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

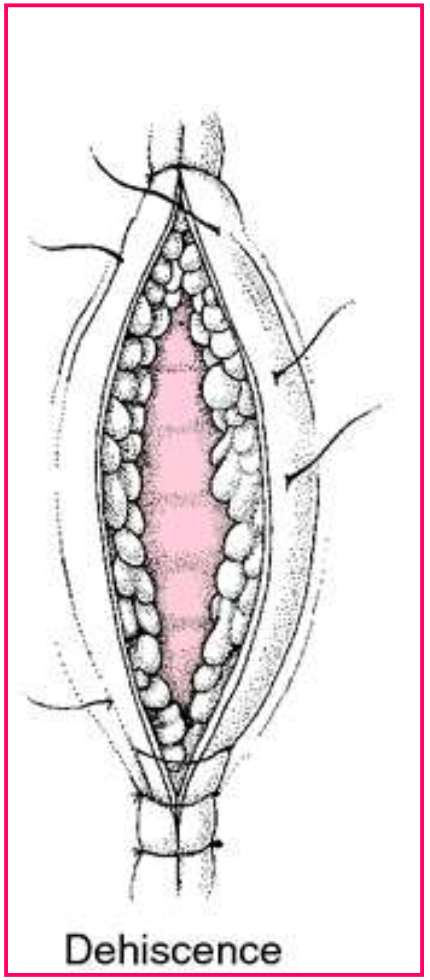
- Post op care has 3 phases
  - Immediate post op care (Recovery phase)
  - Care in the ward before discharging from the hospital
  - Continued care after discharge from the hospital

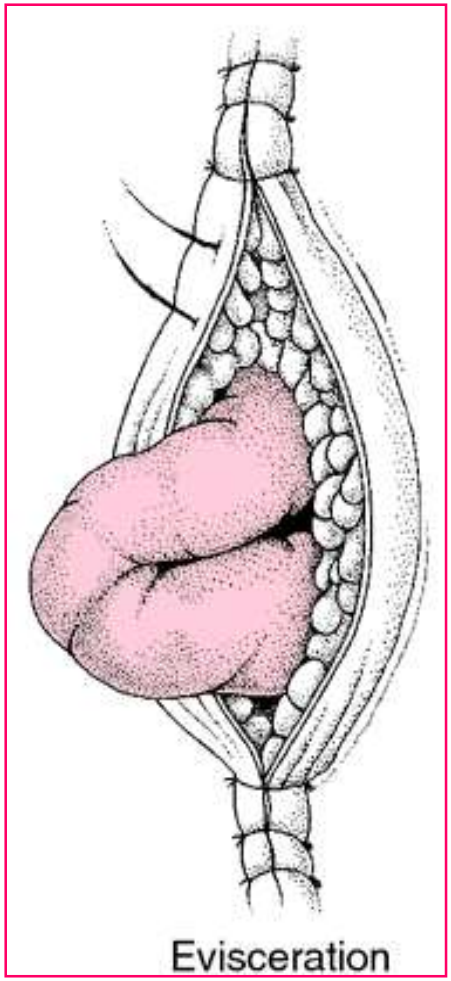
Classification

- 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

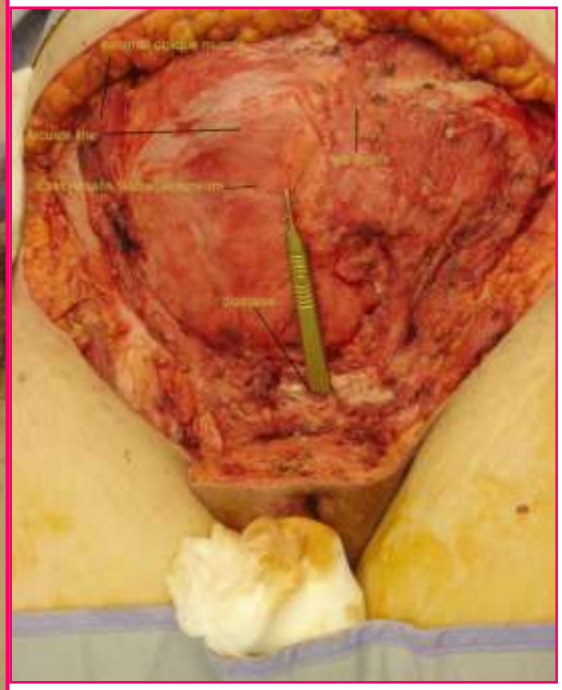
- What is the biggest concern with retained hematoma in the wound?

