

# Surgical Complications

# Reducing the risks of complication

- Good pre-operative evaluation
- Optimizing the general condition of patients
- Medical issues
- Nutritional issues (malnutrition, obesity)
- Minimizing preoperative hospital stay
- Good surgical technique
- Early mobilization

# Complications

- What operation did the patient have?
- What are the most common complications of this operation?
- What is most life-threatening?
- What co-morbidities does the patient have?

# Overview

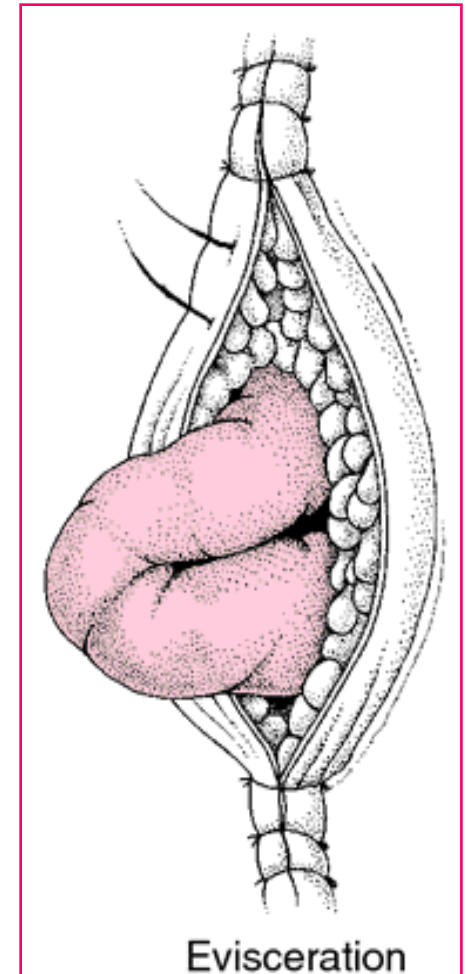
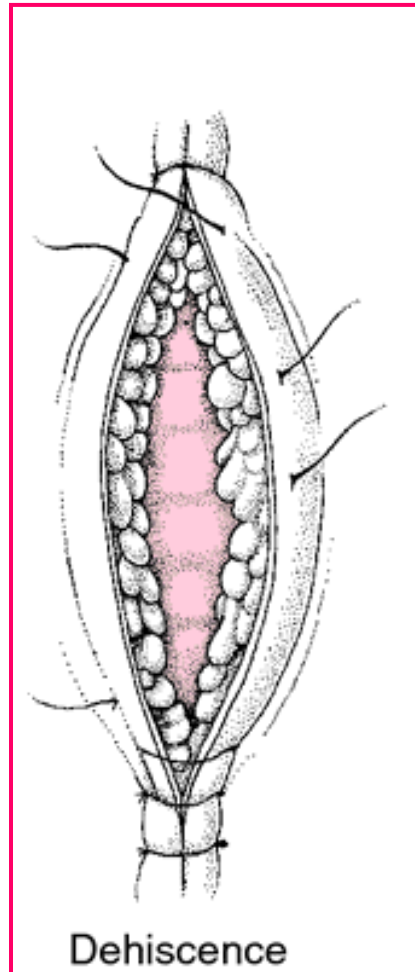
- Post op care has 3 phases
  - Immediate post op care (Recovery phase)
  - Care in the ward before discharging from the hospital
  - Continued care after discharge from the hospital

# Classification

- Wound
- Thermal regulation
- Postoperative fever
- Pulmonary
- Cardiac
- Gastrointestinal
- Metabolic
- Neurological

# Wound Complications

- Dehiscence
- Evisceration
- Seroma
- Hematoma
- Infection
- Incisional Hernia



# What do you do?



# Seroma



- Collection of liquefied fat, serum and lymphatic fluid under the incision
- Benign
- No erythema or tenderness
- **Associated procedures:** mastectomy, axillary and groin dissection
- Treatment: evacuation, pack, suction drains



# Hematoma

- Abnormal collection of blood
- Presentation: discoloration of the wound edges (purple/blue), blood leaking through sutures
- Etiology: imperfect hemostasis
- What is the biggest concern with retained hematoma in the wound?

