APPROACH TO PATIENT WITH ABDOMINAL TRAUMA

(VISCERAL ORGANS)

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Introduction-براء المسلوقي

-leading cause of death

-May not manifest during the initial assessment & treatment period .

Epidemiology

-Peak incidence abdominal trauma is 15-30% years.
-Injury accounts for 10 %of all deaths .
-prevalence: 13%

Types of trauma


Blunt
trauma

PENETRATING-STAB

PENETRATING-GUN SHOT

Pre-hospital care

Goal: to deliver the pt. to hospital for definitive care as rapidly as possible “scoop & run .“

Initial assessment & resuscitation

- Primary survey (emergency care)
- Secondary survey

AMPLE Hx .

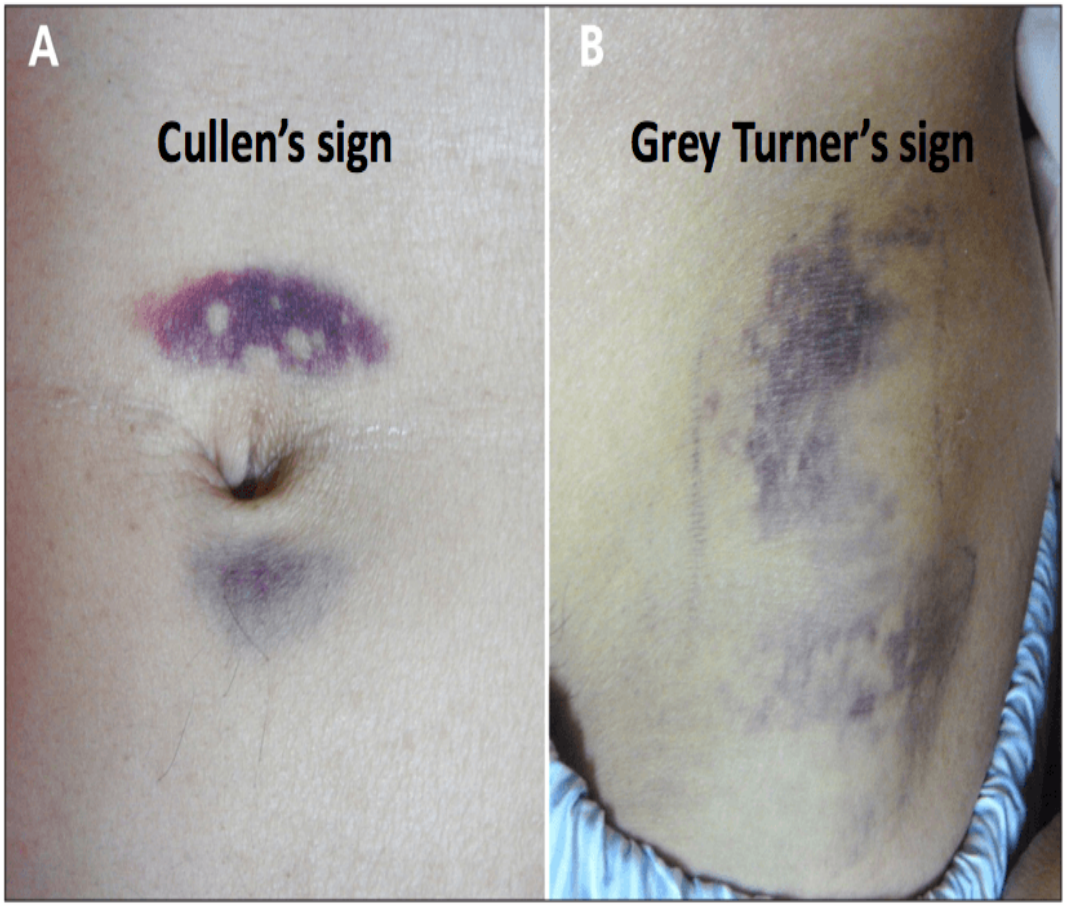
-**A**: allergy
-**M**: medications
-**P**: past medical hx .
-**L**: last meal .
-**E**: event (what happened)

Examination-
Inspection

1. laceration
2. abration
3. entry/exit wounds
4. involvement chest & head injury

Seat belt sign

Cullen's sign & Grey turner's sign

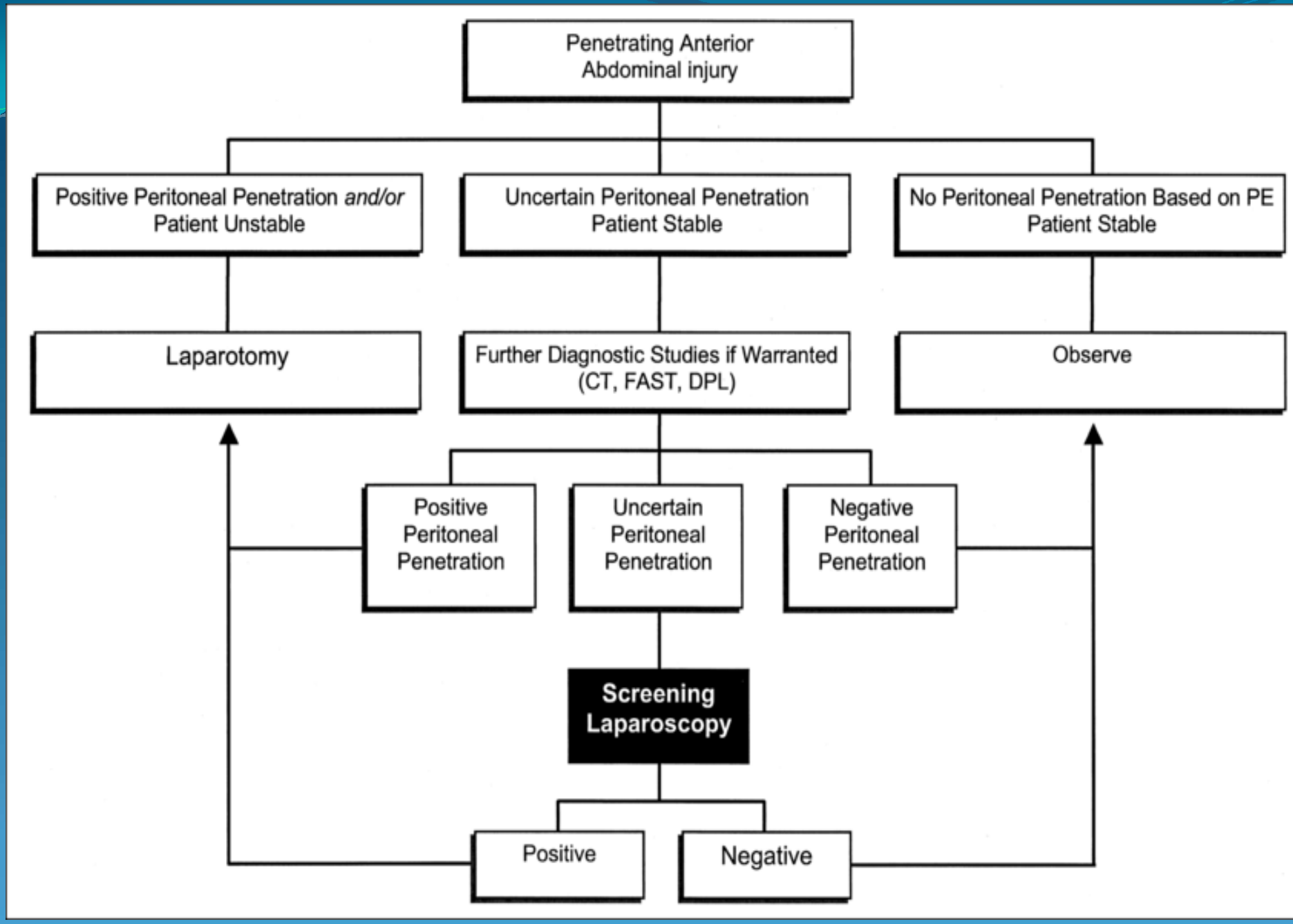


Auscultation

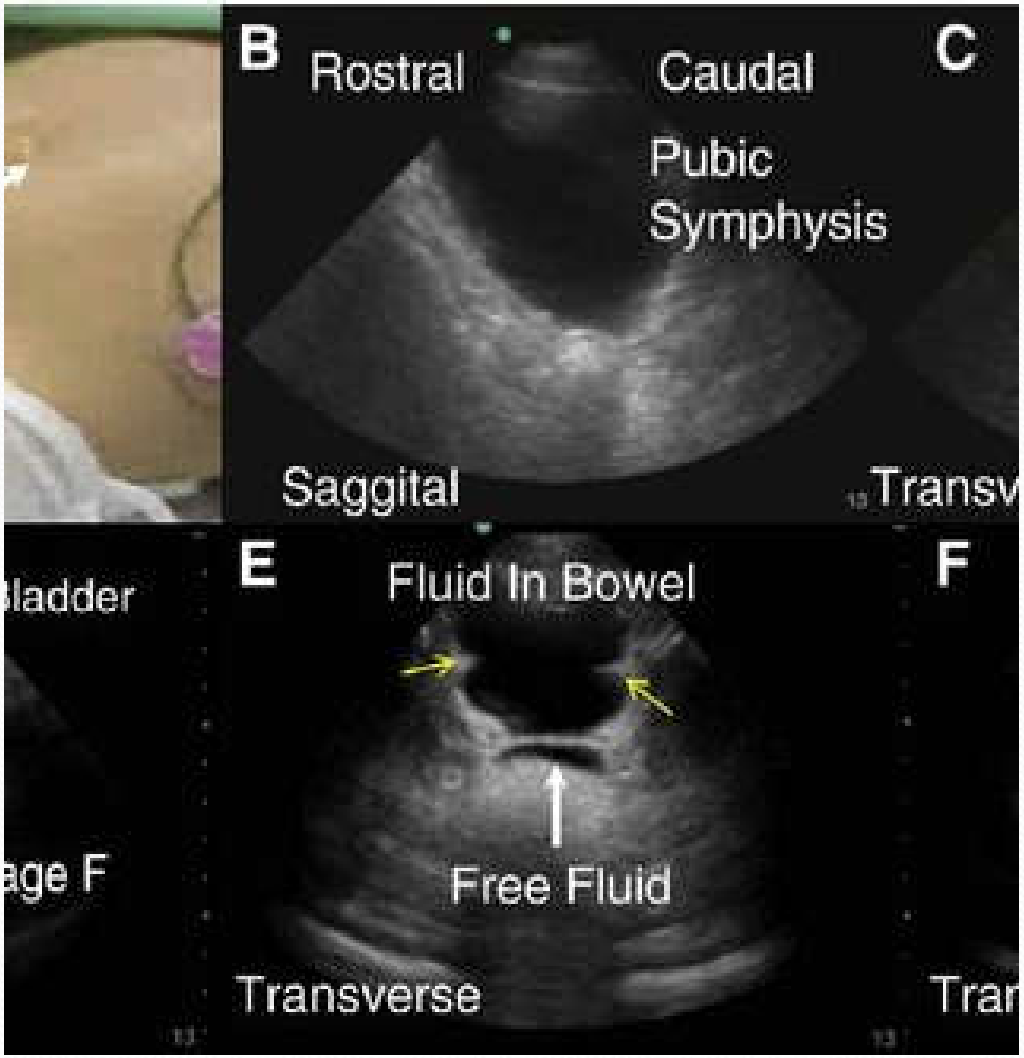
1. Bowel sounds in the thoracic cavity)diaphragmatic rupture)
2. Haemothorax .

