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101 Clinical Cases in Emergency Room

SECOND EDITION



Badar M Zaheer

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CHAPTER 3

Abdomen

CASE STUDY 29: UPPER GASTROINTESTINAL BLEED

CASE HISTORY

A 45-year-old investment banker presents with an episode of black vomit. He has been experiencing stomach pains for weeks, often after he finishes a meal. He wakes up at night with burning chest pain and describes a foul taste in the morning. The patient also complains of bloating and fullness. His job has been stressful, as the economy has been taking massive downturns. He describes himself as an easily stressed person. The patient has had tension headaches for many years that he usually responded by using a few capsules of Advil. The patient also admits that he has been feeling weak and a reduced sex drive.

PHYSICAL EXAMINATION

Patient is tachycardic. Abdomen examination shows tenderness in the epigastrium.

Laboratory Tests

Low hematocrit. Hypochromic anemia.

Imaging

Endoscopy: Gastric ulcer.

DIAGNOSIS

The patient is suffering from upper gastrointestinal (GI) bleeding secondary to nonsteroidal anti-inflammatory drug (NSAID) overuse.

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DISCUSSION

Before the details of the case are discussed, it is helpful to define a number of terms:

- *Hematemesis*: Vomiting of blood
- *Coffee ground emesis*: Vomiting of blood that has been broken down by stomach acid, which shows the color of oxidized heme
- *Hematochezia*: Presence of fresh blood in stool
- *Melena*: Presence of digested blood in stool.

This is a case of upper GI bleeding. The presence of "coffee ground" emesis, epigastric discomfort, and history of stress and NSAID use highly suggest an upper GI bleed before endoscopic confirmation of a gastric ulcer. Upper GI bleed refers to any bleeding above the ligament of Treitz of the duodenum. The form of blood in either emesis or stool can give clinicians clues as to where the location of bleeding may be, even within the scope of upper GI bleeding. In the case of "coffee ground" emesis, an upper GI bleed is most likely. The bleed is unlikely to be in the esophagus due to its oxidized nature. If it is a gastric bleed, the bleeding may be low-grade, which allows blood the time to be oxidized. In contrast, the presence of hematemesis suggests bleeding in the esophagus or heavy bleeding in the lower upper GI tract.

The forms of blood in stool are also helpful in diagnosing GI bleeds. In the case of melena, the bleeding location is likely to be upper GI due to the fact that the blood had the time to pass through the GI system to be digested. If hematochezia is present, the bleeding is likely to be in the lower GI due to its proximity to the anus. Hematochezia may also occur with severe upper GI bleeding, in which the volume of blood overcomes the digestive capacity of the system. In such cases, the patients are likely to exhibit signs of hypovolemia, anemia, and even shock.

There are many causes of upper GI bleeding. Gastric ulcer secondary to NSAID use is a prevalent problem. NSAIDs inhibit cyclooxygenases, which are responsible for producing prostaglandins that protect the gastric mucosa. Another common cause of gastric ulcer is *Helicobacter pylori (H. pylori)* infection. The bacterium erodes the mucosa, allowing gastric acid to further damage the underlying gastric and duodenal tissues. Ulcers may also result from heavy alcohol consumption, in which the alcohol irritates the gastric mucosal lining and causes acid damage. Other causes of upper GI bleeding include Mallory–Weiss syndrome, cancer, and esophageal/gastric varices.

The diagnosis of GI bleeding is through upper endoscopy. Endoscopy can verify the presence and site of the bleed and perform coagulation therapy (Fig. 1). Nasogastric tube may also be used to aspirate gastric content to determine if blood is present (to differentiate between lower GI bleeding). Other diagnostic tests, such as hemoglobin, hematocrit, colonoscopy, and stool occult blood, are also helpful in differentiating upper GI bleed from other diagnoses.

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Fig. 1: Endoscopy showing deep gastric ulcer.
Source: http://www.cleanandsoberlive.com/stomach-pain-after-drinking-its-probably-gastritis/.

