Case Report

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A Rare Small Intestine Injury Without Free Gas Image on Radiological Imaging After Blunt Abdominal Trauma in A Child: Ileal Perforation

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Abstract

Introduction: Trauma continues to be one of the leading causes of death in children. Even though among traumas blunt abdominal trauma is frequently seen in children, small intestine injuries due to blunt abdominal trauma are very rare. In case the diagnosis of intestinal perforations is delayed and not treated rapidly, severe morbidity and mortality may develop.

Case Report: In this case, a 4-year-old male patient with ileal perforation, who applied to the emergency department with blunt abdominal trauma and did not show any signs of free gas in radiological imaging, was presented.

Conclusion: To the best of our knowledge, ileal perforation associated with blunt abdominal trauma is very rare in the literature. The aim of this case report is to emphasize the necessity of considering small intestine injury in the differential diagnosis of acute abdominal syndrome in children applying with blunt abdominal trauma.

Key Words: child, blunt abdominal trauma, small intestine injury, ileal perforation

Introduction

In the world, trauma is still one of the most common causes of death in childhood. In all periods of life, small intestine injuries associated with blunt abdominal trauma are rare, especially ileal perforation is a very rare. In the pediatric age group, spleen and liver injuries are observed after blunt abdominal trauma in general[1].

Small intestine perforations are generally determined by the findings of peritoneal irritation. In hollow-organ perforations in the abdomen, free gas image is generally seen in the abdomen in direct graphy[2].

The aim of this case report is to emphasize the necessity of considering small intestine injury in the differential diagnosis of acute abdumen, even if there is no free gas image on radiological imaging in children applying with blunt abdominal trauma.

Case Report

A four-year-old male patient applied to the emergency department due to the complaint of falling down from the height onto a hard floor. When the patient was examined at the emergency department, it was found that body temperature was 37.4 ^{O}C, blood pressure was 110/75 mmHg, pulse was 136/min, respiratory rate was 36/min.

In his physical examination, his consciousness was open and cooperated. In his abdominal examination, there was a four-cm wide ecchymotic area in the form of a strip under the umbilicus which went over the abdomen in the transverse plane, and palpation and percussion were normal. Other system examinations were normal. In his laboratory examination, hematological parameters, biochemical, coagulation and urinary tests were normal.

On the standing direct abdominal radiograph (SDAR), no free gas image was found (Figure 1). Thoracic and abdominal computerized tomography (CT) with non-contrast was assessed as normal. The patient was hospitalized at the department of pediatric surgery for follow-up.

He was started nutrition with oral liquid foods. He started to have significant tenderness under the umbilicus at deep palpation in the abdomen. Oral intake was terminated due to the onset of vomiting. In the second day of hospitalization, abdominal ultrasonograph (USG) and contrast-enhanced abdominal CT were conducted for the patient due to the development of an acute abdomen picture. In the USG, it was reported that ‘‘intestinal segments and mesenteric planes in the hypochondrium and pelvis were edematous”. In the CT, it was reported that “calibration increase in the ileal and jejunal loops, contamination was seen in the mesenteric fatty tissue at the right lower quadrant level, and no free gas image was observed”.

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Figure 1: Absence of free gas image on standing direct abdominal radiograph.

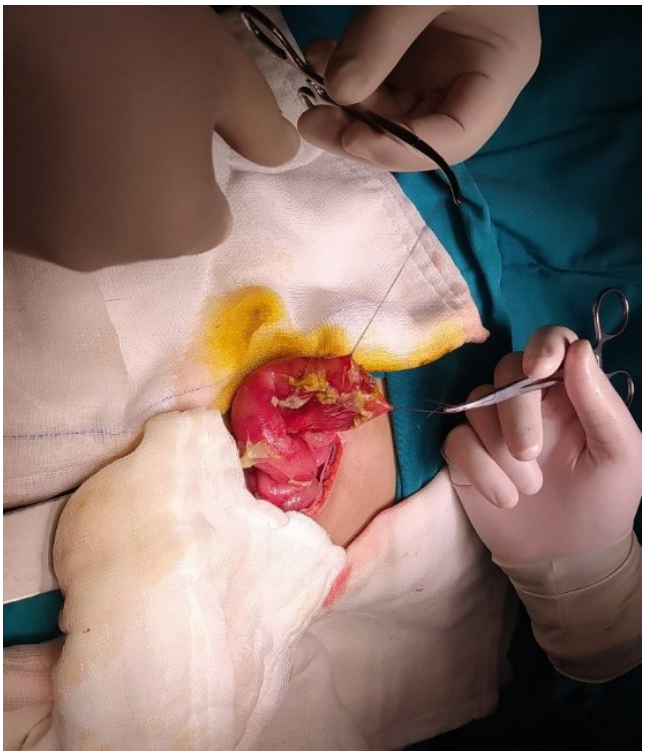

Figure 2: Image of ileal perforation during surgery.

Explorative laparotomy was performed 56 hours after the trauma. During laparotomy, 0.5-1 cm sharply-circumscribed perforation was detected approximately 15-20 cm proximal of the ileocaecal valve on the antimesenteric side in the terminal ileum.. Leakage here was circumscribed by small intestines. Other abdominal structures were found as normal (Figure 2). Perforation was primarily repaired. A drain was placed in the abdomen. On the 3rd postop day, the patient started oral intake and the drain was removed on the 5th postoperative day. The patient was discharged on the 10th postoperative day with full recovery.

Discussion

It is reported that small intestine injuries are about 1% of all the abdominal traumas[2,3]. Small intestine injuries were reported in 27 out of 2550 children with blunt trauma. Small intestine perforation was reported in only two of these 27 patients. The authors reported that the diagnosis of small intestine perforation in children is usually delayed, thus mortality and morbidity rates are higher[2].

The radiological finding of perforation in the traumas of hollow organs is generally the free gas image in the abdomen This image is usually observed in the subdiaphragmatic region in SDAR[4,5]. Since abdominal CT contains radiation, primarily abdominal USG is preferred. Most frequently encountered findings of perforation in abdominal CT are free gas image and the free contrast agent in the abdomen given via oral route. The absence of pneumoperitoneum does not exclude the hollow-organ perforation. Even a small amount of peritoneal fluid may be the only sign that indicates intestinal perforation[5,6]. In this case, pneumoperitoneum was not detected even though we made radiological imagings.

In blunt abdominal traumas, small intestine perforations have been generally reported on the antimesenteric side of the small intestine[5]. As in the current case, diagnosis of small intestine perforations in blunt abdominal traumas is usually delayed[2,3,7,8]. In their study, Holland et al.[7] stated that the mean surgical intervention period of small intestine perforations in children was 29 hours. In the current case, this period was 56 hours. In patients with blunt abdominal trauma, close monitorization of the patient and performing the physical examination again guide the diagnosis and treatment and also prevent delayed treatment[5].

Conclusion

Children applying with blunt abdominal trauma should be followed closely. Although the radiological images are normal, it should be considered that small intestine injury may be present in the differential diagnosis in such patients. If the diagnosis of intestinal perforations is delayed and not treated rapidly, severe morbidity and mortality may develop.

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