# Wound Infection

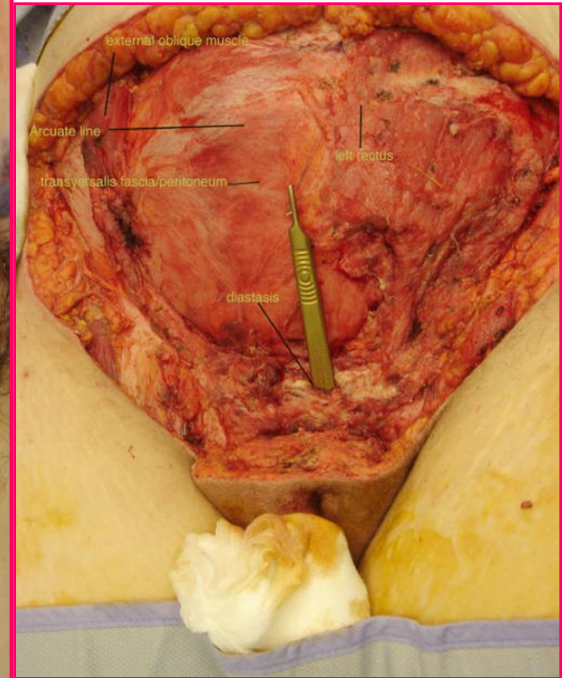
- Surgical Site Infection (SSI)
- Superficial
- Deep (involving the fascia/muscle)
- Presentation: erythema, tenderness, drainage
- Organ Space
- Occurring 4-6 days postop
- Presentation: SIRS symptoms

# Necrotizing Fasciitis



These large, dark, boil-like blisters are a diagnostic symptom of necrotizing fasciitis (also known as flesh-eating disease).

(Source: EMBBS, 1996 <http://mdchoice.com/>)



# Wound Infection

- Group A  $\beta$ -hemolytic streptococcal gangrene – following penetrating wounds
- Clostridial myonecrosis – postoperative abdominal wound
- Presentation: sudden onset of pain at the surgical site following abdominal surgery, crepitus  $\rightarrow$  edema, tense skin, bullae = EMERGENCY
- Necrotizing fasciitis – associated with strep, Polymicrobial, associated with DM and PVD
- Management: aggressive early debridement, IV antibiotics

# Complications of Thermal Regulation

- Hypothermia
- Malignant hyperthermia

# Complications of Thermal Regulation

## Hypothermia

- Drop in temp by 2° C
- Temp below 35 ° C → coagulopathy, platelet dysfunction
  
- Risks:
  - (1) 3x risk increase of cardiac events
  - (2) 3x risk increase of SSI
  - (3) increase risk of blood loss and transfusion requirement

# Malignant hyperthermia

- Autosomal dominant, rare
- Presentation: fever, tachycardia, rigidity, cyanosis
- Treatment: Dantrolene 1 to 2 mg/kg  
→ 10 mg/kg total until symptoms subside

# Postoperative Fever

- What is the number #1 cause of fever POD #1?
- Atelectasis
- Management: IS (incentive spirometry), early ambulation
- Work-up > 48h:
  - H&P
  - Blood cultures
  - UA/urine culture
  - CXR
  - Sputum culture
  - ...then Treat the Fever