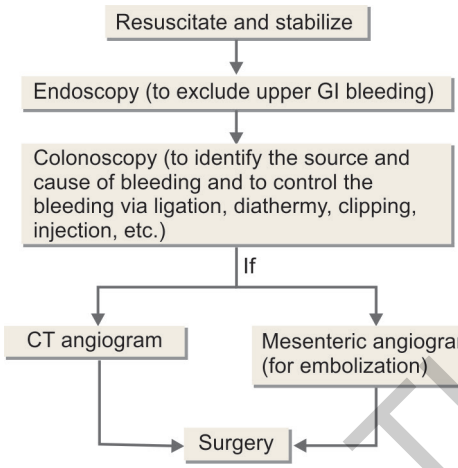
The first priority of treatment of an upper GI bleed is resuscitation and stabilization if the patient is hemodynamically compromised. The subsequent management depends on the severity and the underlying cause of bleeding. Active bleeding is treated with endoscopy with coagulation to stop the bleed. If the bleeding cannot be stopped with endoscopic procedures, surgery would be the next step (Flowchart 1). Pharmacological interventions may follow to treat the underlying cause of the bleed. In the case of *H. pylori* infection, a proton pump inhibitor and combinations of antibiotics are necessary. Octreotide is used to treat esophageal or gastric varices.

Depending on the comorbidities and rate of blood loss, transfusions are almost necessary if the hemoglobin (Hgb) is <7 g/dL (Fig. 2).

1. Sometimes when Hgb <10, patient may require transfusions.
2. If patient is thrombocytopenic, they may require platelet transfusion.
3. If patient has international normalized ratio (INR) >1.5, you should administer fresh frozen plasma.

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Flowchart 1: Lower gastrointestinal bleeding management.



Modified from: http://www.slideshare.net/sirajshiferaw/agi-bleedingseminar.

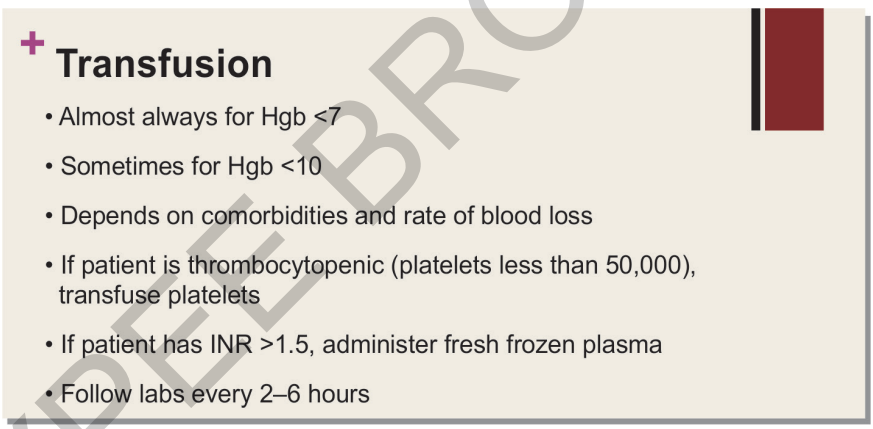


Fig. 2: Criteria for transfusion of blood.
Source: Gastrointestinal emergencies. 2nd edn. ISBN: 978-1-405-14634-0.

4. Continue to follow laboratories ever 2–6 h.

For very severe hemorrhage, prophylactic antibiotics can be administered to reduce the morality.

FURTHER READING

1. Gastrointestinal emergencies. 2nd ed. ISBN: 978-1-405-14634-0.
2. http://www.slideshare.net/sirajshiferaw/agi-bleedingseminar.

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CASE STUDY 30: DIVERTICULITIS

"If you believe the patient has appendicitis on the left side, you are most likely dealing with diverticulitis"

—Badar M Zaheer

CHIEF COMPLAINT

An 84-year-old postmenopausal white female with abdominal and flank pain.

