electrolyte imbalance, and nasogastric tube drainage. His symptoms resolved gradually, and general condition was improved. On day 8, second-look ultrasound ultrasonography for the lesion showed a 1 cm-sized pseudocyst in the



Fig. 2. Computed tomography of the abdomen showing a linear low attenuating lesion in the pancreatic tail with mild to moderate intraperitoneal fluid, indicating the grade II pancreatic laceration (white arrow).

pancreatic tail (Fig. 3). The pseudocyst was managed conservatively. He was discharged on day 17. At outpatient follow-up, his laboratory findings recovered to almost normal range. The following ultrasonography and CT showed improvement of the laceration and resolution of the pseudocyst.

Discussion

Blunt abdominal trauma is a critical cause of morbidity and mortality in children⁴. Although pancreatic injury rarely occurs, it is still the fourth most common cause of solid organ injuries in children, accounting for 3%–12% of all blunt abdominal trauma⁵. Previous series from Australia, North America, Japan, and the United Kingdom have reported that most injuries occur in boys and are related to bicycle handlebars⁶.

It is difficult to diagnose pancreatic injuries early due to vague manifestations and inaccuracy of imaging modalities. Characteristically, a pancreatic injury may follow relatively innocuous blunt abdominal trauma with a somewhat delayed presentation⁷. As few as 12% show abdominal bruising even in a significant injury, highlighting the need for early imaging studies⁸.

CT can provide a good overview of many types



Fig. 3. Ultrasonogram of the abdomen showing a 1 cm-sized pseudocyst in the pancreatic tail (white arrow).

of injuries, such as pancreatic injuries, and is often the imaging modality of choice. Although ultrasonography is commonly selected as the initial imaging modality in children with blunt trauma, the diagnostic accuracy for pancreatic injuries is poor, and the grading is based on CT findings. The Organ Injury Scaling Committee of the American Association for the Surgery of Trauma has been charged with devising an injury severity scoring system for individual organs to facilitate clinical research⁹. The American Association for the Surgery of Trauma Grading Scale encompasses a wide range of injuries from simple contusion (grade I–II) to complete rupture of the pancreatic duct and loss of parenchyma (grade III–V). Biochemical parameters, such as serum amylase and lipase, may support the clinical suspicion of pancreatic injuries, but have not been found to correlate with severity of the injuries.

Some authors advocate an entirely conservative approach for all grades of injury^{10–12}, whereas others recommend early selective pancreatic resection on the basis of CT findings alone⁷ or on the findings of acute endoscopic retrograde cholangiopancreatography^{13,14}. Grade I–II injuries can be managed conservatively. In a multi-institutional cohort of children with grade II–III injuries, operative and non-operative strategies appeared to have similar outcomes^{15,16}. Recently, there has been a trend toward non-operative strategy for pancreatic injuries without concomitant increase in morbidity or change in outcomes; this strategy can be safely followed for all grades.

Common complications of pancreatic injuries include fistula, pancreatitis, pseudocyst, abscesses, and duct stricture. Other less frequent complications include peritonitis, intestinal obstruction, gastrointestinal bleeding, endocrine or exocrine insufficiency, splenic artery pseudoaneurysm or rupture, and splenic vein thrombosis². Although pseudocysts heal spontaneously in 25%–50%, symptomatic lesions can be drained percutaneously, surgically or endoscopically¹⁷.

In conclusion, trauma can be a cause of abdominal pain in EDs, even without stated history of trauma. This case report shows that the diagnosis of pancreatic injuries can be difficult at presentation. Children with vague abdominal pain require detailed history taking and physical examination, and careful evaluation using image modalities.

Conflicts of interest

No potential conflicts of interest relevant to this article were reported.

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