CASE REPORT

Melaena as the presenting symptom of gastric mucosal injury due to blunt abdominal trauma

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Emerg Med J 2006;23:e34 (<http://www.emjonline.com/cgi/content/full/23/5/e34>). doi: 10.1136/emj.2005.033621

Blunt abdominal trauma is a common cause of admission to the typical trauma centre. Hollow viscus injury from blunt trauma, however, is unusual and rarely involves the stomach. A 15 year old boy sustained a bicycle handle bar injury to the abdomen and presented to the casualty department four days later with melaena. A computed tomography (CT) scan of the abdomen showed normal findings but endoscopy revealed two "kissing" areas of mucosal ulceration on the anterior and posterior wall of the gastric antrum. The patient received a blood transfusion for anaemia but was otherwise treated conservatively and made a full recovery. The authors believe this to be the first reported case of melaena as the primary presenting symptom of gastric ulceration secondary to blunt abdominal trauma. Diagnosis of hollow viscus injuries due to blunt abdominal trauma requires a high index of suspicion and thorough investigation, particularly if the presentation is delayed.

A 15 year old boy presented to the casualty department with a three day history of melaena. He had fallen from his bicycle four days earlier. The cycle's handle bar had struck his epigastrium. The accident occurred several hours after his last meal. He had not experienced any other injuries and did not attend the hospital at the time of the accident. However, subsequently in the next three days he noted five episodes of black tar-like stools. He then told his parents about the accident and was brought to the hospital.

On examination the patient was comfortable with a blood pressure of 115/70 mm Hg and a heart rate of 105 beats per minute. The anterior abdominal wall was superficially bruised at the site where he had been hit by the cycle's handle bar (fig 1). He had epigastric and left upper quadrant tenderness with localised guarding. A rectal examination revealed melaena. On initial investigations his haemoglobin was 9.6 g/dl and haematocrit was 0.29. No abnormalities were detected on an erect chest x ray and computed tomography (CT) scan of the abdomen. The patient was transfused two units of blood, and he underwent endoscopy of the upper gastrointestinal tract the following day. This revealed two "kissing" areas of mucosal ulceration on the anterior and posterior walls of the gastric antrum, but no active bleeding (fig 2). He was treated conservatively with a proton pump inhibitor and made full recovery. His post-transfusion haemoglobin level remained stable and he was discharged three days after admission.

DISCUSSION

Blunt abdominal trauma is one of the commonest causes of admission to a trauma centre. In one study of 275 557 trauma cases, 83% were due to blunt trauma, and 31% of patients required abdominal investigation.¹ Hollow viscus injury (HVI) resulting from blunt abdominal trauma,

however, is rare and represents approximately 1% all cases.¹⁻² Patients with HVI due to blunt trauma are more likely to die of their injuries than patients without HVI even when the severity of the injury is comparable.¹ Furthermore, delay in diagnosis of a major HVI is associated with increased morbidity and mortality.¹⁻³

The commonest site of HVI is small bowel (>90% of cases), whereas injuries to the stomach are rare and represent less than 10% of all HVIs due to blunt trauma.¹⁻⁴ HVIs in the stomach are associated with the highest mortality of all HVIs, perhaps because, as the stomach is highly mobile and in a relatively protected position, high forces are required to injure the stomach.¹ The accurate and early diagnosis of stomach injury due to blunt abdominal trauma is therefore of critical importance. We present what we believe is the first reported case of melaena as the main presenting symptom of blunt gastric injury.

Injuries to the stomach may be classified as grade I–V according to the Gastric Organ Injury Scale, where grade I represents contusion, haematoma, or partial thickness laceration, and grade V represents tissue loss or devascularisation of more than two thirds of the stomach.⁵ As in the present case, most stomach injuries are grade I (>60%), and full thickness laceration or rupture occurs in less than 40% of all cases.⁶⁻⁷

Isolated gastric injury due to blunt trauma is rare and most patients have concomitant injuries to visceral organs (most commonly liver, spleen, or pancreas), the thorax, or the extremities.⁴⁻⁷ Patients with gastric rupture are more likely to have a full stomach at the time of impact than those with partial thickness laceration.⁴⁻⁷ The commonest site of gastric rupture is the anterior wall followed by the greater

Figure 1 This patient presented with melaena four days after a bicycle accident. The site where he was struck by the cycle's handle bar is visible on the anterior abdominal wall. Photo reproduced with permission.

Figure 2 Endoscopy revealed two "kissing" areas of mucosal ulceration on the anterior and posterior walls of the gastric antrum.

curvature.⁴⁻⁸ Partial thickness laceration is more commonly observed on the lesser curvature followed by the anterior wall.⁷

When the stomach is distended by a recent meal, blunt trauma to the upper abdomen is more likely to lead to an increase in gastric pressure to cause rupture.⁷ Other modes of stomach injury in blunt trauma are deceleration and crush injuries.⁴⁻⁸ In crush injuries, the impact force compresses the stomach against the vertebral column. This mode of injury may explain the pattern of mucosal damage noted in our patient, who probably had an empty stomach. The force of impact in our patient was focused in a small area of approximately 10 cm² on the abdominal wall, and this may account for the apparent lack of injury to other organs. Bicycle handle bar injuries account for 12–14% of blunt abdominal injuries in children and are the commonest mechanism of injury that result in delayed presentation to hospital.²

The diagnosis of gastric mucosal injury should be considered in stable patients with melaena following blunt abdominal trauma. It is important, however, that concomitant full thickness HVI (that is, rupture) and visceral organ injury is investigated by x rays and abdominal CT, although

negative findings must be interpreted with caution and in the context of the clinical findings. Endoscopic examination is appropriate for the diagnosis of suspected gastric mucosal injury in a stable patient with equivocal clinical signs. In addition, it may allow intraluminal bleeding to be controlled if necessary.

Gastric injury after blunt abdominal trauma is potentially fatal and its diagnosis requires a high index of suspicion and careful clinical assessment and investigation. Gastric mucosal injury in a stable patient may be treated conservatively with close clinical observation and repeated radiological or endoscopy assessment if necessary.

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Competing interests: none declared

Informed consent was obtained from the patient and his parent for publication of this case report.

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Accepted for publication 19 December 2005

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