CASE HISTORY

An 84-year-old lady with a history of smoking presents to the emergency room (ER) early in the morning with sudden constant left lower quadrant (LLQ) pain that radiates to the groin with an onset of 3 h. Current pain level is 2–3/10 and maximum was 10/10. Last bowel movement was 20–25 min prior to arrival which was normal but thinner. She presents with a mild fever, but no chills, sweating, chest pain, nausea, and vomiting. No diarrhea or constipation was noticed. Nothing seems to exacerbate or relieve her symptoms.

PAST SURGICAL HISTORY

Right hip surgery.

DIAGNOSTIC TESTS

- CBC—Patient has 16,000 white blood cell (WBC) count with shift to the left.
- Abdominal X-rays—Not useful
- Barium enema—Outdated and not useful
- Computed tomography (CT) abdomen—Preferred choice. Highly sensitive and specific (Figs. 1 and 2)
- Ultrasound—Safe, less invasive, low cost, but operator dependent and not as accurate as CT. Not a useful tool for surgical planning.

DISCUSSION

Many people have small pouches in the lining of the large intestine that bulge outward through weak spots. The small pouches are called diverticula, and the condition of having diverticula is called diverticulosis. As we age, this condition becomes more prominent.[1]

In 10–25% of people with diverticulosis, the pouches become inflamed. Acute diverticulitis is the most common complication of diverticular disease,

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Fig. 1: Computed tomography scan shows abdomen with sigmoid wall thickening and adjacent fat stranding.
Courtesy: Badar M Zaheer, MD, Chicago, USA.



Fig. 2: Computed tomography scan shows severe diverticulitis with perforation. This patient presented with abdominal pain, fever, and rebound tenderness.
Courtesy: Badar M Zaheer, MD, Chicago, USA.

but 20% of the patients with diverticular disease may also develop other complications, such as infection, abscess, fistula, obstruction, perforation, or even diverticular bleeding. Patients usually present with visceral abdominal pain and tenderness localized to the area of maximal inflammation.

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Nausea, vomiting, and altered bowel habits often occur. There may also be rectal tenderness, fever, and leukocytosis.

MANAGEMENT

In mild cases, where the patient has the ability to tolerate oral intake, he or she can be treated as an outpatient. Put the patient on clear liquid diet and a broad spectrum antibiotic for 7–10 days (amoxicillin–clavulanate, trimethoprim–sulfamethoxazole, or fluorquinolone and metronidazole), and discharge home for a close follow-up.

Patients suffering from a severe attack of diverticulitis may require hospitalization. The patient must be put on analgesia, bowel rest, intravenous fluid, and a broad-spectrum antibiotic for anaerobes and gram-negative rods for 7–10 days. Anaerobes are treated with metronidazole or clindamycin. Gram-negative rods are treated with aminoglycoside, monobactam, or third-generation cephalosporins (Tables 1 and 2).

Pericolic abscesses are drained under CT or US guidance. The patient may also be treated with conservative methods, as those stated above.[2]

Treatment focuses on clearing up the inflammation and infection, resting the colon, and preventing or minimizing complications. Gradually increasing the amount of high-fiber foods in the diet will help in recovery.

Table 1: Medications.

Time	*Medication*	*Dose (mg)*	*Route*	*Site*
08:07	Zofran	4	IV	LW
08:13	Morphine sulfate	2	IV	LW
08:45	Nitro patch	0.4	TOP	Left Chest
09:45	Ativan	0.3	IV	LW
10:06	Zofran	4	IV	LW
10:20	Compazine	5	IV	LW
11:25	Tylenol	650	PR	
12:05	Motrin	400	PO	

Table 2: IV medication infusion.