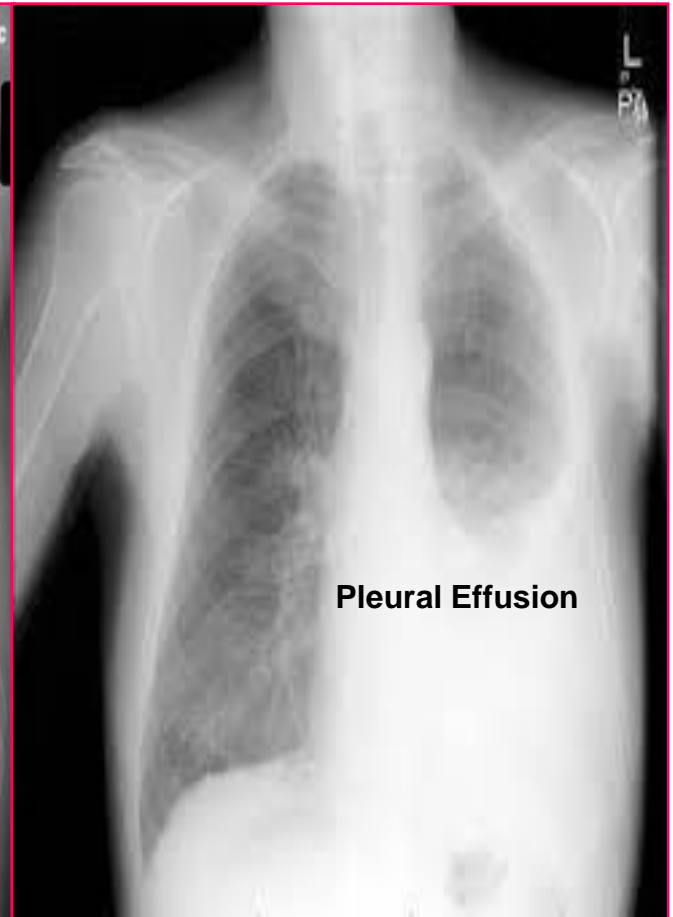
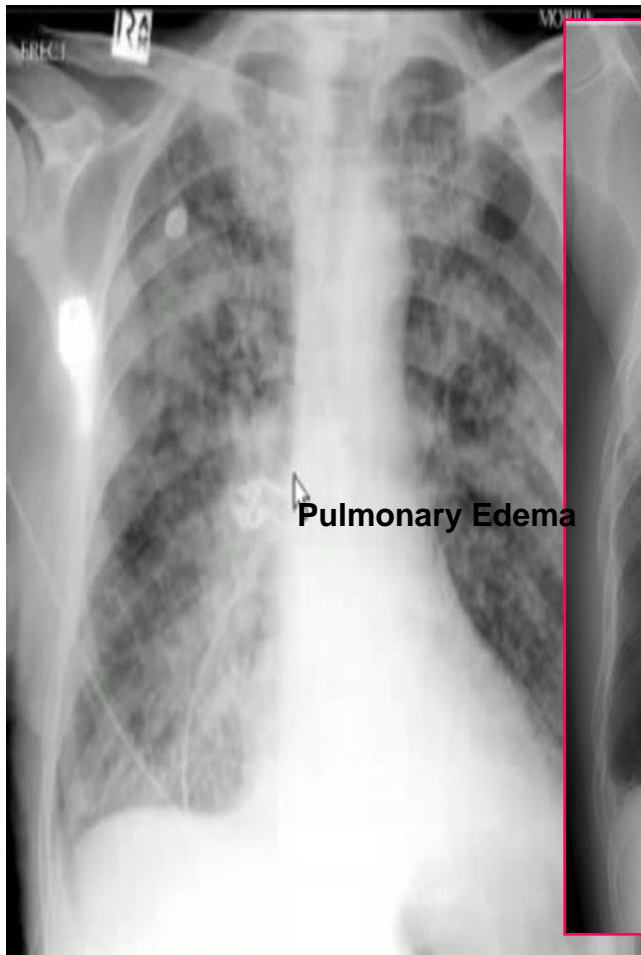


- The 6 W's
- WIND– pneumonia, atelectasis
- WOUND – infection
- WATER – UTI
- WALKING – DVT, possible PE
- WASTE – Abscess
- **What day do we expect abscesses?**
- WONDER – medications

# Pulmonary complications

- Atelectasis – peripheral alveolar collapse due to shallow tidal breaths, MC cause of fever within 48h
- Aspiration pneumonitis – only requires 0.3 ml per kilogram of body weight (20 to 25 ml in adults)
- Nosocomial pneumonia
- Pulmonary edema – CHF, ARDS
- Pulmonary embolus – 1/5 are fatal  
greatest management = prevention

# Chest X-ray



# Cardiac Complications

- Hypertension
  - Ischemia/Infarction
  - Leading cause of death in any surgical patient
  - Key to treatment = prevention
- 
- Arrhythmias
  - 30 seconds of abnormal cardiac activity
  - Key to treatment = correct underlying medical condition, electrolyte replacement (Mg > 2, K > 4)

# Renal Complications

- Urinary retention
  - Inability to evacuate urine-filled bladder after 6 hours
  - 250-300 mL urine → catheterization
  - >500 mL trigger foley replacement
- 
- Acute renal failure
  - Oliguria < 0.5 cc/kg/hr
  - Pre-renal (FeNa < 1)
  - Intrinsic (FeNa > 1)
  - Post-renal (FeNa > 1)

