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ISOLATED GASTRIC PERFORATION SECONDARY TO BLUNT TRAUMA IN A BOY: A RARE INJURY NOT TO BE MISSED.

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ABSTRACT

Accidental injuries in children are a common presentation in the primary care clinic. This includes blunt abdominal trauma, which could go unrecognised and cause severe sequelae. A good focused history taking, especially on the mechanism and force of injury coupled with careful physical examination, is crucial to excluding the possibility of internal viscus injuries. We present a case of an isolated gastric perforation, a rare injury secondary to blunt trauma, in a boy who presented with subtle signs and symptoms.

Keywords: Gastric perforation, blunt abdominal trauma, children, lesser curvature perforation, primary care.

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Accidental injuries in children are a common presentation in the primary care clinic. This includes blunt abdominal trauma, which could go unrecognised and cause severe sequelae. A good focused history taking, especially on the mechanism and force of injury coupled with careful physical examination, is crucial to excluding the possibility of internal viscus injuries. We present a case of an isolated gastric perforation, a rare injury secondary to blunt trauma, in a boy who presented with subtle signs and symptoms.

Keywords: Gastric perforation, blunt abdominal trauma, children, lesser curvature perforation, primary care.

INTRODUCTION

Blunt abdominal trauma in children is not uncommon. It accounts for about 90% of abdominal injuries in children and is the most common cause of unrecognised fatal injury.¹⁻² This may result from a motor vehicle accident, sports injury, fall from height, fall onto an object like a bicycle handlebar or even physical abuse.³ Recognising a hollow viscus injury following a blunt trauma can be difficult in children. This could be possible due to the absence of a telltale sign at the initial presentation, misinterpretation of symptoms and mis-

communication between physician and child, causing underestimation of severity.⁴ Most of these injuries are subtle and may not lead to hemodynamically unstable conditions, thus it may lead to under recognition. Delay in presentation and diagnosis of blunt trauma-related injuries may contribute to significant morbidity and mortality.⁵ We present a case of a blunt abdominal injury in a young boy who presented with mild symptoms with normal findings at the initial presentation.

CASE REPORT

An 11-year-old boy presented to the primary care clinic with left hypochondriac pain after an alleged fall from his bicycle when his abdomen hit the road kerb. He had no medical ill-

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ness. On examination, his vital signs were normal; his blood pressure was 100/70 mmHg and his pulse rate was 95 beats per minute. Abdominal examination revealed tenderness over his left hypochondriac region with mild guarding. No abrasion wound nor bruises were noted. He was subsequently referred to the tertiary centre, given suspicion of abdominal blunt injury.

Initial assessment using Focused Assessment with Sonography for Trauma (FAST) of the abdomen in the emergency department showed no injuries to the solid organs and no free intrabdominal fluids. The chest and abdominal radiograph revealed no significant findings and no free gas under the diaphragm. Laboratory investigations revealed that the full blood count and liver function test were normal.

However, the child was still in pain despite the analgesics given and developed involuntary guarding. An urgent CT abdomen revealed multiple air pockets within the peritoneal cavity (Figure 1). No dilated bowel loops were seen. There were no wall thickening or other abnormal small or large bowel findings. The liver, spleen, kidneys, and pancreas were normal. Based on the findings, an urgent laparotomy was done. During the laparotomy, there was a 2 cm perforation at the

stomach body, which was 2 cm from the lesser curvature (Grade 2), with a small amount of contamination seen in the peritoneal cavity. The small and large bowels were normal. The perforation was sutured with an omental patch. Subsequently, the child was discharged with good recovery on day five post-op.

DISCUSSION

Hollow viscus injury is rare, especially in children. The paediatric-age group are more prone to abdominal blunt injury than adults since their abdominal wall is thinner; they have a relatively flat diaphragm and more flexible ribs.⁶ Gastric perforations following blunt abdominal trauma are rare, accounting for less than 2% of all blunt abdominal injuries. The anterior gastric wall is cited as the commonest perforation site, followed by the greater curvature, lesser curvature and posterior wall.⁶

As illustrated in our case, the child presented with subtle symptoms and signs after a fall from his bicycle. He had mild abdominal pain with normal vital signs and normal blood investigations. This presentation could be challenging for the attending physician, especially in primary care and emergency physicians, to make a diagnosis. Despite