Time	*Solution/Medicine Type*	*Rate (mL/h)*	*Stop time*	*Amount infused*
10:20	0.97 NS1 Med.	200		
10:25	Rocephin, 1 GM 1 Med.	200	10:50	100
10:51	Gentamicin, 125 mg 1 Med.	300	11.20	100
11:20	0.9% NS Pump	999	11:45	300
11:46	0.9% NS Pump	999	11:59	300

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PHYSICAL EXAMINATION

General Appearance

The patient is alert, oriented and not in acute distress.

Head, Eyes, Ears, Nose and Throat (HEENT)

There is no evidence of trauma, tumors, facial edema, goiter, or thyroid nodules. Pupils are equal, round, reactive to light, and accommodation (PERRLA) and sclera icterus. Ear, nose, throat (ENT) inspection is normal. Pharynx is normal. The neck is supple.

Cardiovascular System

Regular rate and rhythm. S1 and S2 are normal.

Respiration

Breath sounds are normal.

Abdominal

- Soft, tenderness in LLQ
- Normal bowel sounds. No abdominal bruit. No pulsatile mass. No hepatosplenomegaly.

Skin

Color is normal. No rash. Warm and dry.

Extremities

Nontender, normal range of motion (ROM), no pedal edema, no joint effusions, rashes, or cyanosis.

Laboratory

Complete blood count (CBC), comprehensive metabolic panel (CMP), amylase, lipase, blood culture and sensitivity (C&S) × 2 sites, urinalysis (UA), blood culture × 2.

Results

White blood cell (WBC): 15.5.
Platelets (PLT): 265.

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Normal chemistry.
Lipase and amylase are normal.
UA: WBC: 10–25, UA: Bacteria + 1.

Procedures

- *Portable chest X-ray* (*CXR)*: Normal; normal bowel gas
- Flat and upright abdominal X-ray
- *CT*: Abdomen and pelvis, oral and IV contrast (*see* Figs. 1 and 2).

DISPOSITION

Discharge Vitals

BP: 109/70 mm Hg, HR: 123 bpm, RR: 24 breaths/min, *T*: 102°F, and SaO_2: 96%. Pain: 4/10.

Impression

Diverticulitis: LLQ (radiates to groin), leukocytosis, and fever.
For most definitive diagnosis: CT.

Computerized Tomography

- Diverticula, thickened colonic wall >4 mm
- Inflammation within pericolic fat more or less
- Collection of contrast material or fluid.

Differential Diagnosis

- *Sepsis*: Fever, leukocytosis, HR >90 bpm, RR >20 breaths/minute, WBC count <4,000 or >12,000 is a sign of sepsis
- *Acute urinary tract infection*: Dysuria, urinary frequency, pyuria, hematuria, bacteriuria, foul, and cloudy urine
- *Acute pyelonephritis*: Fever, dysuria, vomiting, flank pain, U/A: WBC, white cell casts
- *Inflammatory bowel syndrome*: Abdominal pain, vomiting and diarrhea, rectal bleeding, internal cramps/muscle spasms in pelvic region, weight loss, arthritis, pyoderma gangrenosum, and primary sclerosing cholangitis
- *Acute appendicitis*
- *Sigmoid malignancy*
- *Ovarian cyst*
- *Endometriosis*
- *Pelvic inflammatory disease.*

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Treatment

One of the following course of treatment is followed.

- *Antibiotics*: Ciprofloxacin and metronidazole
- Ampicillin or sulbactam and piperacillin or tazobactam
- Gentamicin and cefotetan or cefoxitin.

Mild Disease

Oral antibiotics: Amoxicillin/clavulanic acid (Augmentin)

DISCUSSION

True Diverticulum

Sac-like herniation of entire bowel wall.

Pseudodiverticulum

- Mucosa protrusion through muscularis propria of colon is the most common.
- *Protrusion point*: Nutrient artery (vasa recti) penetrates through muscularis propria
- Break in integrity of colonic wall
- *Common site*: Sigmoid colon, 1/20: pancolonic diverticula
- *Cause*: The main cause is higher amplitude contractions and constipated, high-fat content stool within sigmoid lumen.