Palpation

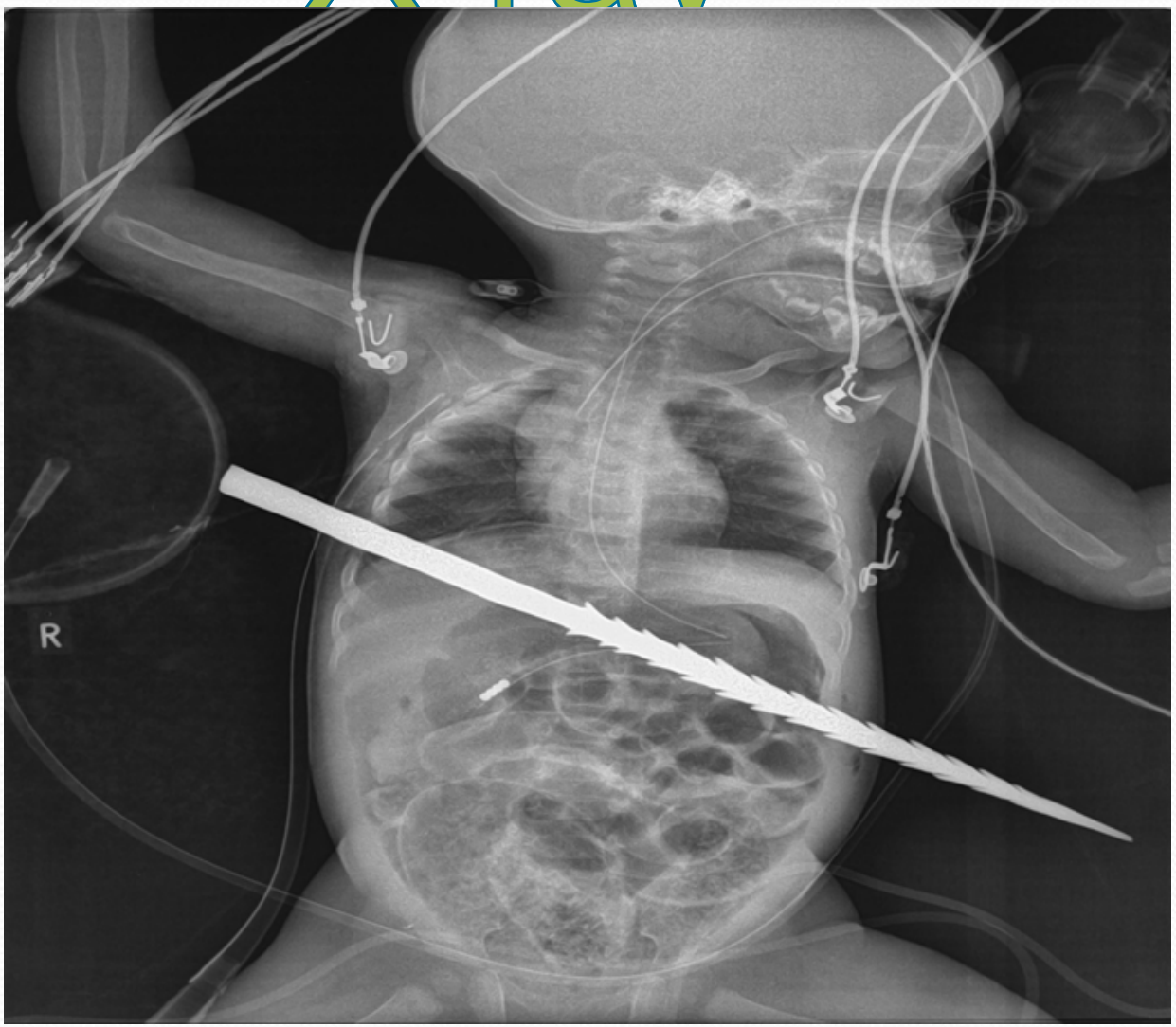
1. Mass
2. Tenderness
3. Signs of peritonitis
4. #ribs
5. Chest & pelvic compression test


Penetrating Anterior Abdominal injury
Positive Peritoneal Penetration *and/or* Patient Unstable
Uncertain Peritoneal Penetration Patient Stable
No Peritoneal Penetration Based on PE Patient Stable
Laparotomy
Further Diagnostic Studies if Warranted (CT, FAST, DPL)
Observe
Positive Peritoneal Penetration
Uncertain Peritoneal Penetration
Negative Peritoneal Penetration
Screening Laparoscopy
Positive
Negative

FAST


B
Rostral
Caudal
C
Pubic
Symphysis
Saggital
Transv
E
Fluid In Bowel
F
Free Fluid
Transverse

X-ray



USG

Advantages

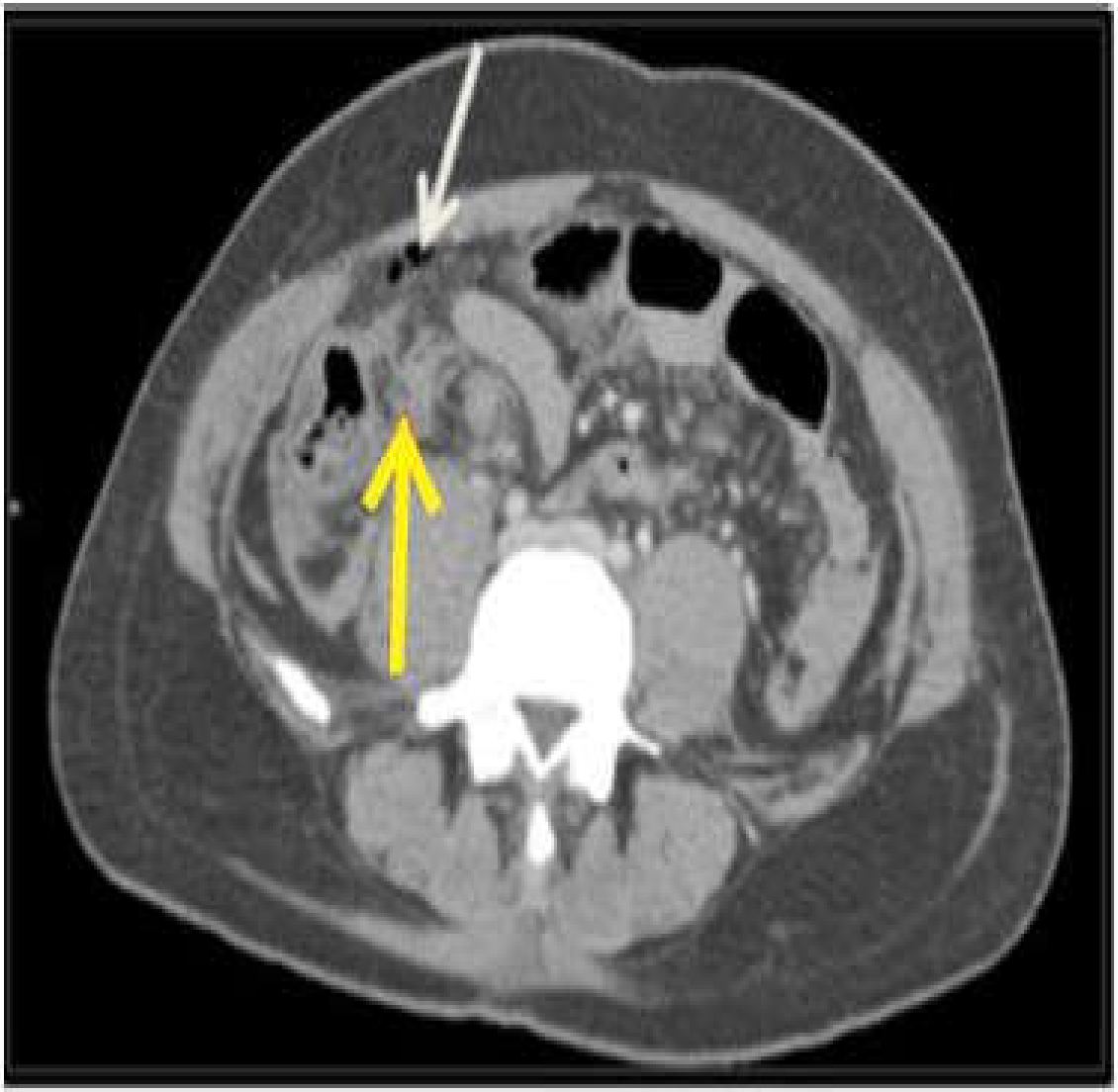
1. Easy & early to diagnose
2. Noninvasive
3. No radiation exposure
4. Resyscitation/emergency room
5. Low cost

USG

Disadvantages

1. Examiner dependent
2. Obesity
3. Gas interposition
4. Low sensitivity for free fluid less 500ml
5. False-negative retro peritoneal & hollow viscous injury

