Biliary colic typically results in severe upper abdominal pain, where the patient moves around in an attempt to escape it. One of the “cholic demons” in George Cruikshank’s print stands poised to plunge a spear into the tormented victim to stop her from struggling.

If a patient with biliary colic has their pain made significantly worse by movement, then this is a sign that “the spear of the demon” has been plunged and that cholecystitis may be present.
**Introduction**

Cholelithiasis is a common presentation in the ED.

Cholelithiasis presents to the ED as **acute biliary colic**, caused by a gallstone impacting within the **cystic duct**.

The major challenge is to ensure that the patient does not have a serious secondary complication, including:

- Cholecystitis
- Pancreatitis
- Cholangitis.

It is also important to rule out other more serious conditions, such as myocardial ischemia.

**See also separate document on:**

- Choledocholithiasis (in General Surgical Folder)
- Acute pancreatitis, (in General Surgical Folder)
- Acute Cholangitis, (in General Surgical Folder)
- Sonography of the Gallbladder, (in Radiology Folder)

**Epidemiology**

Around 10-15 % of Western adults will develop cholelithiasis, (gallstones).

Gallstones are less common in African and Asian populations.

Women are effected more often than men.

**Pathophysiology**

**Gallstone types:**

Gallstones are generally of three types:

- Cholesterol stones:
  - ♥ In the Western world, these make up about 80% of all gallstones.

- Bile pigment stones:
  - ♥ Due to hemolysis.
Mixed stones:

- A combination of bile pigment and cholesterol.

These components can precipitate out to form crystals when bile is concentrated in the gallbladder. These small crystals can grow to form biliary "sludge" and then ultimately, biliary stones.

**Risk factors:**

Risk factors include:

- Women in pregnancy or on the oral contraceptive pill.
  
  Women at particular risk are those:
  
  - On the oral contraceptive pill
  - Who are pregnant.

  The increased risk in women is thought to be due to the presence of endogenous sex hormones that can enhance cholesterol secretion and so increase bile cholesterol saturation

- Family history/ genetic predisposition.

- Increasing age

- Obesity:
  
  - The Rubensesque idyll of womanhood and favourite mnemonic of medical students - the five "fs" - is frequently invoked in association with this particular risk factor: *Fair, fat, fertile, female* and *forty*.

- Diabetics.
- Some drugs:
  
  - Exogenous estrogens, clofibrate.

**Complications:**

**Acute**

Acute complications of gallstones may include the following:

- Acute cholecystitis.
- Acute pancreatitis.
- Obstruction with jaundice.
- Ascending cholangitis.
Chronic complications of gallstones may include the following:

- Mucocele (sterile) or empyema (infected)
- Erosion of a stone into adjacent bowel and subsequent “gallstone ileus”

**Clinical Features**

Up to two thirds of cases of cholelithiasis are asymptomatic.

Of those who do become symptomatic:

1. **GIT upset:**
   - Nausea, vomiting and anorexia are common.

2. **Pain:**
   - RUQ pain (more often constant rather than colicky), with radiation to the right scapula.
   - The pain of biliary colic typically resolves within **four to six hours**.
   - It generally occurs **following a meal** (particularly a fatty one), when the gallbladder contracts resulting in occlusion of the cystic duct by a stone leading to severe visceral pain. On eventual relaxation the stone falls back into the gallbladder and pain resolves.

3. **Look for signs of inflammation to help rule out acute cholecystitis:**
   - Fever
   - In contrast to cholecystitis, patients may be uncomfortable and move around. In cholecystitis there is inflammation and peritonism and patients will tend to remain still as movement will aggravate this pain.
   - Significant RUQ tenderness, (positive Murphy’s sign)
   - Rebound
   - Guarding (voluntary or involuntary)

**Investigations**

It is important to ensure that the patient with seemingly straightforward biliary colic does not in fact have associated cholecystitis or pancreatitis.
**Blood tests:**

1. FBE
   - WCC be useful when cholecystitis needs to be ruled out.

2. CRP
   - May be useful when cholecystitis needs to be ruled out

3. U&Es and glucose

4. **Lipase**
   - This is important to ensure that the patient does not have any associated pancreatitis.

5. LFTs

**ECG:**

- This is important in cases where the clinical picture is less clear cut. This is to help rule out possible myocardial ischemia as the cause of the symptoms.