DIVERTICULITIS

- Inflammation of diverticulum
- Retention of particulate material within diverticular sac and fecalith formation
- Compression or erosion of vasa recti causes bleeding indicates perforation.

Acute Uncomplicated Diverticulitis

Presentation: Fever, LLQ abdominal pain, anorexia/obstipation, generalized peritonitis (diverticular perforation)
Examination: Abdominal distension and signs of localized or generalized peritonitis
Laboratory: Leukocytosis.

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Diagnosis

Computerized tomography

- Sigmoid diverticula, thickened colonic wall is >4 mm
- Inflammation is within pericolic fat.

Contraindications for Testing in Acute Diverticulitis

- Barium enema or colonoscopy in acute setting for fear of perforation and pertonitis
- Perform 6 weeks after diverticular disease to rule out sigmoid malignancy.

Complicated Diverticulitis

- *Presentation*: Abscess > perforation > stricture > fistula
- *Perforation staging*: Hinchey classification system, predict outcome of postoperative management
- *Fistula formation*: Cutaneous, vaginal, vesicle fistulae, stool passage through skin or vagina, air in urinary stream (pneumaturia)
- *Colovaginal fistulae*: More common in women with history of hysterectomy.

MANAGEMENT

- Radiographic and hematologic confirmation of inflammation or infection within the colon
- Initially with antibiotic and bowel rest
- Three-fourth of hospitalized acute diverticulitis patients respond to antimicrobial regimen
- Trimethoprim/sulfamethoxazole or ciprofloxacin
  - + Metronidazole: Aerobic gram-negative rods + anaerobic bacteria
  - + Ampicillin: If not responding
- *Single agent*: 3G penicillin, IV piperacillin, oral penicillin/clavulanic acid
- *Duration*: 7–10 days.

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1. Destigter KK, Keating DP. Imaging update: acute colonic diverticulitis. Clin Colon Rectal Surg. 2009;3:147-55.
2. Kaltenback T, Soetikno R. Diverticular disease. In: Gastrointestinal Emergencies. 2nd ed. Hoboken, New Jersey: Blackwell Publishing Ltd. 2009.

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CASE STUDY 31: ACUTE PANCREATITIS

CASE HISTORY

A 45-year-old female patient presents with pain that started suddenly in the epigastric region while she was sitting at work. Pain is sharp 8/10 and radiates to the back. Since the onset of the pain, patient has had three episodes of non-bloody, non-bilious vomiting. Patient has never had pain quite like this before, although she states that she has had several episodes of right upper quadrant (RUQ) pain for which she was told that she should eventually have her gallbladder taken out. Past medical history is significant for gastroesophageal reflux disease (GERD) for which she takes omeprazole. Her only past surgery was a tubal ligation after her third pregnancy. She does not smoke, drink alcohol, or use any other recreational drugs. On physical examination, patient is afebrile with a blood pressure of 156/95 mm Hg, heart rate 108 bpm, respiratory rate 18 breaths/min, and oxygen (O_2) saturation of 100% on room air. What is the most likely diagnosis? What testing would help confirm your suspicion?

DISCUSSION

The most likely diagnosis is gallstone pancreatitis. The patient's epigastric abdominal pain radiating to the back is characteristic of pancreatitis. The patient's history of biliary colic suggests gallstones are the cause. Lipase or computed tomography (CT) of abdomen could confirm pancreatitis. Aspartate aminotransferase/alanine aminotransferase (AST/ALT), alkaline phosphatase, electrolytes, complete blood count (CBC), and urinalysis (UA) should also be obtained. Urine pregnancy test in women of child-bearing age should be obtained. Other causes of the patient's abdominal pain that should be considered are biliary colic, cholecystitis, cholangitis, peptic ulcer disease, and ulcer perforation.