CT scan



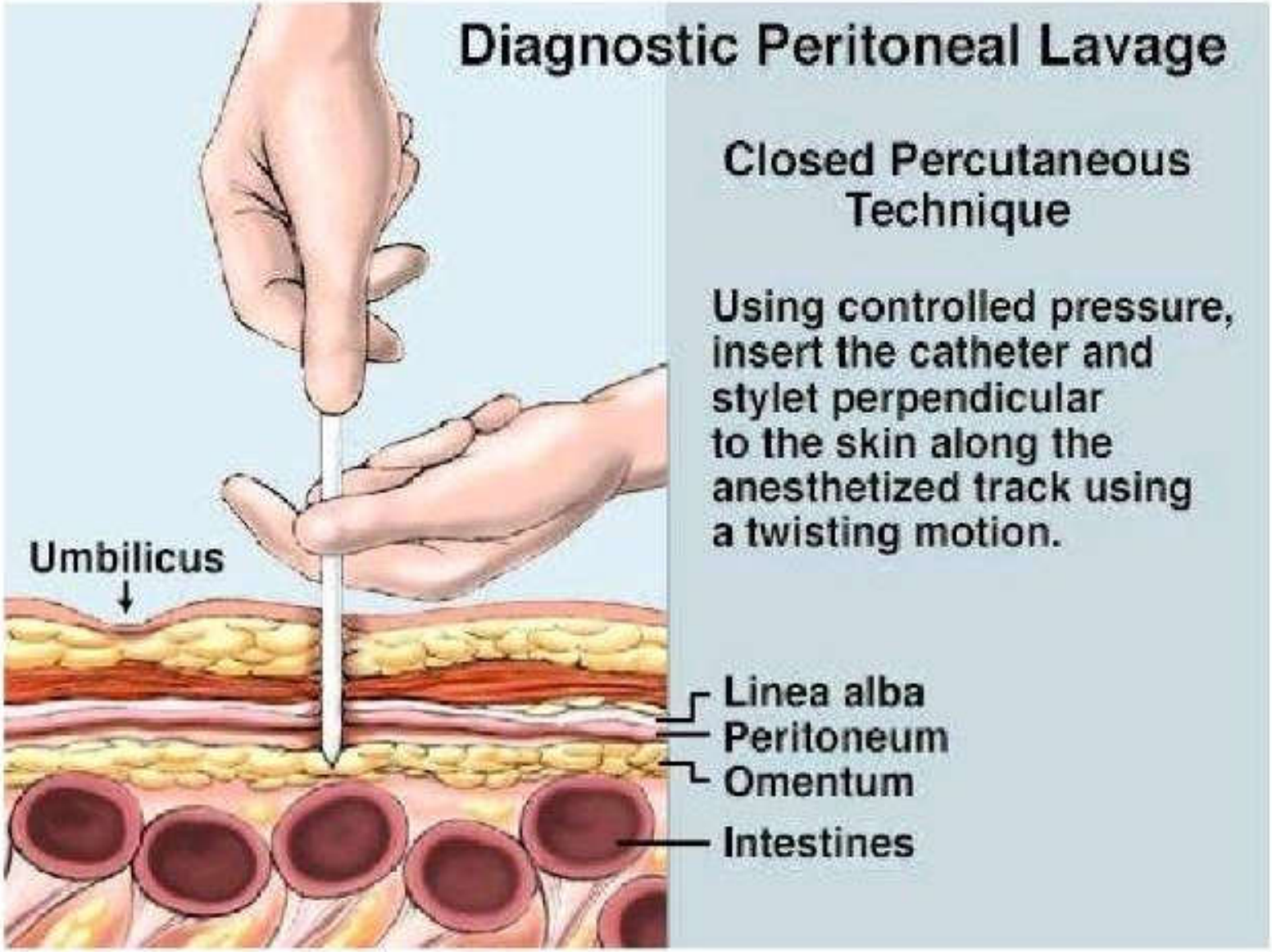
Contraindications of CT scan

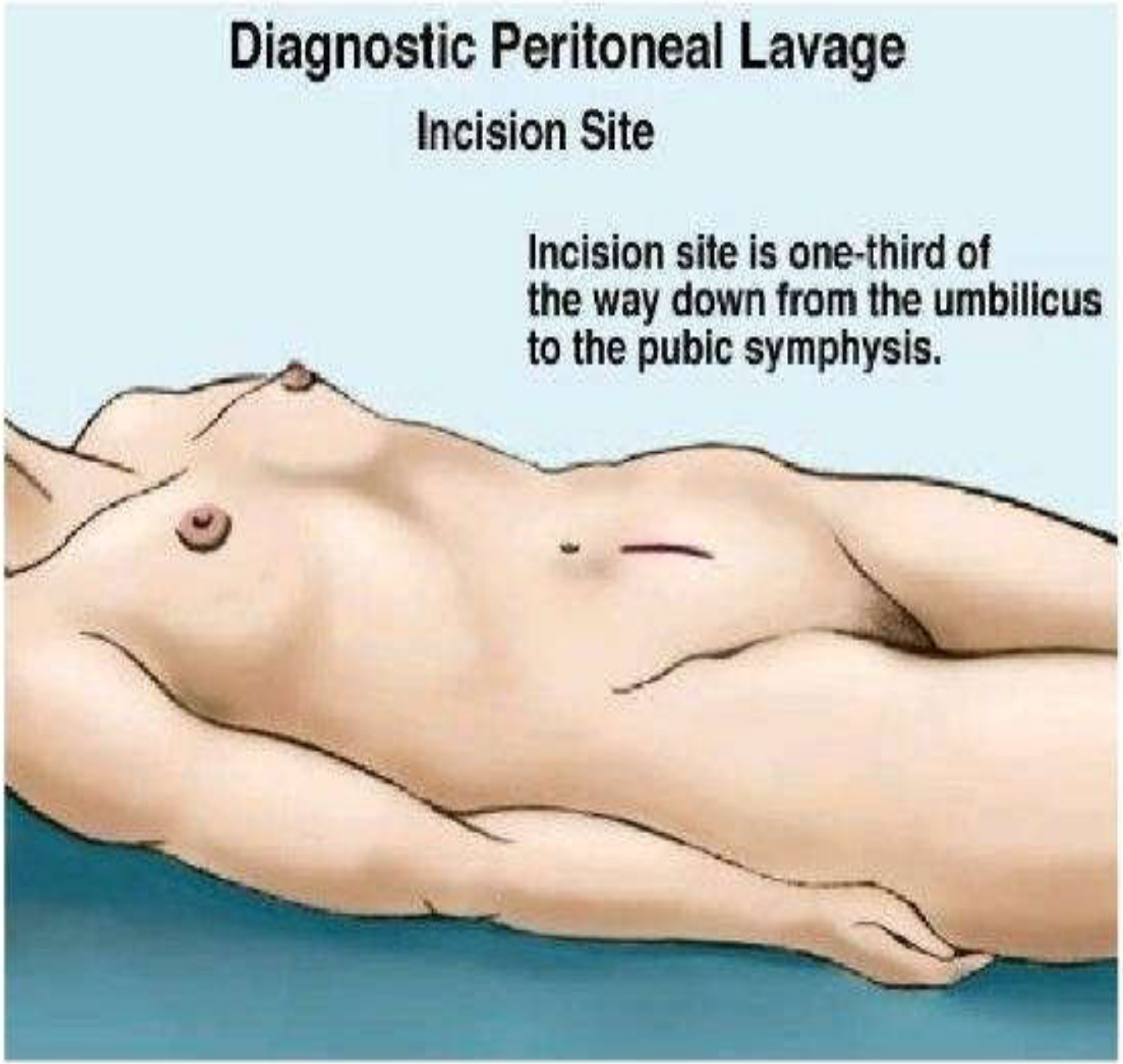
1. Clear indication for laparotomy
2. Haemodynamically unstable
3. Allergy to contrast media

Paracentasis

- four quadrant aspiration of abdomen
- a positive tap- blood, air, bile, stained fluid
- negative tap does not rule out injury
- false negative are as high as 22-60%

Diagnostic peritoneal lavage




Diagnostic Peritoneal Lavage
Incision Site
Incision site is one-third of
the way down from the umbilicus
to the pubic symphysis.

Indications

1. Unexplained shock
2. Altered sensor I'm (head injury, drug)
3. General anasthesia for extra-abdominal procedures

Contraindications

- Clear indication for exploratory laparotomy
- Relative:

1. Preview exploratory laparotomy
2. Pregnancy
3. Obesity

Esophageal trauma

قصي ابراهيم

Introduction

- Esophageal perforation may result from

1- **Noniatrogenic traumatic injuries** due to blunt or penetrating mechanisms ,are rare causes of esophageal perforation but can be life-threatening

The most common cause of noniatrogenic esophageal perforation is spontaneous rupture, followed by foreign body ingestion and malignancy

2-**iatrogenic** are more common than blunt injuries , can occur following esophageal instrumentation, but they may also result from percutaneous ablation procedures for cardiac arrhythmias.

Most cases are secondary to endoscopic examination and usually occur in the cervical part

Clinical feature and diagnosis

- The diagnosis of traumatic esophageal injury poses some unique challenges.
- time delays in diagnosis were a significant predictor of esophageal-related complications following penetrating esophageal injury
- The clinician must therefore maintain a high degree of suspicion based upon:

1- mechanism of injury (e.g., gunshot, stab),

2-site of injury (e.g., neck, chest, abdomen), and

3-the proximity of the esophagus to other identified injuries (often identified on computed tomography [CT]),

4- particularly given that clinical symptoms and signs of esophageal injury (e.g., dysphagia, neck pain, neck swelling, hypersalivation, retrosternal fullness, hematemesis, odynophagia, subcutaneous emphysema)

- The initial trauma evaluation of neck or chest injury is based upon the mechanism of injury, location, and clinical condition of the patient and often includes CT of the neck or chest, which may identify immediately life-threatening injury (e.g., aortic injury), or injury to structures (e.g., vascular, laryngotracheal, spinal injury) in proximity to the esophagus; however, the overall sensitivity of CT for esophageal injury is low
- **Associated injuries** — Penetrating trauma at the esophageal hiatus is often associated with injuries to the liver, spleen, aorta, vena cava, pancreas, stomach, colon, lung, heart, and spine, which can be identified by CT scan

- **Esophagoscopy and esophagography** —
  esophagoscopy and esophagography are used to directly visualize esophageal injury and perforation.
- For patients who are clinically stable, we suggest flexible esophagoscopy to establish a diagnosis of esophageal perforation. If endoscopy is not possible, or the results are equivocal, then esophagography can be performed.
- Esophagography should initially be performed with water-soluble contrast [Gastrografin]) to avoid the negative effects of barium spillage into the mediastinum.

Management

- Initial management includes securing the airway, appropriate fluid resuscitation, laboratory evaluation, and type and crossmatch.
- A nasogastric tube should be placed under direct vision to provide gastrointestinal decompression, if possible.
- Broad-spectrum intravenous antibiotics should be administered covering aerobes and anaerobes. If the patient has been on a longstanding therapy with a proton pump inhibitor, antifungal therapy should also be administered, particularly for lower esophageal injuries.

The decision between operative and non-operative management rests on four factors. These are:

1- the site of the perforation (cervical versus thoracoabdominal esophagus);

2 -the event causing the perforation (spontaneous versus instrumental);

3 -underlying pathology (benign or malignant);

4 -the status of the esophagus before the perforation (fasted and empty versus obstructed with a stagnant residue).

It follows that most perforations that can be managed nonoperatively occur in the context of small instrumental perforations of a clean esophagus without obstruction, where leakage is likely to be confined to the nearby mediastinum at worst

Instrumental perforations in the cervical esophagus are usually small and can nearly always be managed conservatively.

The conservative management of an instrumental perforation in the thoracoabdominal parts of the esophagus can be undertaken when the perforation is detected early and prior to oral alimentation

- General guidelines for non-operative management include:

• pain that is readily controlled with opiates;

• absence of crepitus, diffuse mediastinal gas, hydropneumothorax or pneumoperitoneum;

• mediastinal containment of the perforation with no evidence of widespread extravasation of contrast material;

• no evidence of ongoing luminal obstruction or a retained foreign body

Surgical management is required whenever patients:

• are unstable with sepsis or shock;

• have evidence of a heavily contaminated mediastinum, pleural space or peritoneum;

• have widespread intrapleural or intraperitoneal extravasation of contrast material.

- Surgical procedure:

1-primary repair

2-Drainage alone

3-Resection and diversion

4-Resection and anastomosis

5-Drainage as an adjunct procedure

- For patients requiring surgery, the choice rests between direct repair, the deliberate creation of an external fistula or, rarely, esophageal resection with a view to delayed reconstruction. Direct repair is preferred by many surgeons if the perforation is recognized early (within the first 4–6 hours) and the extent of mediastinal and pleural contamination is small. After 12 hours, the tissues become swollen and friable and less suitable for direct suture..

- Primary repair is inadvisable with late presentation and in the presence of widespread mediastinal and pleural contamination. These patients tend to be more ill as a result of the delay, and the aim of treatment should be to achieve wide drainage with the creation of a controlled fistula and distal enteral feeding. This can usually be achieved by placing a T-tube into the oesophagus along with appropriately located drains and a feeding jejunostomy. In unusual circumstances, for instance with extensive necrosis following corrosive ingestion, emergency esophagectomy may be necessary. Esophagectomy and gastrostomy should be performed with a view to delayed reconstruction.
- Ongoing luminal obstruction (often related to malignancy) in a frail patient considered unfit for major surgery can be dealt with by placement of a covered self-expanding stent

Boerhaave syndrome

- refers to an esophageal rupture secondary to forceful vomiting and retching.

- **Epidemiology**
- It tends to be more prevalent in males, with alcoholism a risk factor.

Clinical presentation

- They are often associated with the clinical triad of vomiting, chest pain and subcutaneous emphysema . (Other symptoms include epigastric pain, back pain, dyspnea and shock. This condition was universally fatal before the age of surgery.

What is the intervention should be done ?

- The diagnosis of Boerhaave's syndrome is suggested on the plain chest radiography and confirmed by chest CT scan.
- 1- **X- Ray**
- The classic X- Ray findings include pneumomediastinum , left plural effusion and left pneumothorax . Gas may also be seen with the soft tissue spaces of the chest wall and the neck.

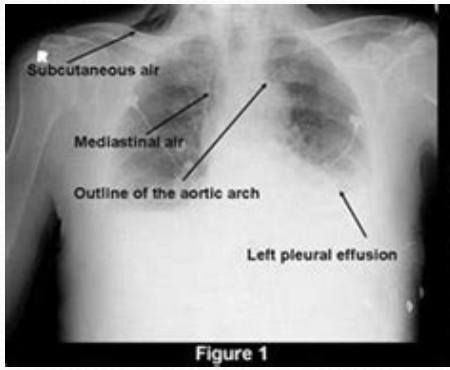


Figure 1

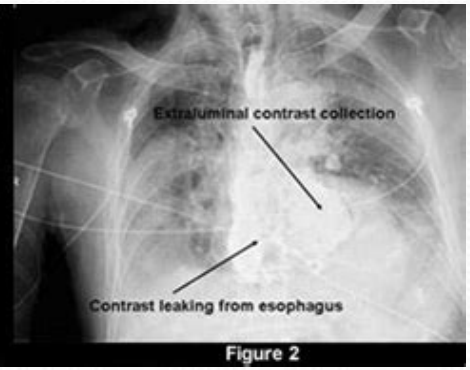


Figure 2

- 2- **CT scans :**
- Features reported on unenhanced CT scans include the presence intramural hematoma with a typical localization and peri-esophageal air collections indicating esophageal perforation .
- Post contrast CT imaging may show direct contrast leakage/tracks and esophageal wall thickening
- Other reported findings include:
- **1-** the presence of peri-aortic air tracks
- 2- pneumothorax: has a left sided predilection
- 3-pneumomediastinum
- 4- pleural effusion: usually left sided.
- 5- mediastinal fluid collections

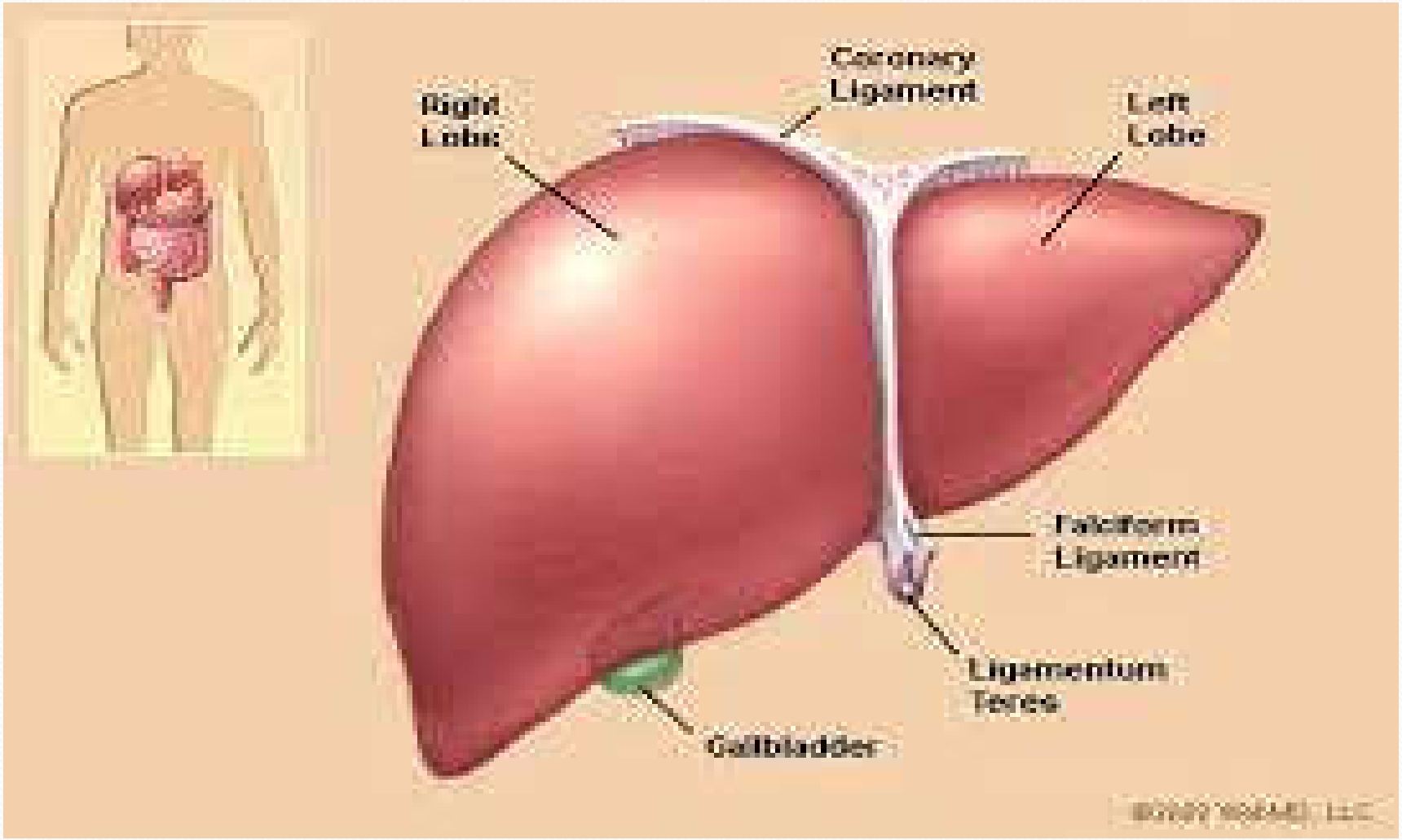
TREATMENT AND PROGNOSIS

- Mediastinal infection and sepsis can be life-threatening (mortality as high as 35% [1]), especially if there is a delay in diagnosis. >> broad-spectrum antibiotics (Ampicillin/ Amoxicillin…etc)

- Surgery is the gold standard treatment.

