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Chief Complaint: abdominal pain

Case History: CB is a 17 y/o soccer goalkeeper who is participating in the State Cup Soccer Championships (a spring tournament for club soccer teams, no affiliation with high school team, however her high school team physician happened to be the event physician). She was playing in the last 15 minutes of the game and dove to grab a ball. As she landed, an opposing player missed the soccer ball and kicked CB in the abdomen. CB finished the last 15 minutes of the game and then presented to the medical tent with complaints of sharp abdominal pain.

She localized her pain to the midepigastric area, she denies radiating pain. No other complaints. She thinks the pain has worsened slightly since the time of injury. No nausea or vomiting.

As this was her last game of the day she and her mother are anxious to start the 2 hour drive home.

Review of Systems:
Entirely negative, including no recent illness such as sore throat, fevers, mononucleosis, gastrointestinal symptoms. No history of constipation. Menses are regular, most recent period about 2 weeks ago. Denies sexual activity.

Past medical history: Minor musculoskeletal injuries: patellofemoral pain, Grade one AC joint sprain.

Medications: Rare use of anti-inflammatory medications for pain, none in last 2-3 weeks.

Allergies: no known drug allergies

Family History: Paternal grandfather died of cerebral aneurysm in his 30s. Maternal grandmother diagnosed with arthritis in her teens. Family history also positive for several members with high blood pressure and high cholesterol.

Social history: denies tobacco/alcohol use. Currently, a senior in high school.

Initial physical exam:
General Appearance: mildly uncomfortable in appearance. Slightly more uncomfortable when asked to change positions. Cooperative, appropriate affect.

Body Habitus: Tall (6’1”), Thin and muscular (no scale available in medical tent)

Vitals: Pulse: 80 Blood Pressure 119/78 Respiratory Rate: 12

Abdominal Exam: Visual inspection: no asymmetry, distension, bruising or signs of trauma noted.
**Auscultation:** bowel sounds present.

**Palpation:** Tenderness to palpation in the epigastric region, otherwise non-tender. Minimal guarding. No rebound.

**Rectal/pelvic exam:** not performed due to setting.

**Clinical Course:**
Due to her symptoms CB was asked to stay in medical tent for 15-30 minutes before driving home so that repeat exam could be performed. She complied (somewhat reluctantly) and repeat exam was performed in 30 minutes.

**Repeat exam:**
**General Appearance:** mildly uncomfortable.

**Vital Signs:** Pulse 75 Blood Pressure 118/75 Respiratory rate 13

**Abdominal exam:** Increased tenderness to palpation in the epigastric region, now with mild diffuse tenderness throughout the abdomen. Mild-moderate guarding. Mild rebound tenderness has developed.

**Auscultation:** bowel sounds present (subjectively, felt to be less than previous exam)

As auscultation was finished patient sat up complaining of nausea and vomited blood.

Patient was transported to a nearby children’s hospital, via ambulance that was on site, where she was admitted to the Pediatric Intensive Care Unit.

**Initial Hospital Testing:**
**Radiographic studies:**
Initial abdominal x-rays and ultrasound were unremarkable.
Initial non-contrast CT: interpreted as normal

**Laboratory studies:** cbc, full chemistry panel, urinalysis were normal.

Overnight her pain continued to worsen and repeat CT with contrast was performed the next morning revealing perforation of the duodenum.

The duodenum was surgically repaired and CB remained hospitalized for 7 days at which time she was discharged and able to travel home.

At initial follow-up at home with her high school team physician, two weeks after injury, she had lost 16 pounds and still felt fatigued. She was tolerating 2 small meals each day and was having occasional emesis after eating. She also complained of significant postural lightheadedness.

Four weeks after her injury she was evaluated by a surgeon in her home town (not the operating surgeon). At that point she had regained 2 pounds and was tolerating 2-3 meals a day with no emesis for 10 days. She still had mild postural lightheadedness. She had some granulation tissue in the mid-portion of her scar that was treated with silver nitrate.
Eight weeks after her injury she was again evaluated by her high school team physician. She had regained 12 pounds and was completely symptom free. After discussion with general surgeon, she was cleared to begin a gradual return to activity, a detailed activity program was provided. She successfully returned to full training over the summer and competed the following fall with a division I NCAA soccer team.

**Discussion:**
Duodenal rupture is an uncommon injury in sports. Six case reports were found in the literature; only one involved a soccer player. The others involved cycling (fall onto handle bars), hockey, skating and American football (Houshian).

In 1982, Bergqvist et al described 136 abdominal injuries occurring during sports over a 30-year period of time. Only three of these injuries were small intestinal and all were repaired primarily without complication. In a series of 16 cases of blunt gastrointestinal trauma in pediatric patients over a 7 year span, Galifer et al. identified 14 small intestinal ruptures, five of which were duodenal ruptures. Motor vehicle collisions are the most common cause of small bowel rupture, and sporting activities are much less common (Ballard, Galifer).

Early reports of duodenal trauma cited high mortality rates of up to 32% (Corley). However, more recent reports cite 0-4% mortality rates (Bergqvist, Snyder, Ballard, Galifer). The establishment of intensive care/trauma units has been cited a reason for this improvement in mortality rate (Corley).

The diagnosis of duodenal and other small bowel rupture can be difficult. Early vital signs can be normal and early symptoms minimal, as in this case. Thus, in patients with a mechanism that suggests possible serious injury; repeat examination is important to reveal worsening or evolving symptoms. Significant abdominal pain, guarding and rebound tenderness, are the most common symptoms in duodenal rupture and should alert the examiner to possible serious injury (Ballard). At least one other case study of small bowel rupture in a hockey player documented a normal initial CT scan and a in a series of 18 duodenal ruptures who received CT scan, four of theses CTs were interpreted as normal (Hunt, Ballard). In our case, initial non-contrast CT was normal, but repeat CT with contrast about 24 hours after injury revealed the diagnosis. Thus, persistent and worsening abdominal pain after blunt trauma warrants further investigation.

**References:**