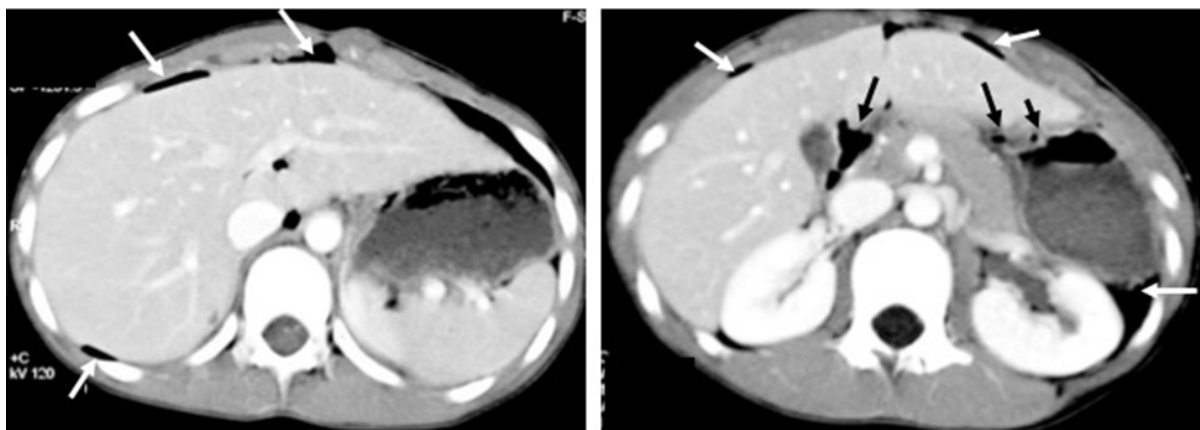


Figure 1: Contrast-enhanced CT scan of abdomen in axial plane soft tissue window at the level of stomach region showing multiple foci of free air (white and black arrows) seen surrounding the liver, the stomach and at porta hepatis region.

being hemodynamically stable, a diagnosis of possible viscus injury should be made, given the history of the mechanism of injury. Findings on physical examination that may suggest organ injuries include persistent abdominal tenderness, abdominal ecchymoses, upper abdominal swelling or signs of peritonism.¹

A few studies have been done to help better identify children with the possible risk of blunt abdominal injuries. History, physical examination and investigations have been considered to predict blunt abdominal injuries. A study conducted by Hynick et al showed that low systolic blood pressure, abdominal tenderness, serum AST > 200U/L or ALT >125U/L and initial hematocrit less than 30% were found to be predictors of increased risk of abdominal injuries.⁷

In our case, the mechanism of injury, persistent abdominal pain, tenderness and abdominal guarding warranted further investigations. Nonetheless, serum amylase was not done in our case. The role of serum amylase in predicting abdominal injury is unclear. In some studies, the results have been controversial, where it may or may not predict an abdominal injury.⁶

Focused Assessment with Sonography for Trauma (FAST) is a useful initial tool for detecting abdominal injury. However, a normal finding does not exclude an abdominal injury, as in this case. FAST examination in children can be specific but, at times, cannot detect free intraperitoneal fluid such as haemothorax and haemoperitoneum. The utility of FAST is limited in view that less than half of paediatric patients with abdominal injury have fluid which is reflected in this case.⁶

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The presence of free air almost always indicates the perforation of a viscus. Even though it was reported that as little as 1

ml of free gas could be demonstrated on a plain radiograph, the radiograph should be done with adequate techniques by using a proper erect position chest radiograph or left lateral decubitus abdominal radiograph. The patient should remain in the position for 5-10 minutes before taking the horizontal radiograph. This ensures enough time for free air to travel and rise to the highest location. However, this may be limited when assessment is done in a paediatric patient leading to a false negative result.⁹

Use of Computed Tomography (CT) scan remains the gold standard in investigating blunt abdominal injury in children. As shown in this case, multiple air pockets indicated extraluminal air in the CT abdominal scan. It is reported that the presence of extraluminal air carries about 30-60% sensitivity but 95% specificity of viscus injury.¹⁰ It provides more information and can reveal any other associated solid organ or bony injuries associated with gastric rupture. However, high radiation, risk of malignancy due to unnecessary radiation exposure, the need for sedation and difficult accessibility in some places may hinder its use.

Nonetheless, as illustrated in this case, the hollow viscus perforation treatment principle is urgent surgery to prevent the risk of sepsis and peritonitis. The main aim is to control the source of peritoneal contamination and to secure haemostasis⁶. In our case, this patient had Grade 2 American Association for the Surgery of Trauma (AAST) Abdominal Upper Gastrointestinal Injuries.¹¹ In this classification, injuries are graded into 5 categories based on the type of injury, site of injury (stomach or duodenum) and extent of the injury. This classification is essential to guide surgeons to repair the injury.

CONCLUSION

In conclusion, gastric perforation due to blunt

trauma is an uncommon injury in children with subtle signs that may present to the primary care at the initial presentation. A high clinical index suspicion with accurate, focused history, especially the mechanism of injury and thorough physical examination, are important for early diagnosis. Hence, we suggest a low referral threshold for further clinical evaluation and observation after a blunt trauma injury in children.

CONFLICT OF INTERESTS

No potential conflict of interest relevant to this article was reported.

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