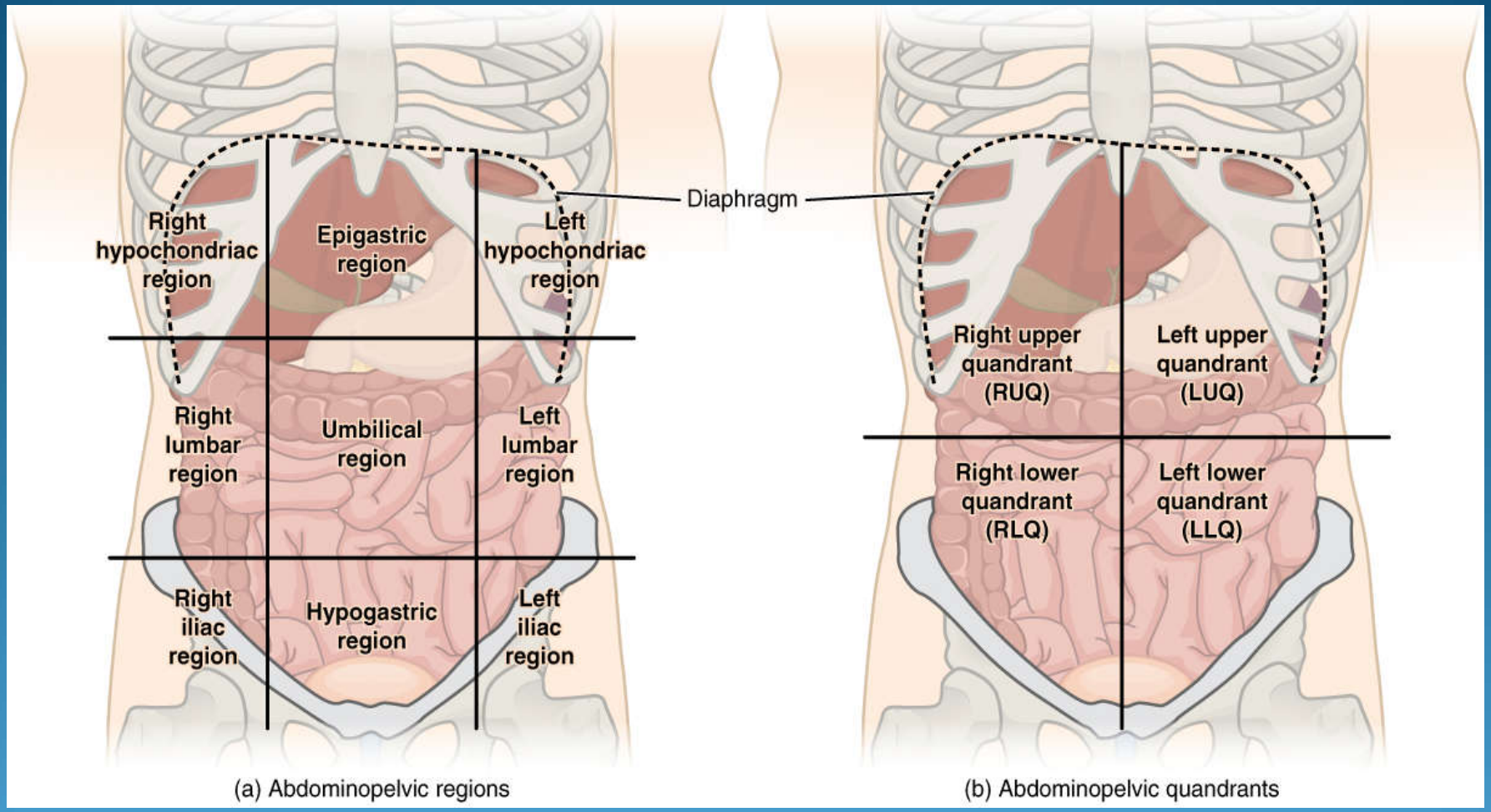
- Mortality has been to be as low as 6.2% when identified and treated in the first 24 hours

Liver trauma

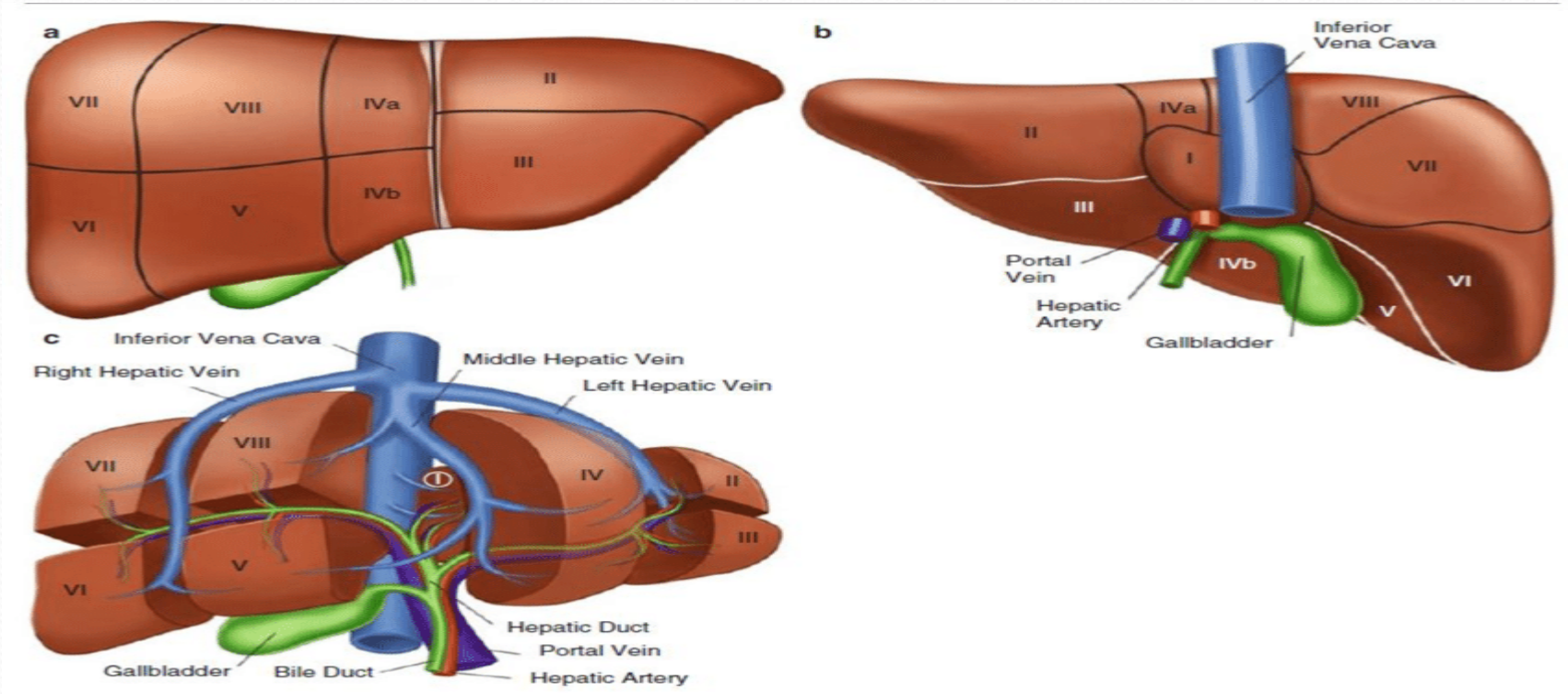


Introduction

- The liver is one of the largest organ in the body, weighing 1.7 kg in the average 80-kg man.
- The liver is the second most common organ injured in abdominal trauma after the spleen.
- The liver's large size makes it the organ most susceptible to blunt trauma, and it is frequently involved in upper torso penetrating wounds.


Diaphragm
Right hypochondriac region
Epigastric region
Left hypochondriac region
Right lumbar region
Umbilical region
Left lumbar region
Right iliac region
Hypogastric region
Left iliac region
(a) Abdominopelvic regions
Right upper quandrant (RUQ)
Left upper quandrant (LUQ)
Right lower quandrant (RLQ)
Left lower quandrant (LLQ)
(b) Abdominopelvic quandrants

- The liver has four lobes
- 8 segments

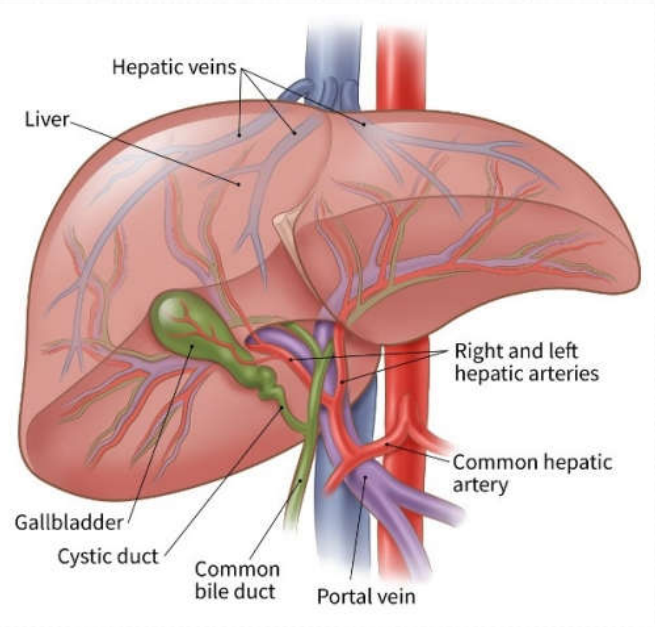


The liver receives the oxygen and nutrients it needs in blood that comes from two large blood vessels:

Portal vein.

Hepatic artery.

The hepatic veins drain the liver into the inferior vena cava.



- Because of its size and location the liver is frequently injure injured in both blunt and penetrating trauma
- The overall mortality rate ranges from 8% to 10% and the overall morbidity rate varies from 18 – 30 %
- Right Lobe >>> Left Lobe

Etiology

1- Blunt trauma

- the majority of liver injuries are due to blunt trauma , caused by direct blow , crushing or fall from height
- The liver is solid organ and compressive forces can easily burst the liver substances being compressed between the force and rib cage and vertebral column

Etiology

2)Penetrating injury

Stab wounds and gunshot wounds are often associated with chest or pericardial involvement.

3) Iatrogenic injury

Abdominal surgery, needle biopsy ,laparoscopy.