**CXR / AXR:**

- Consider these again primarily to rule out other pathology.
- Only about 10-15 % of gallstones, are visible on plain radiographs, *(see appendix 1 below)*

Some of these stones will have a “laminated” appearance, which will help distinguish it on occasions from a renal stone on plain x-ray.

**Ultrasound:**

This is the investigation of first choice.

- This is not necessarily an urgent investigation, unless a serious secondary complication such as cholecystitis is being considered or the patient is generally unwell or jaundiced.
- The ultrasound may be done in the ED if there are staff trained staff to do this, otherwise it may be done electively after the acute episode has settled,
- Note that previous cholecystectomy, does not rule out the possibility of gallstones as symptoms may be due to choledocholithiasis (a gallstone within the common bile duct).

**CT scan**

This is not the ideal investigation for gallstones, as it is not adequately sensitive.
It does have some use in patients with complications, such as acute cholecystitis.

It can detect dilation of the bile ducts, pneumobilia, gangrene and perforation of the gallbladder.

It is also useful for the detection of unexpected extrabiliary pathology.

**Management**

1. **Nil orally:**
   - This may prevent the release of cholecystokinin and so reduce gallbladder contraction.

2. **IV fluids:**
   - IV fluids may be necessary if there has been significant associated vomiting /fasting or for prolonged attacks.

3. **Analgesia:**

   The best options include:
   - **Morphine:**
     - 2.5 to 5mg IV as an initial dose, then titrated to effect every 5 to 10 minutes with further incremental doses of 2.5 to 5mg IV.

     In elderly patients or those with cardiorespiratory compromise, an initial morphine dose of less than 2.5mg IV and incremental doses of 0.5 to 1mg should be considered.

     If morphine is contraindicated, consider fentanyl at 25 to 50 micrograms IV as initial equivalent dose.

   - **Ketorolac as an IM dose**
     - Ketorolac 10 to 30 mg IM, 4-to 6-hourly, up to a maximum of 90 mg daily.

     For patients older than 65 years, use ketorolac 10- 15 mg IM, 4-6 hourly, up to a maximum of 60 mg daily.

     Ketorolac should not be prescribed for longer than 5 days.

See Analgesic Therapeutic Guidelines for full prescribing details.

Also note the following:

- Buscopan may be adequate in mild cases, however there is no good evidence base for its efficacy in biliary colic.
There is no evidence to support the preferential use of pethidine in gallbladder or pancreatic disease. Additionally pethidine is best avoided because of its greater potential for addiction.

4. Surgery:

- Definitive management is most commonly by laparoscopic cholecystectomy or using a limited small incision technique.

  If there is scarring from previous surgery, then open cholecystectomy may be necessary.

  Early cholecystectomy is now preferred as this reduces subsequent morbidity.

- Choledocholithiasis, is usually managed via ERCP.

Disposition:

Most cases of uncomplicated biliary colic can be treated in the ED then discharged for an outpatient ultrasound.

Patients with recurrent presentations to the ED should have early surgical review.

In some cases admission may be necessary.

Indications for admission include the following:

- Intractable pain.
- The diagnosis is not clear.
- Complicating acute pancreatitis.
- Suspicion of the development of cholecystitis or cholangitis:

  ♥ Note that for cases of persistent pain, (greater than 4 -6 hours) there must be a high index of suspicion for early cholecystitis, even if blood tests are normal and there is no significant tenderness.

  ♥ The absence of physical findings does not necessarily rule out the diagnosis of early cholecystitis. Many patients present with diffuse epigastric pain without localization to the RUQ.

  ♥ In these cases the patient should be admitted to a short stay unit in order to get an ultrasound to help rule out early cholecystitis.
Appendix 1

Anatomy of the biliary tree:
Appendix 2

Plain radiography:

Two large gallstones on Plain AXR in 91 year old female. Only about 15% of gallstones are radio-opaque on plain radiographs.

Ultrasound:

Typical ultrasound appearance of a gallstone, with acoustic shadowing.
“Venus at her Mirror”, oil on canvas, c. 1615, Peter Paul Rubens

The Rubensesque idyll of womanhood and favourite mnemonic of medical students - the five “fs” - fair, fat, fertile, female and forty - is frequently invoked in association with the risk factors for gallstones. Here the Baroque master, Peter Paul Rubens, shows us a typical candidate for a severe attack of the biliary colic!
References


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