

CASE: 29 year old man crashed dirtboarding 1 week ago and now presents with 3 days of worsening dull, diffuse abdominal pain. He is nauseated, denies vomiting or diarrhea, bloody or melanic stools. He is most comfortable curled on his side. No fevers/chills, no focal weakness/numbness. He is afebrile, HR 113, BP 125/81, R 24, sat 97% RA. Abdomen: guarding, tenderness to palpation throughout, no rebound; normal bowel tones. Normal rectal exam, heme negative. WBC 15, HCT 41. Abdominal trauma series: no free air/obstruction. What is the differential?

Recognizing the Surgical Abdomen

Audrey Young, MD

Harborview Medical Center

Clinical Findings: Gather history, particularly exacerbating and alleviating factors; bowel function; fevers. Evaluate vitals, especially with movement: is the patient hemodynamically stable? Check for peritoneal signs, that include severe tenderness, ‘electric-shock’ like sensation, guarding, and rebound. Tachycardia may be an early sign of impending catastrophe. Serial abdominal exams are key to tracking progression, particularly worsening, of an acute abdomen. Concerning labs include elevated WBC, low hematocrit, low or dropping bicarbonate, increased creatinine, and increased lactate.

Differential Diagnosis: Consider potentially life-threatening diagnoses first

1. Abdominal aortic aneurysm (AAA) – Clinical features include abdominal pain radiating to the back or back pain, hypotension, pulsatile mass. Free fluid seen on abdominal trauma ultrasound or CT (ultrasound usually faster).
2. Perforation – rigid abdomen and free air on plain films; elevated WBC and lactate; low bicarbonate.
3. Mesenteric ischemia/infarction – Consider especially in elderly or patients with vascular disease; infarction presents with diffuse pain, sometimes out of proportion to exam, and rigid abdomen; ischemia often presents as pain after meals, weight loss, nausea, vomiting. Diagnose by colonoscopy or angiography.
4. Splenic and liver lacerations – Trauma-related, so common at Harborview. Clinical findings including diffuse abdominal pain can be up to 7-10 days after injury when initial clot is reabsorbed and patients hemorrhage. Hematocrit is often low or falling. Diagnose by ultrasound then diagnostic peritoneal lavage; surgical emergency.

➤ Use focal complaints and findings to narrow your differential

- LUQ – gastritis and gastric ulcer; splenic infarct or abscess
- RUQ – cholecystitis, cholangitis, budd-chiari syndrome, empyema, subdiaphragmatic abscess, acute hepatitis.
- Epigastric – peptic ulcer, ruptured AAA, pancreatitis, GERD, myocardial infarction
- Periumbilical – appendicitis, gastroenteritis, bowel obstruction, ruptured AAA
- RLQ – appendicitis
- LLQ – diverticulitis
- BLQ – ectopic pregnancy, salpingitis, incarcerated inguinal hernia, inflammatory bowel
- Diffuse pain – mesenteric ischemia, bowel obstruction, peritonitis, gastroenteritis, metabolic derangement

Diagnosis

Assessment of vital signs are critical. Tachycardia may be a concerning early sign.

1. **Careful abdominal exam first.** Repeat exams frequently to elicit worsening of clinical condition. Perform pelvic exam in young females with acute abdomen.
2. **Laboratory tests may identify location of pathology, and may give early indication of clinical worsening.** LFTs can identify hepatic or biliary dysfunction; amylase and lipase may identify acute

pancreatitis. Urine tests for gonorrhea/chlamydia may be helpful in appropriate setting. Again, WBC, lactate, hematocrit, and bicarbonate can all be early signs of clinical worsening.

3. **Use radiologic studies judiciously:** Plain films are good for ruling out perforation, obstruction. Upright films are much more sensitive than portable for free air. Ultrasound is easily obtained in Emergency Room; is good for evaluating lower abdominal pain in women, biliary tree pathology, and free abdominal fluid. Abdominal CT is most sensitive if broad differential. CT is better than ultrasound for appendicitis. CT not reliable for biliary stones (misses 25%); does not evaluate female organs well. MR may be a better test for female reproductive tract.

Management: Management varies by diagnosis – see topic-specific web pages. Contact surgeons immediately in frank peritonitis or any life-threatening disorders, that include leaking AAA, perforation, mesenteric ischemia, solid organ lacerations, and ectopic pregnancy. Indications for rapid surgical intervention include bleeding ulcer not controlled via endoscopic plus medical therapy, deep abscess, and appendicitis. Contact surgery about any intestinal obstruction that does not improve with conservative therapy in 48-72 hours, or if signs of hemodynamic instability, peritonitis, or mesenteric ischemia. Contact obstetrics regarding PID. Contact surgery prior to discharge in cholecystitis or gallstone pancreatitis for elective cholecystectomy.

Case Follow Up: The patient had moderate temporary relief from toradol, but abdominal pain worsened through the first hospital day. Hematocrit dropped from 41 to 28 in 12 hours. Repeat WBC was 14 K. Vital signs remained within normal limits except for a borderline high heart rate. Ultrasound of the abdomen was performed and showed a large amount of free intraabdominal fluid. Surgery performed emergency exploratory laparotomy and discovered old blood throughout the peritoneum and a splenic tear. Patient received splenectomy and recovered uneventfully.

Clinical Pearls

- Patients with acute abdomen are sometimes admitted to medicine. Some will need surgery!
- Perform serial examinations frequently especially when the patient is sick, and when the clinical trend is uncertain. Small changes in vital signs, urine output, exam and laboratories may be very important. Vital signs subtle as in exam and labs may be early indicators of impending catastrophe.
- Always consider life-threatening causes of acute abdomen.
- Contact surgeons early if you are concerned about acute abdomen.

References

1. Gupta H, Dupuy DE. Advances in imagining of the acute abdomen. *Surgical Clinics of North America*, 1997. 77;1245-63.
2. Martin RF, Rossi RL. Abdominal Emergencies: Has anything changed? *Surgical Clinics of North America*, 1997. 77; 1228-1243.

Last updated: July 31, 2006/AY/AS