Sign and symptoms

- RUQ pain radiate to shoulder
- Rib fracture
- Guarding
- Peritonism
- Hypotension
- Altered mental status

Associations:

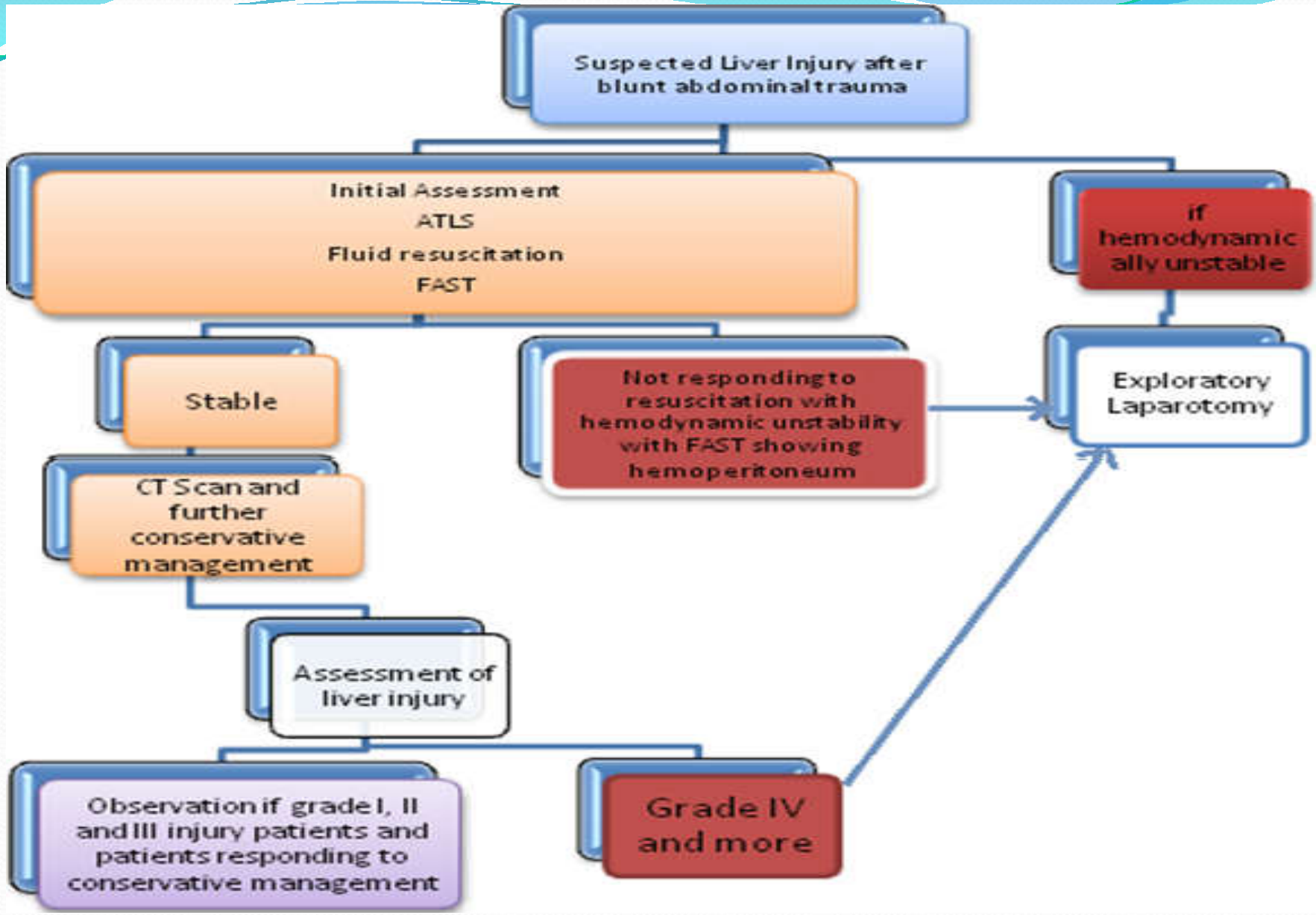
- Isolated liver injury occurs in less than 50% of patients.
- Blunt trauma→ 45% with spleen
- Rib fracture → 33% with Liver injury

Mild injuries heal in 3 months.
Moderate injuries heal in 6 months.
Sever injuries in 9-15 months

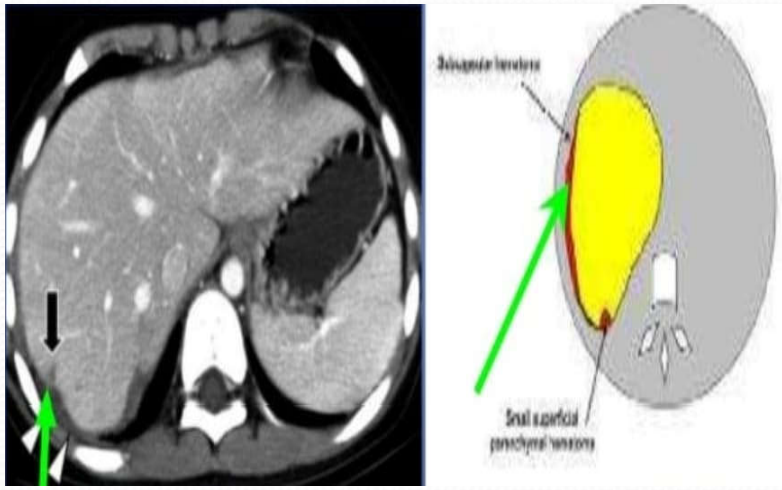
Diagnosis

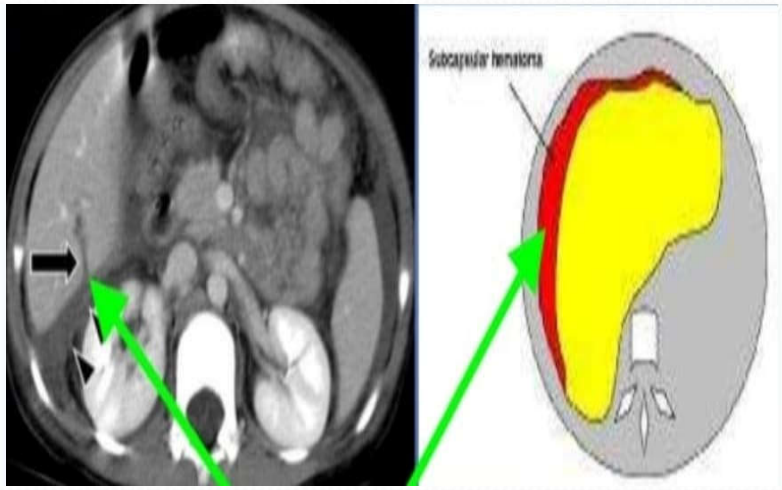
- Clinical suspicion of a possible liver injury is essential, as a laparotomy by an inexperienced surgeon with inadequate preoperative preparation is doomed to failure.
- severe crushing injuries to the lower chest or upper abdomen and All lower chest and upper abdominal stab wounds should be suspect liver injury
- Patients with free intraperitoneal fluid on FAST and hemodynamic instability, and patients with a penetrating wound, will require a laparotomy

- Patients who are hemodynamically stable should have a contrast enhanced CT scan of the chest and abdomen as the next step.
- This scan will demonstrate evidence of parenchymal damage to the liver or spleen, as well as associated traumatic injuries to their feeding vessels. Free fluid can also be clearly established. The chest scan will help to exclude injuries to the great vessels and demonstrate damage to the lung parenchyma.


Suspected Liver Injury after blunt abdominal trauma
Initial Assessment
ATLS
Fluid resuscitation
FAST
if hemodynamically unstable
Stable
Not responding to resuscitation with hemodynamic unstability with FAST showing hemoperitoneum
Exploratory Laparotomy
CT Scan and further conservative management
Assessment of liver injury
Observation if grade I, II and III injury patients and patients responding to conservative management
Grade IV and more

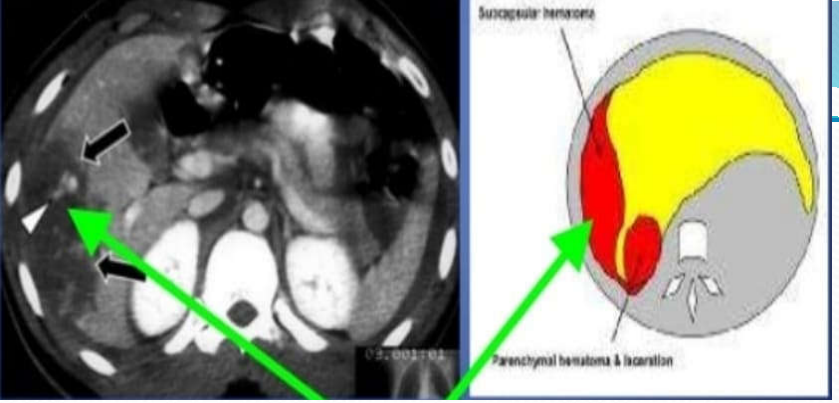
Grading of liver injury AAST



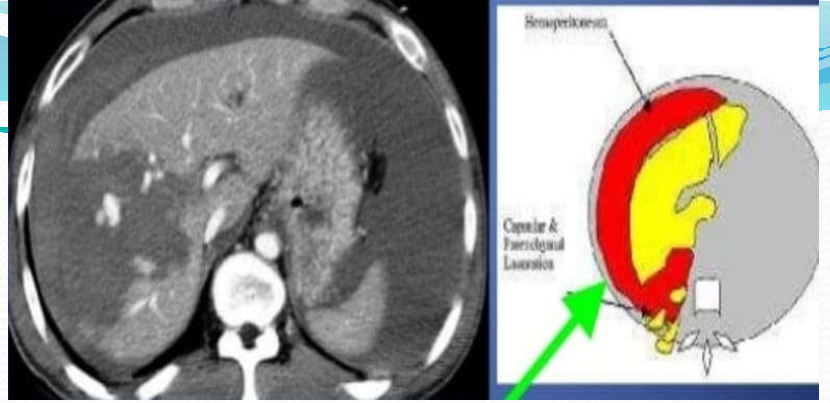


Grade 1 – Subcapsular hematoma <10% surface area
– Parenchymal laceration <1 cm in depth

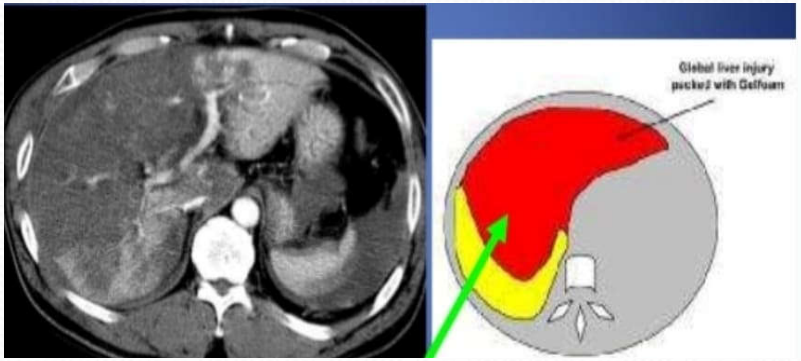
Grade2
– Subcapsular hematoma 10–50% surface area; intraparenchymal hematoma <10 cm in diameter
– Laceration 1–3 cm in depth and ≤ 10 cm length



Grade 3
– Subcapsular hematoma >50% surface area; ruptured subcapsular or parenchymal hematoma
– Intraparenchymal hematoma >10 cm
– Laceration >3 cm depth

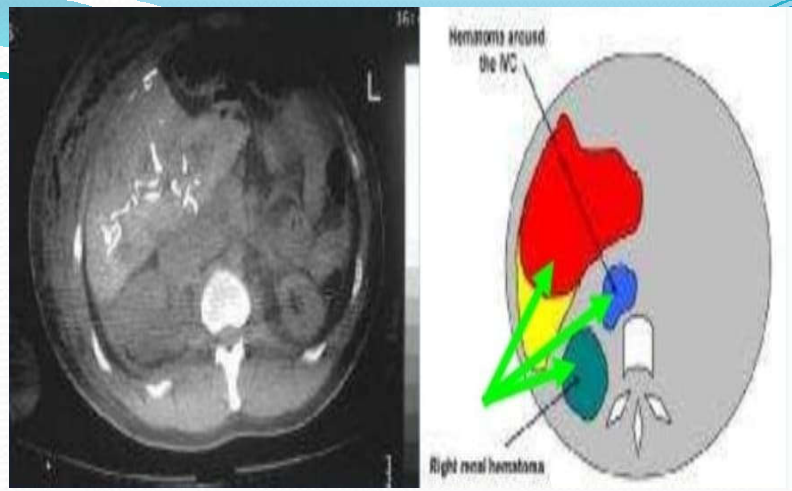


Grade 4
– Parenchymal disruption involving 25–75% of a hepatic lobe
– Active bleeding extending beyond the liver parenchyma into the peritoneum



Grade 5
– Parenchymal disruption >75% of hepatic lobe
– Juxtahepatic venous injury to include retrohepatic vena cava and central major hepatic veins

Grade 6
Hepatic Avulsion



Grade	Injury type	Injury description
I	Haematoma	Subcapsular < 10 % surface
	Laceration	Capsular tear < 1 cm parenchymal depth
II	Haematoma	Subcapsular 10–50 % surface area; intraparenchymal, < 10 cm diameter
	Laceration	1–3 cm parenchymal depth, < 10 cm in length
III	Haematoma	Subcapsular > 50 % surface area or expanding, ruptured subcapsular or parenchymal haematoma. Intraparenchymal haematoma > 10 cm
	Laceration	> 3 cm parenchymal depth
IV	Laceration	Parenchymal disruption 25–75 % of hepatic lobe
V	Laceration	Parenchymal disruption involving > 75 % of hepatic lobe
	Vascular	Juxtavenous hepatic injuries i.e., retrohepatic vena cav/central major hepatic veins
VI	Vascular	Hepatic avulsion

Advance one grade for multiple injuries up to grade III
AAST liver injury scale (1994 revision)