# Gastrointestinal Complications

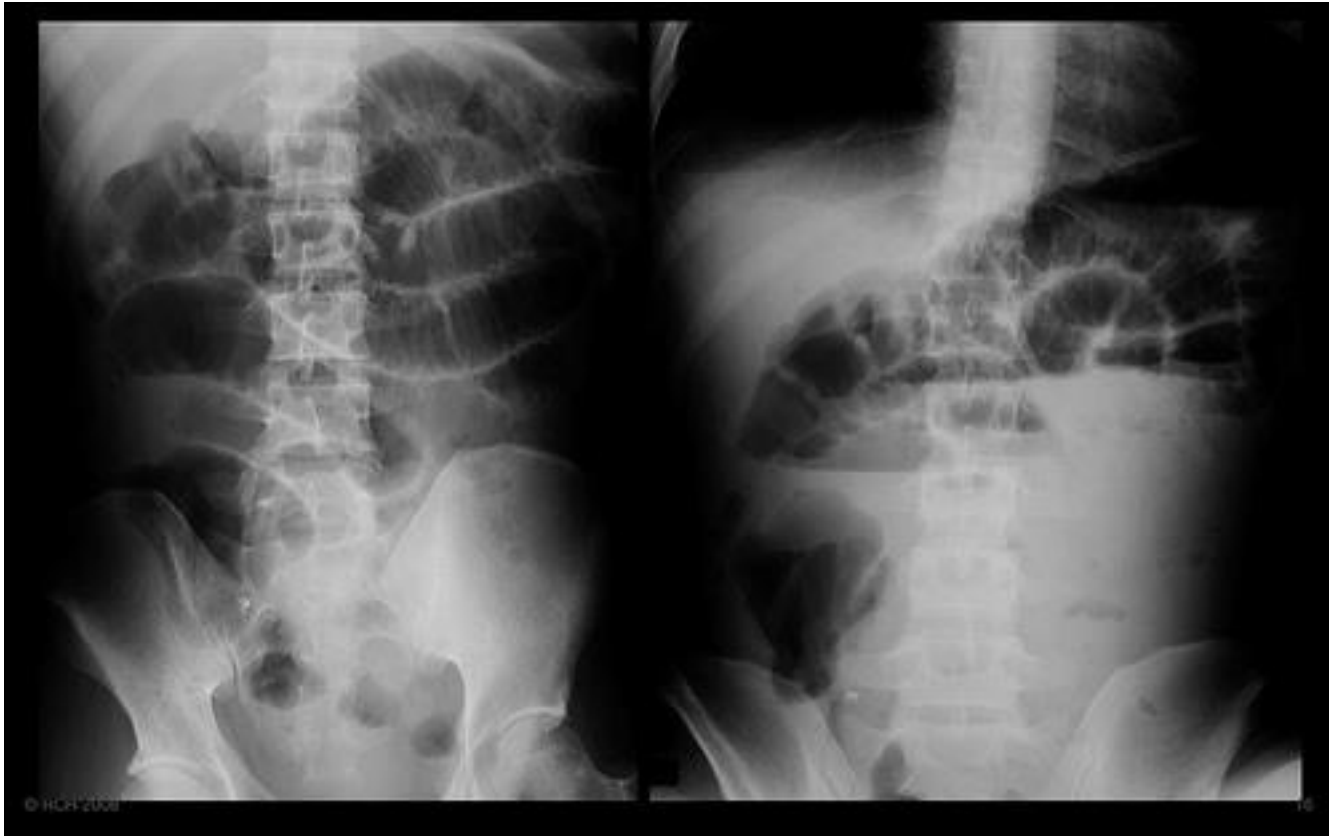
- Postoperative ileus
- GI bleeding
- Pseudomembranous colitis
- Ischemic colitis
- Anastomotic leak
- Enterocutaneous fistula

# Postoperative Ileus



- Lack of function without evidence of obstruction
- Prolonged by extensive operation/manipulation, SB injury, narcotic use, abscess and pancreatitis
- Must be distinguished from SBO