Acute pancreatitis is an inflammatory disease of the pancreas that is associated with little or no fibrosis of the gland. It has high morbidity and mortality rates contributing to 300,000 hospital admits per year as well as 20,000 deaths. The exact mechanism is unknown and varies with a specific cause. In general, it is thought that there is an activation of digestive zymogens inside acinar cells that leads to injury. In addition, there is activation of inflammatory mediators. If severe, this can lead to systemic inflammatory response syndrome (SIRS) and multiorgan failure or local necrosis of the pancreas.

Typical presentation includes abdominal pain in 95% of cases. The pain is most likely to have a sudden severe onset that is either located in the epigastric region, RUQ, or less commonly the left upper quadrant (LUQ). The pain has a tendency to radiate toward the back due to the retroperitoneal positioning of the pancreas. The quality is usually boring and deep, alleviated

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by resting in the fetal position and exacerbated by eating and drinking alcohol. In 90% of cases, there are associated symptoms of nausea and vomiting. Often patients feel restless and agitated. In the cases of biliary pancreatitis, the exception is that the pain may come on more gradually and be more localized to the RUQ.

The physical examination depends on the severity of the attack. Mild disease will cause mild abdominal tenderness, whereas severe disease will cause severe tenderness and guarding in the upper abdomen. Generally, no rebound tenderness is present. In terms of vitals, patients are usually tachycardic. Mild hypotension may be present due to sequestration of fluid in the pancreatic bed. Low-grade fevers are present without evidence of infection in 60% of cases. Respirations are generally rapid and shallow. Signs suggestive of severe disease include Grey Turner sign and Cullen sign. Grey Turner sign consists of ecchymoses in the flanks that are indicative of hemorrhage from hemorrhagic pancreatitis. Cullen sign is ecchymoses in the periumbilical region that is similarly suggestive of intra-abdominal hemorrhage. Other associated findings that are suggestive of peripancreatic spread of inflammation include generalized ileus, signs of pleural effusion, subcutaneous fat necrosis, and jaundice.

Expected laboratory findings include leukocytosis, mild hyperglycemia, mild increase in AST/ALT from alcoholic pancreatitis, large increase in AST/ALT from biliary causes. More importantly, serum lipase has a high sensitivity of 90% and high specificity when elevated up to two times normal. Serum amylase is sensitive but not specific for pancreatitis unless three times normal. Other pancreatic enzymes can be measured but generally not done clinically.

Abdominal CT is the most accurate for diagnosing pancreatitis and identifying its localized effects. CT abdomen should be done when you are uncertain or the diagnosis, suspect complications, or in cases of mild-to-moderate disease that do not improve over several days. Intravenous (IV) and oral contrast should be used. Findings on imaging will include pancreatomegaly, peripancreatic streakiness, or "dirty fat," necrotic areas that fail to enhance. CT severity index may be used as an aid in prognosis. Other methods of imaging that may be used are abdominal X-ray, ultrasound, and magnetic resonance cholangiopancreatography (MRCP). Abdominal X-ray is often used to rule out perforation. Findings include dilated loops or air-fluid levels secondary to paralytic ileus, sentinel loop, colon cut-off sign, widening of the C-loop, and calcifications of the gallbladder. Ultrasound may provide evidence of the cause of pancreatitis and may aid in ruling out gallstones. It is often difficult to identify the pancreas due to overlying intestinal gas or fat. If able to visualize, a hypoechoic and enlarged pancreas may be present. MRCP is useful for the select patient populations: pregnancy, contrast allergy, and renal insufficiency. It is most accurate for visualizing bile and pancreatic ducts and pancreatic fluid collections. This test may be most useful while awaiting endoscopic retrograde cholangiopancreatography (ERCP) for definitive management.

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Badar M Zaheer is a board-certified emergency medicine physician with 30 years of practice in rural to urban settings with experience applicable to a wide range of clinical environments. He has extensive experience teaching all types of medical providers, from students and residents to nurses and paramedics. In this book, emergency medical concepts are explained in an easy-to-understand manner and may be implemented by practitioners of all medical.

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