- How does grading help ?
- Grade I and II generally can be managed non-operatively
- Grade III - IV generally require surgery
- Grade VI is incompatible with survival

Note

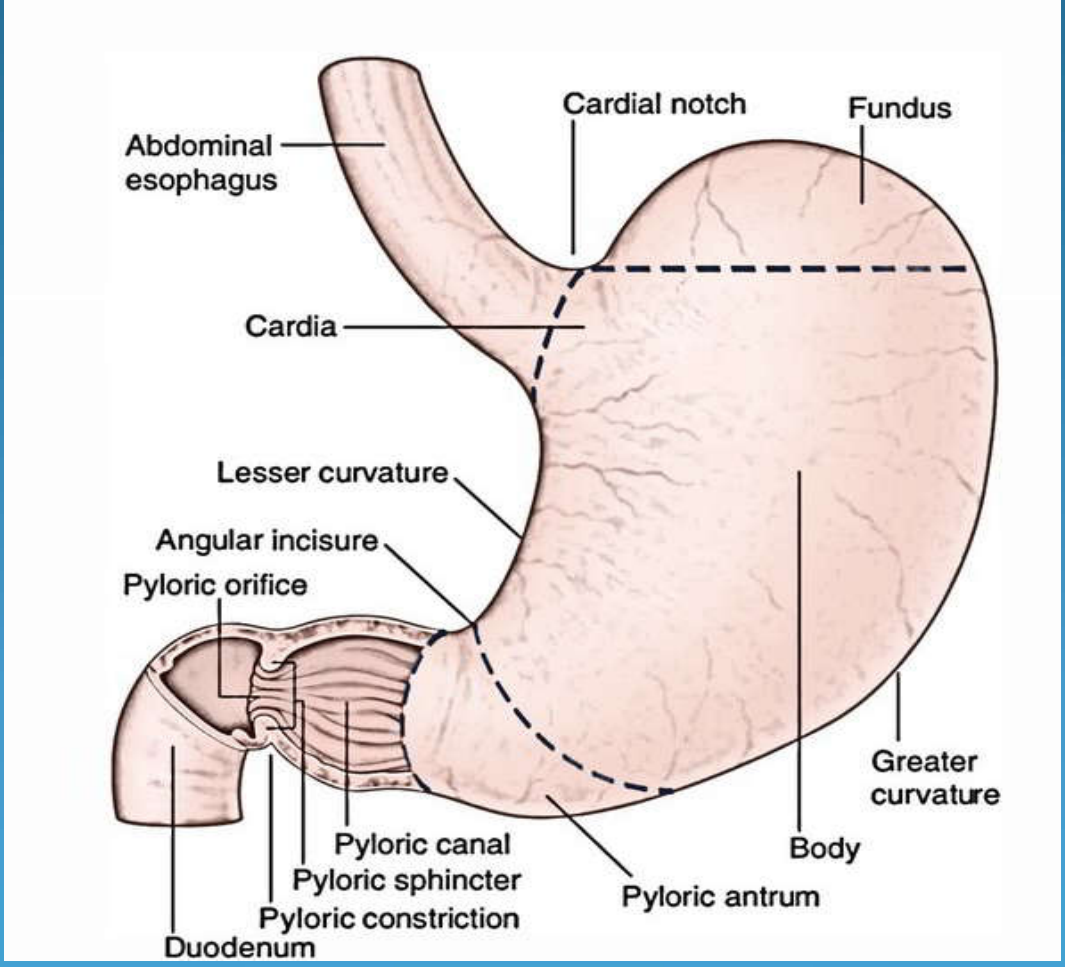
Neither grade of injury and/or degree of haemoperitoneum on CT predict the outcome

Haemodynamic status of the patient is the most reliable predictor

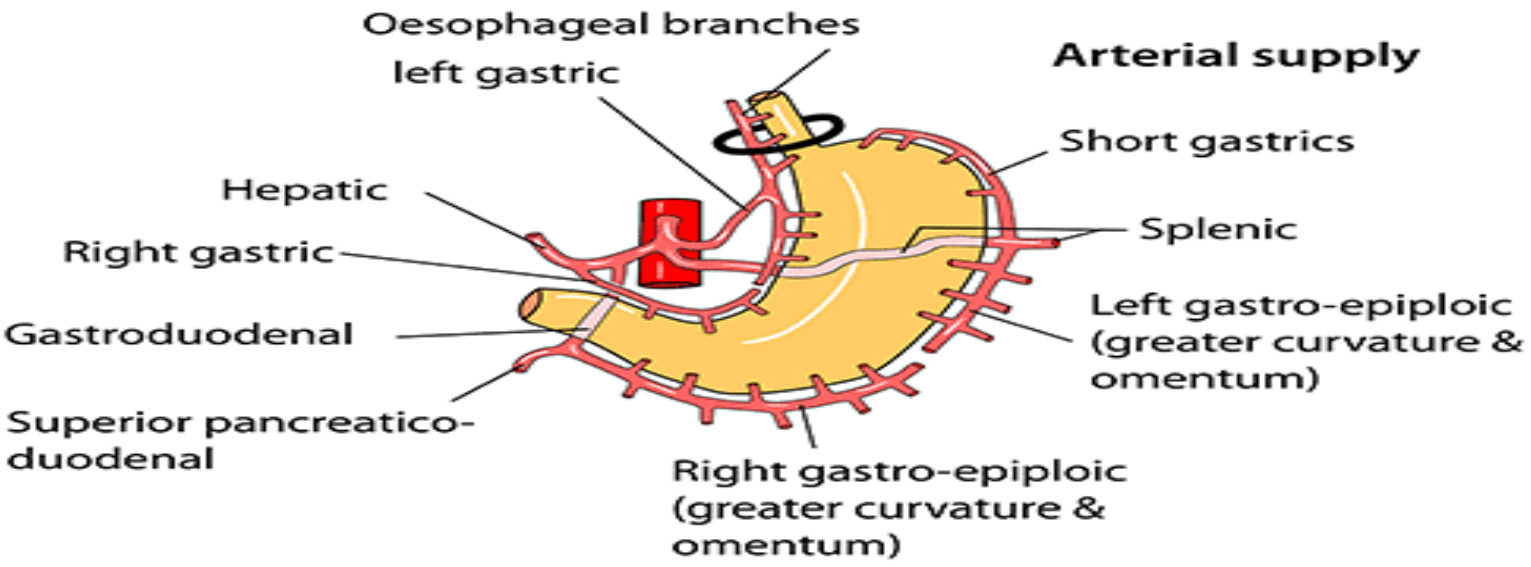
Criteria for Operative Management	Criteria for non Operative Management:
1) any patient who is haemodynamically unstable with suspected liver trauma	(1) haemodynamic stability, or stability achieved with minimal resuscitation(1-2 litres of crystalloid)
(2) multiple transfusions required to maintain haemodynamic stability	(2) absence of other abdominal injuries requiring laparotomy
(3) signs of peritonism, or development of peritonism on serial abdominal examinations	(3) preserved consciousness allowing serial examination of abdomen
(4) active arterial blush on CT for which interventional techniques have failed and/or ongoing bleeding on CT scan with focal pooling of contrast	(4) absence of peritonism
(5) penetrating trauma	(5) absence of ongoing bleeding on CT scan