# Small bowel obstruction

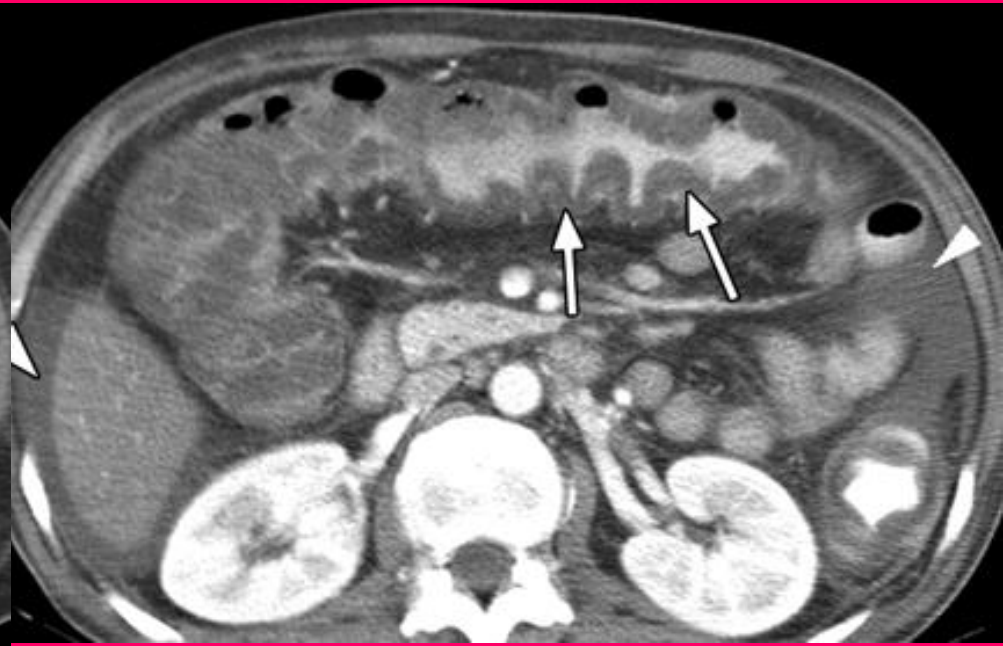
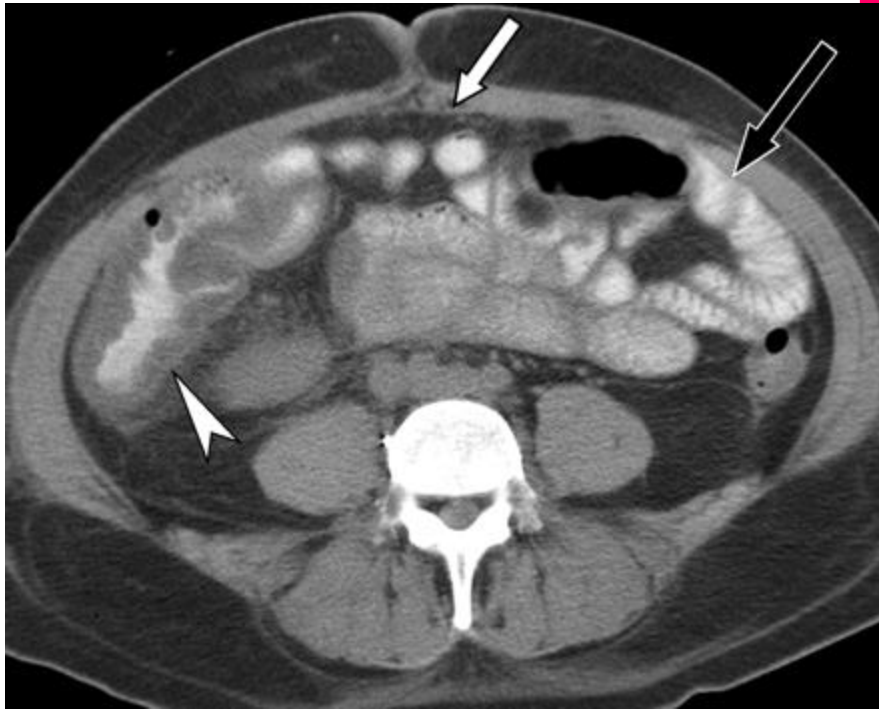




# Gastrointestinal complications

- GI Bleeding
- From any source → get detailed history, place NG tube
- Etiology: Cushing's ulcer (less common with PPI use)
  
- Pseudomembranous colitis
- Superinfection with C difficile due to alteration in normal flora
- Toxic colitis is a surgical EMERGENCY (mortality 20-30%)

# C Diff Colitis



# Gastrointestinal complications

- Ischemic colitis
- Bowel affected helps determine cause
- Surgical devascularization, hypercoagulable states, hypovolemia, emboli
  
- Anastomotic leak
- POD# ?
  
- Enterocutaneous fistula
- The most complex and challenging complication

# Metabolic complications

- Adrenal insufficiency
- Uncommon but potentially lethal
- Sudden cardiovascular collapse
- Presentation: hypotension, fever, confusion, abdominal pain
- Work-up: Stim test with administration of hydrocortisone (baseline cortisol at 30 minutes and 60 minutes)
  
- Hyper/Hypothyroidism
  
- SIADH
- Continue ADH secretion despite hyponatremia
- Neurosurgical procedures, trauma stroke, drugs (ACEI, NSAIDs)

# Neurologic Complications

- Beware the drugs that you will be subscribing
- Delirium, dementia, psychosis
- Seizure disorders
- Stroke and TIA

# Haemorrhage

Immediate:

Inadequate haemostasis , unrecognized damage to blood vessels

Early postoperative:

defective vascular anastomosis , clotting factor deficiency ,  
intraoperative anticoagulants

surgical re-exploring is usually required

Secondary hemorrhage:

Related to infection which erodes blood vessel Several days  
postoperative

treatment of infection