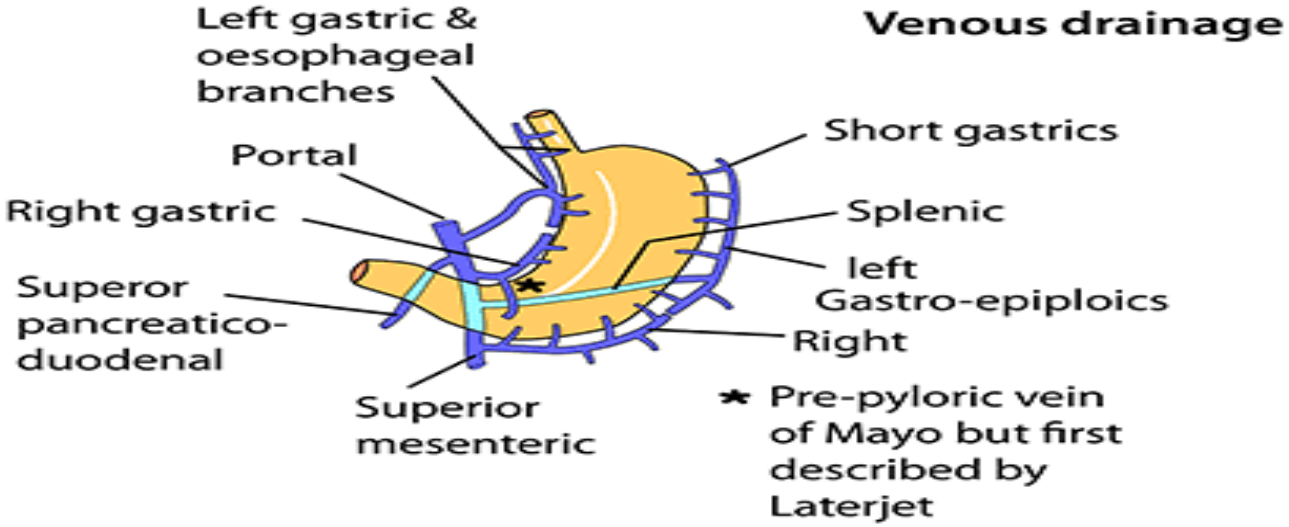
Traumatic injury of stomach

يوسف عابدين



STOMACH - BLOOD SUPPLY & VENOUS DRAINAGE



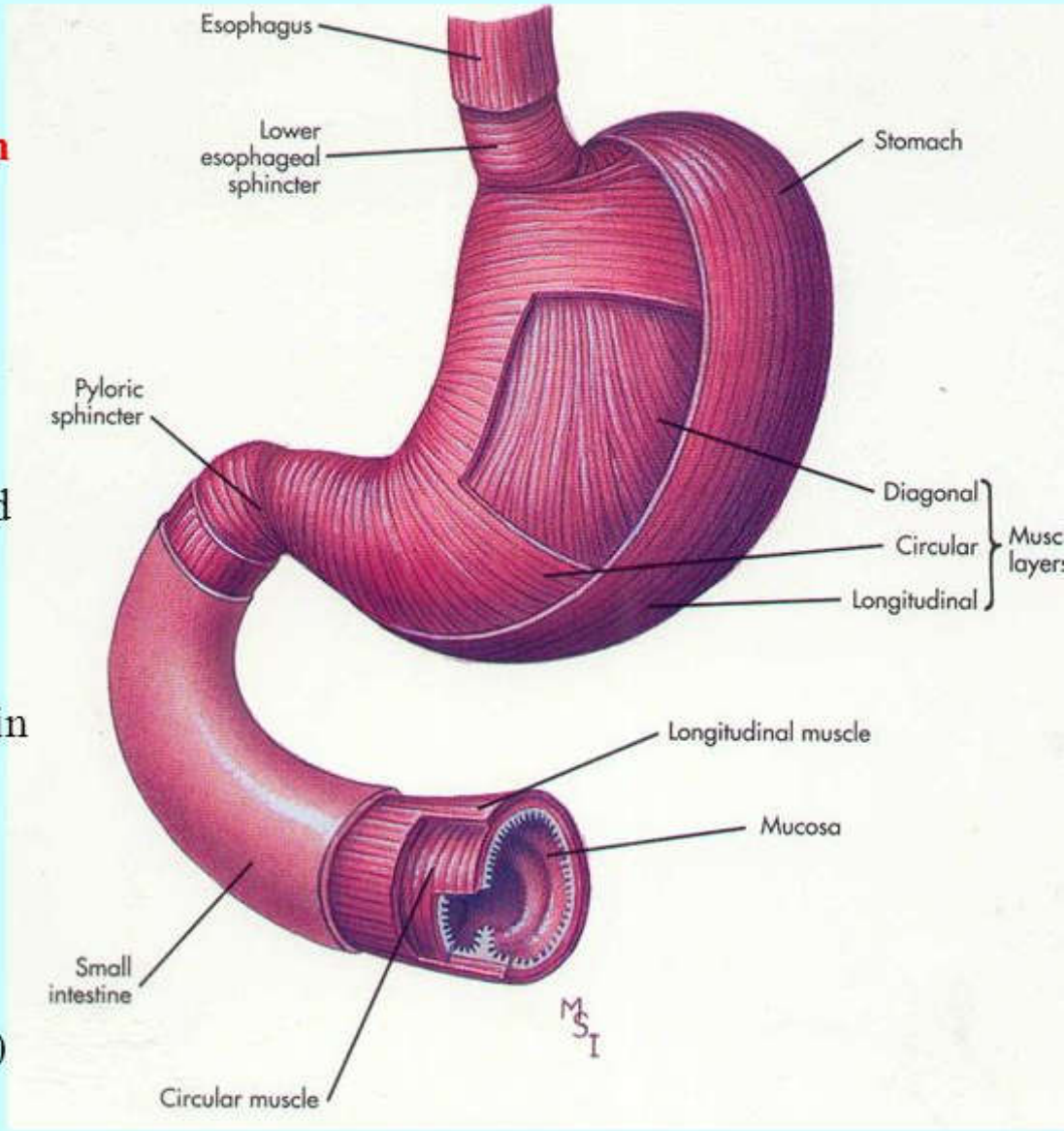


Stomach

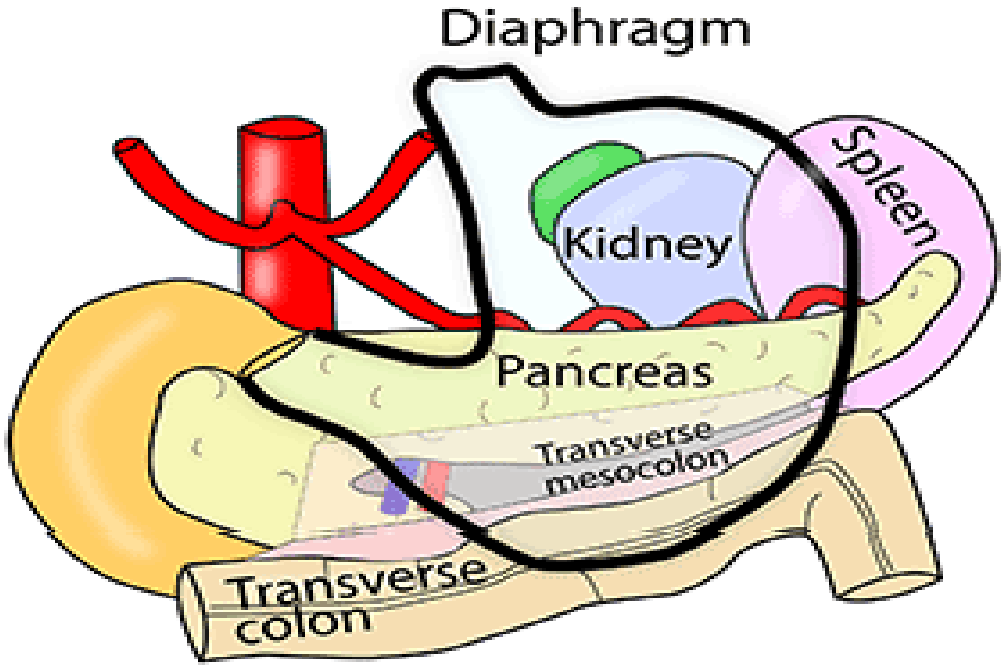
connects the **esophagus** to the **duodenum** (first part of the small intestine)

Functions:

1. serves as a mixing area for saliva, food and gastric juice
2. serves as a reservoir for holding food before release into the SI
3. secretes gastric juice (**HCL**, **pepsin**, **intrinsic factor**, **gastric lipase**)
   HCL kills bacteria, denatures protein
   pepsin begins digestion of proteins
   intrinsic factor aids absorption of vitamin B12
   gastric lipase aids digestion of triglycerides
4. secretes **gastrin** (digestive hormone) into the blood



STOMACH - RELATIONS



ANTERIOR
Abdominal wall
Left costal margin
Diaphragm
Left lobe of liver

SUPERIOR
Left dome of diaphragm

POSTERIOR
Lesser sac
Pancreas
Transverse mesocolon
Transverse colon
Left kidney/suprarenal gland
Spleen/splenic artery

Stomach injuries

- Gastric injuries following blunt abdominal trauma are rare, accounting for < 2% of all blunt abdominal injuries.
- Isolated blunt gastric ruptures are uncommon.
- They are usually associated with other solid visceral injuries. Injuries to the stomach are associated with the highest mortality of all hollow viscus injuries.
- Severity of the injury, timing of presentation and presentation following the last meal as well as concomitant injuries are important prognostic factors. Imaging modalities may be unreliable in making a diagnosis in emergency situation

Case report

A 29 years old male patient presented with severe abdominal pain and distention as a result of blunt abdominal trauma sustained in a motor vehicle accident 2 h previously. At presentation, the patient was fully conscious, normotensive with a pulse rate of 112/min. The hemoglobin was 13.6 g/dL. Multiple bruises and abrasions were evident over the anterior chest and epigastrium. The abdomen was distended and peritonitic. The patient was also tender over the left lower anterior chest wall; air entry was normal

Summary of the features of gastric injury due to blunt trauma

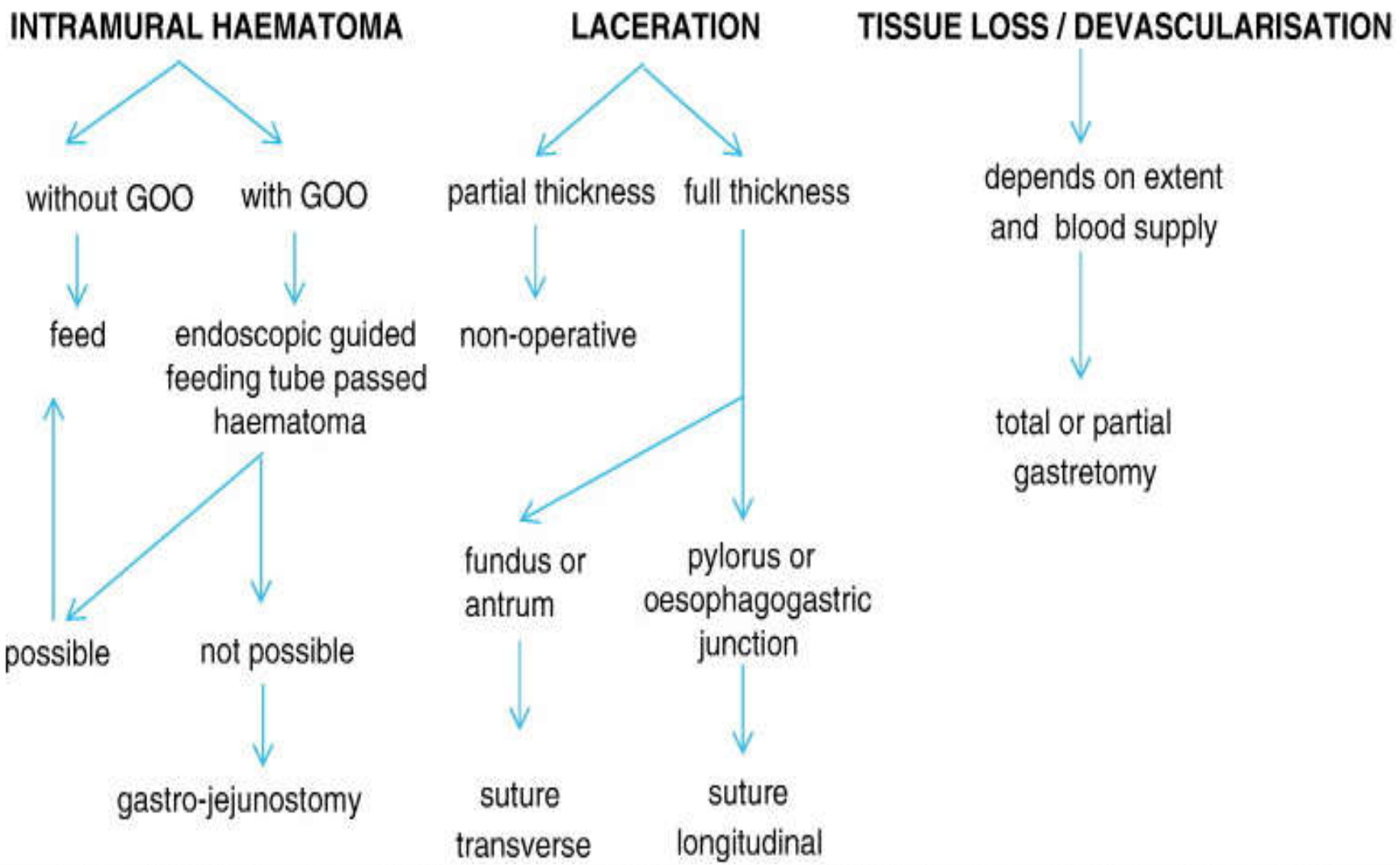
Mechanisms of injury	Increase in intra gastric pressure
	Deceleration shear force tears
	Crush between anterior abdominal wall and vertebra
Location of injury	Anterior wall (40%)
	Greater curve (23%)
	Lesser curve (15%)
	Posterior wall (15%)
Most common associated injury	Spleen
Mortality	Increases with time to operative intervention
Complications	Abdominal abscess (24%) [more common in post-prandial trauma]
Diagnosis	Abdominal radiograph: pneumoperitoneum
	Peritoneal paracentesis: dark coloured fluid
	Ct : free fluid with thickened wall and mesenteric fat standing
Management	According to grade

Grading of gastric injuries

Grade I	Intramural hematoma < 3 cm	
	Partial thickness laceration	
Grade II	Laceration:	< 2 cm in GE junction/pylorus
		< 5 cm in proximal one-third
		< 10 cm in distal two-third
Grade III	Laceration:	> 2 cm in GE junction/pylorus
		≥ 5 cm in proximal one-third
		≥ 10 cm in distal two-third
Grade IV	Vascular:	Tissue loss/devascularisation ≤ two-third stomach
Grade V	Vascular:	Tissue loss/devascularisation ≥ two-third stomach

The management approach is prompted by the nature of the injury (intramural haematoma, extent of the laceration and presence of gastric tissue loss and devascularisation)

GOO, gastric outlet obstruction



Traumatic Injury of intestine

Small intestine

duodenum about 25–38

jejunum about 0.9 meter

ileum about 1.8 meters

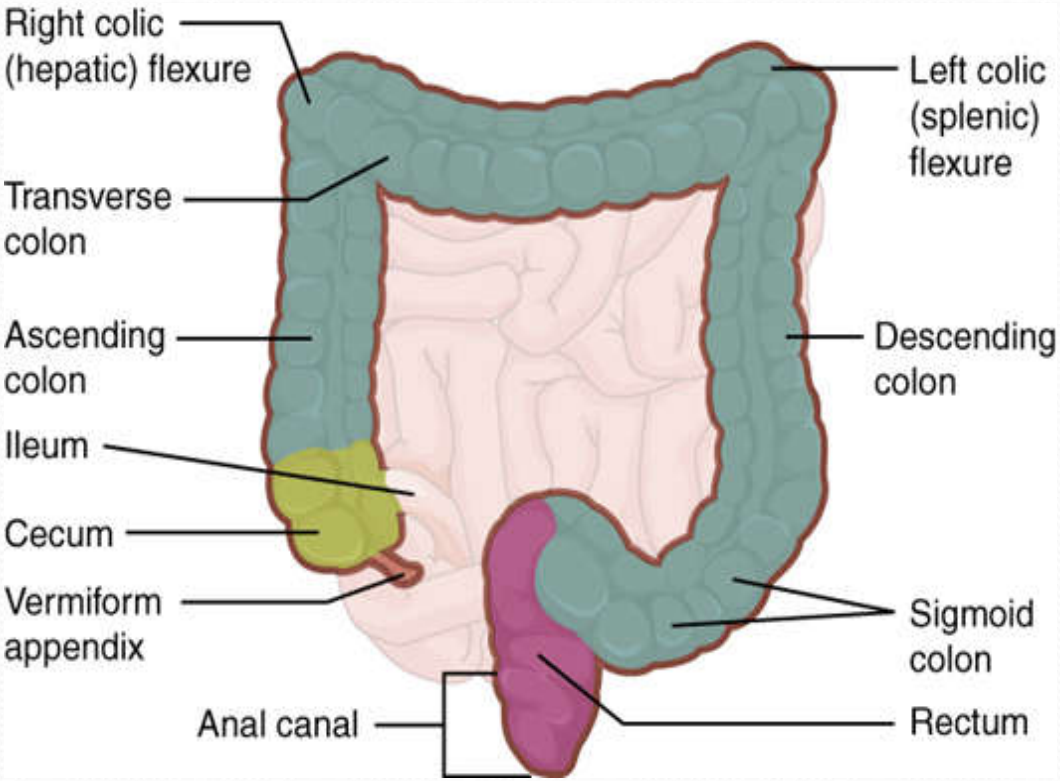
Blood supply :

The duodenum receives blood from the celiac trunk via the superior pancreaticoduodenal artery and from the superior mesenteric artery via the inferior pancreaticoduodenal artery

Superior mesenteric artery supplies small intestine

Large intestine : the cecum colon, rectum, and anus.

Blood supply : The inferior mesenteric artery



Locations of the intestines in relation to the peritoneum:

- **Intraperitoneal** :
  - First part of duodenum
  - jejunum
  - ileum
  - transverse & sigmoid colon

- **Retroperitoneal** :
  - Ascending &descending colon
  - Rectum

Small intestine injury

- Small bowel injury is associated with injury mechanisms that include front seat passenger position in motor vehicle crashes, falls, and pedestrians struck by automobiles.

- Small bowel injuries associated with blunt trauma were contusions limited to the bowel serosa in contrast to penetrating injuries that typically result in perforation.

- However, almost one-third of mesenteric injuries resulted in a devascularized bowel segment that ultimately required resection.

Small intestine injury (cont.)

- If a perforation was identified, it was most likely to be in the jejunum.
- Blunt small intestinal injury can be difficult to detect because a full-thickness bowel injury may not be immediately present in contrast to the immediate intestinal leakage that is typical of penetrating intestinal injury. Following blunt intestinal injury, full-thickness necrosis and intestinal rupture may develop over days.

Colon and rectum injury

- Colonic and rectal injuries are relatively uncommon. Blunt injury to the mesentery occurs commonly at transition points where the mobile portions of the colon become fixed retroperitoneally, such as in the region of the ileocecal valve and sigmoid colon.
- The rectum can be injured in association with pelvic fractures.
- Colonic injury can be particularly difficult to diagnose due to the retroperitoneal location of much of the colon.

Ruptured bowel

The leakage of bowel contents into the abdominal cavity.

Contents are either:

- Bacteria,
- Bile,
- stomach acid,
- partially digested food, or
- stool

Life thereating condition:

- Peritonitis : inflammation of the peritoneum, the thin layer of tissue that lines the abdomen. Without treatment,
- Peritonitis can cause blood poisoning, or sepsis.
- Sepsis may lead to organ failure and death .

How to diagnose ruptured bowel?

- look for signs of infection, such as

  a high WBC count

- evaluate **hemoglobin level**, which can indicate if there is a source of bleeding

- evaluate **electrolytes**

- evaluate **acid level in the blood**

1. **Upright Chest X-ray**

   free air under diaphragm?

2. **CT Scan**

   hypodense fluid in the peritoneal cavity?

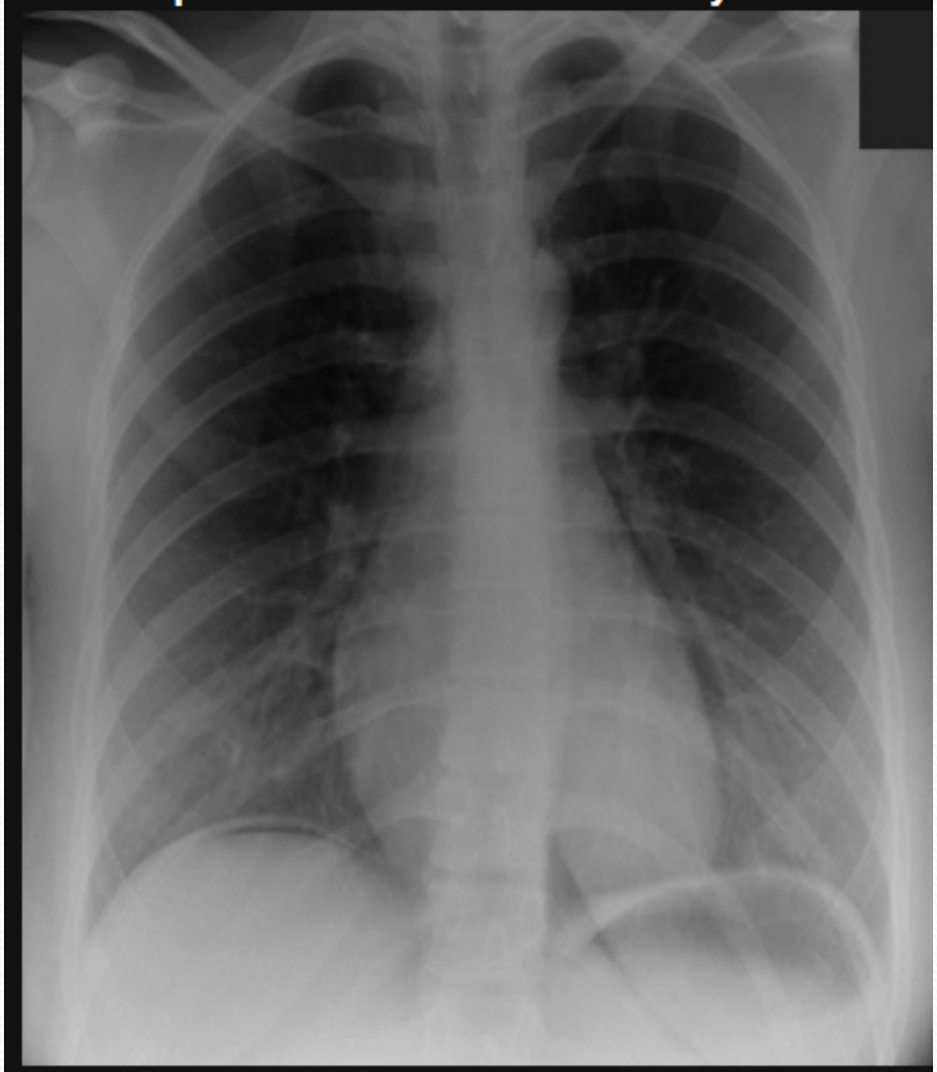
   dense fluid may suggest haemoperitoneum

Diagnostic Laparoscopy or Laparotomy

Perforation - Erect Chest X-ray

- If perforation is suspected then an erect chest X-ray should be performed as well as an abdominal X-ray.
- This image shows a very large volume of gas under the diaphragm due to bowel perforation.

Pneumoperitoneum - Erect chest X-ray



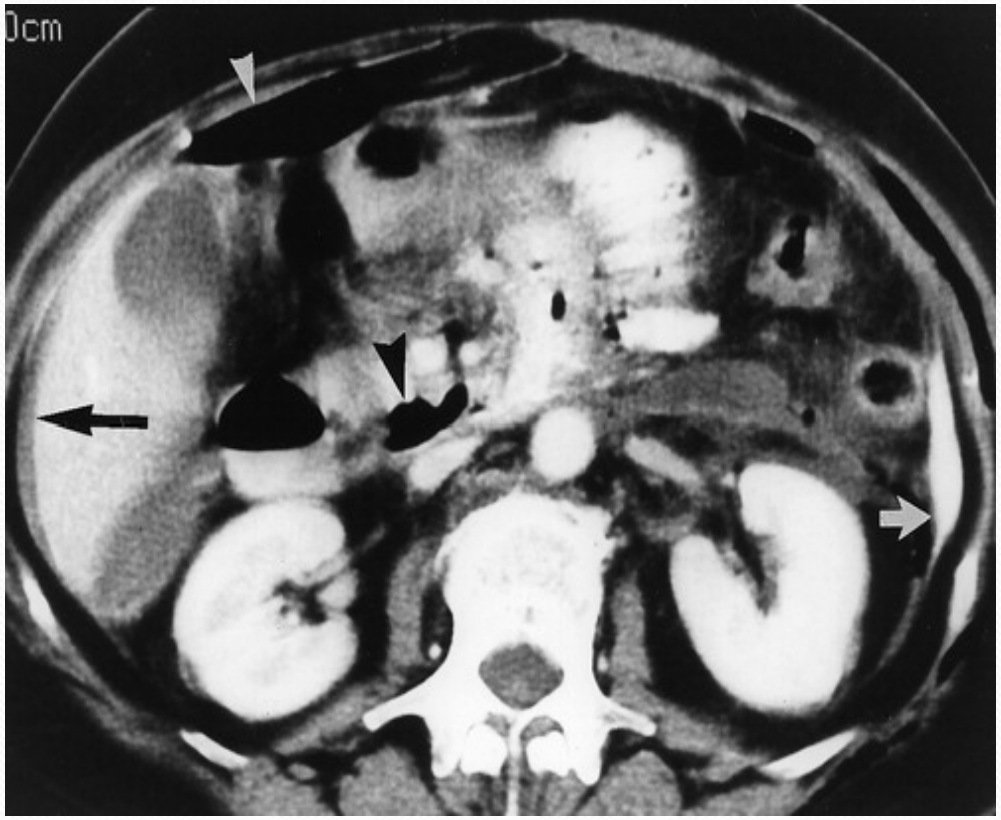
Hover on/off image to show/hide findings

Pneumoperitoneum - Erect chest X-ray

- An erect chest X-ray can show even a very small volume of free abdominal gas.
- Reference to the clinical setting is required to determine if this is a potentially life-threatening perforation.
- This patient had undergone laparoscopic surgery earlier in the day. The free gas under the diaphragm is insufflated carbon dioxide, an acceptable post-surgical finding.
- A careful check should be made for free gas under the diaphragm on every chest X-ray.

Duodenal and jejunal perforations in a 65-year-old woman.

a



b

- **(a)** Abdominal CT scan reveals free fluid (black arrow), free intraperitoneal air (white arrowhead), retroperitoneal air (black arrowhead), and intraperitoneal contrast material (white arrow).
- **(b)** On a CT scan obtained at a lower level, a large quantity of free contrast material outlines a pelvic small-bowel loop (white arrows).

Management

1. **Surgery :** fix the anatomical problem

   wait-and-see approach : rarely used

2. **Antibiotics and IV fluids**

3. **Colostomy or ileostomy**

- Fix the anatomical problem : **surgery**

  wait-and-see approach : rarely used

- For peritonitis : **IV antibiotic**

- Remove any foreign material in the abdominal cavity such as feces, bile, and food

- The devascularized bowel segment will need removal i.e. resection
- The removal of a portion of either the small intestine or colon may result in a colostomy or ileostomy.

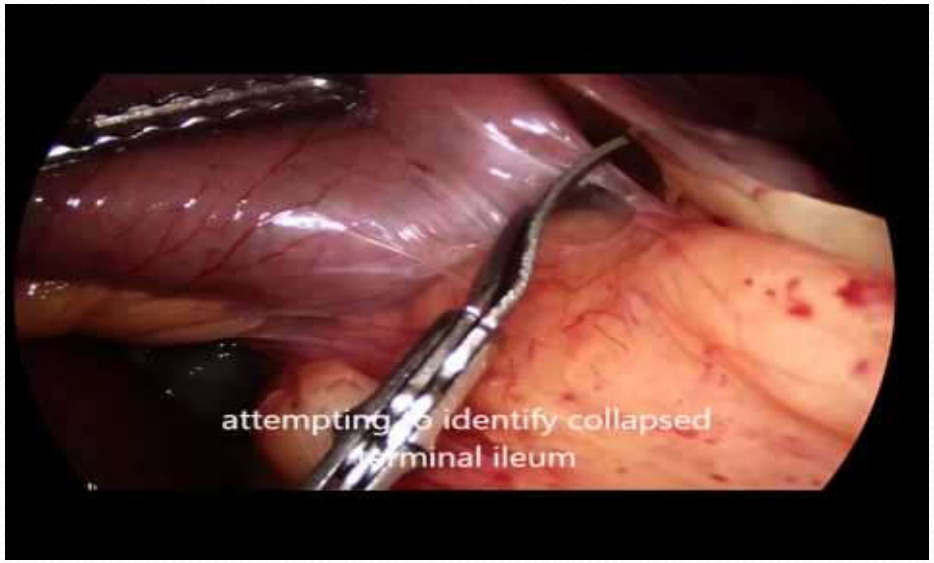
Complication

- Bleeding complications
- Small bowel obstruction can also occur after repairing a small bowel injury
- Malabsorption (B12 & other nutrient)
- Short bowel syndrome (a malabsorption disorder)

Intestinal obstruction

Scar tissue forms after an injury heals which forms fibrous bands (adhesions) between loops of intestine. Usually, these adhesions cause no symptoms, but sometimes another loop of intestine gets twisted under an adhesion.

This twisting can block the intestine and cause abdominal pain and vomiting. Sometimes surgery is required to remove the adhesion and unblock the intestine.



Evisceration :

- Evisceration is the removal of viscera of the abdominal cavity usually due to a penetrating trauma e.g. a stab wound

- If the event is not recognized and treated immediately, exposed intestines are severely contaminated and damaged from trauma.

- Mostly , these patients cannot be saved due to massive devitalization of bowel or secondary injuries.

- Some are treatable and can survive with the help of aggressive medical and surgical management and committed owners.

- The eviscerated bowel should be covered with moistened sterile dressings. It is critical to avoid the temptation to re-insert the eviscerated bowel back into the abdominal cavity.
- Most experts recommend that antibiotics be initiated in the emergency department before the patient is transported to the operating theater.

Case report

A 5-year-old child was admitted to the ER 28 hours after a Motor Vehicle Crash (MVC), complaining of mild abdominal pain. He was febrile (39°C), had a white blood cells count of 18,000 /mL and mild tenderness.

Plain abdominal X-rays & Focused Assessment with Sonography in Trauma (FAST) were negative for free air or free fluid.

The CT scan of the abdomen demonstrated free air and fluid in the retroperitoneal space.

Laparotomy, a perforation of the second portion of the duodenum was found.

- A **single layer suture repair** of the duodenum with **wide drainage was performed**.

- The patient was discharged from the hospital tolerating oral feeding 8 days later

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Thank you