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, 1998 http://medchoice.com/)



Wound Infection

- Group A β-hemolytic streptococcal gangrene – following penetrating wounds
- Clostridial myonecrosis – postoperative abdominal wound
- Presentation: sudden onset of pain at the surgical site following abdominal surgery, crepitus → 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?**

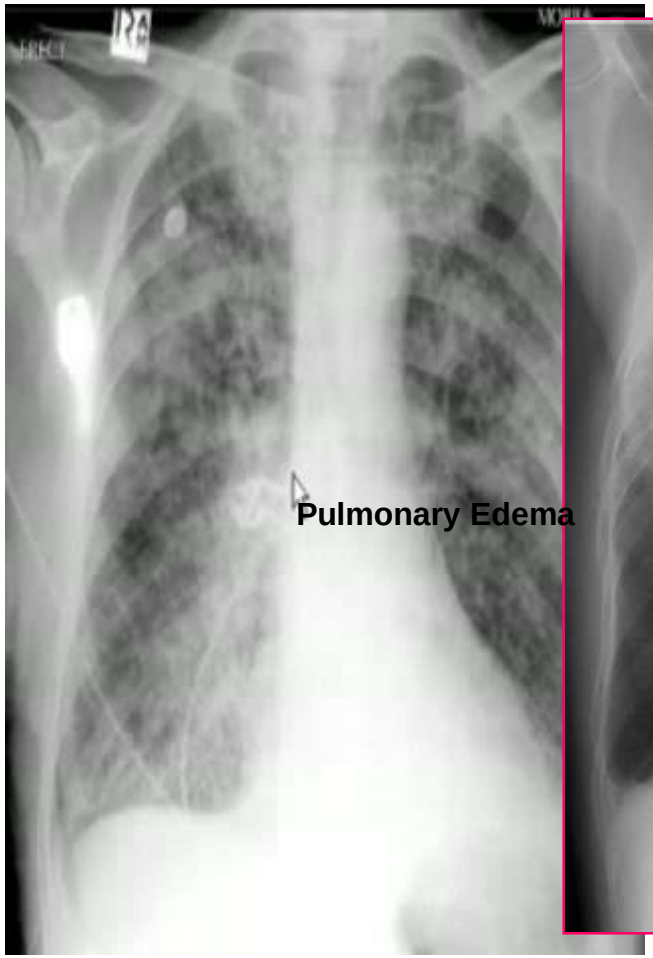
- WONDER – medications

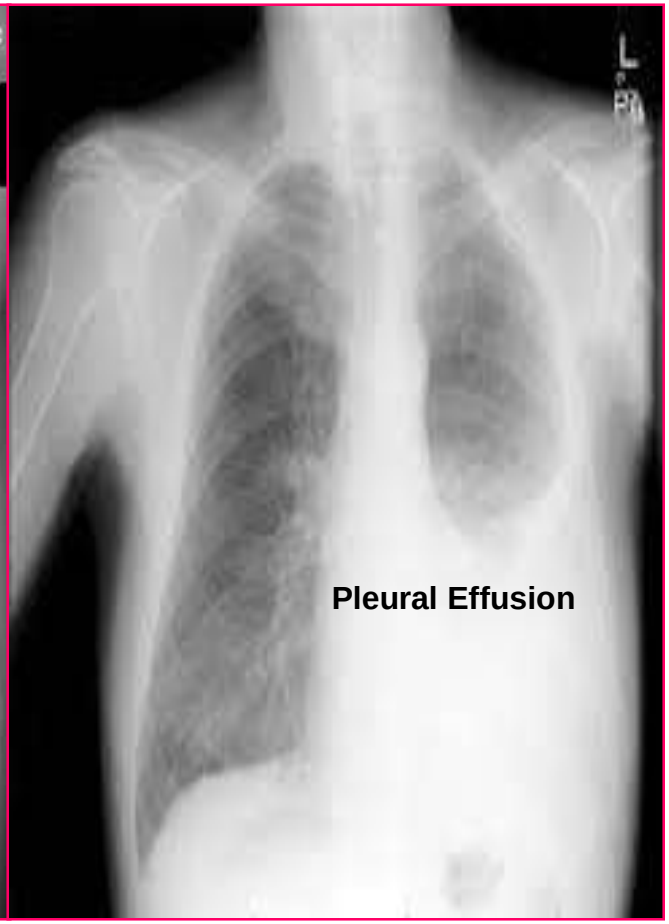
Pulmonary complications

- 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)

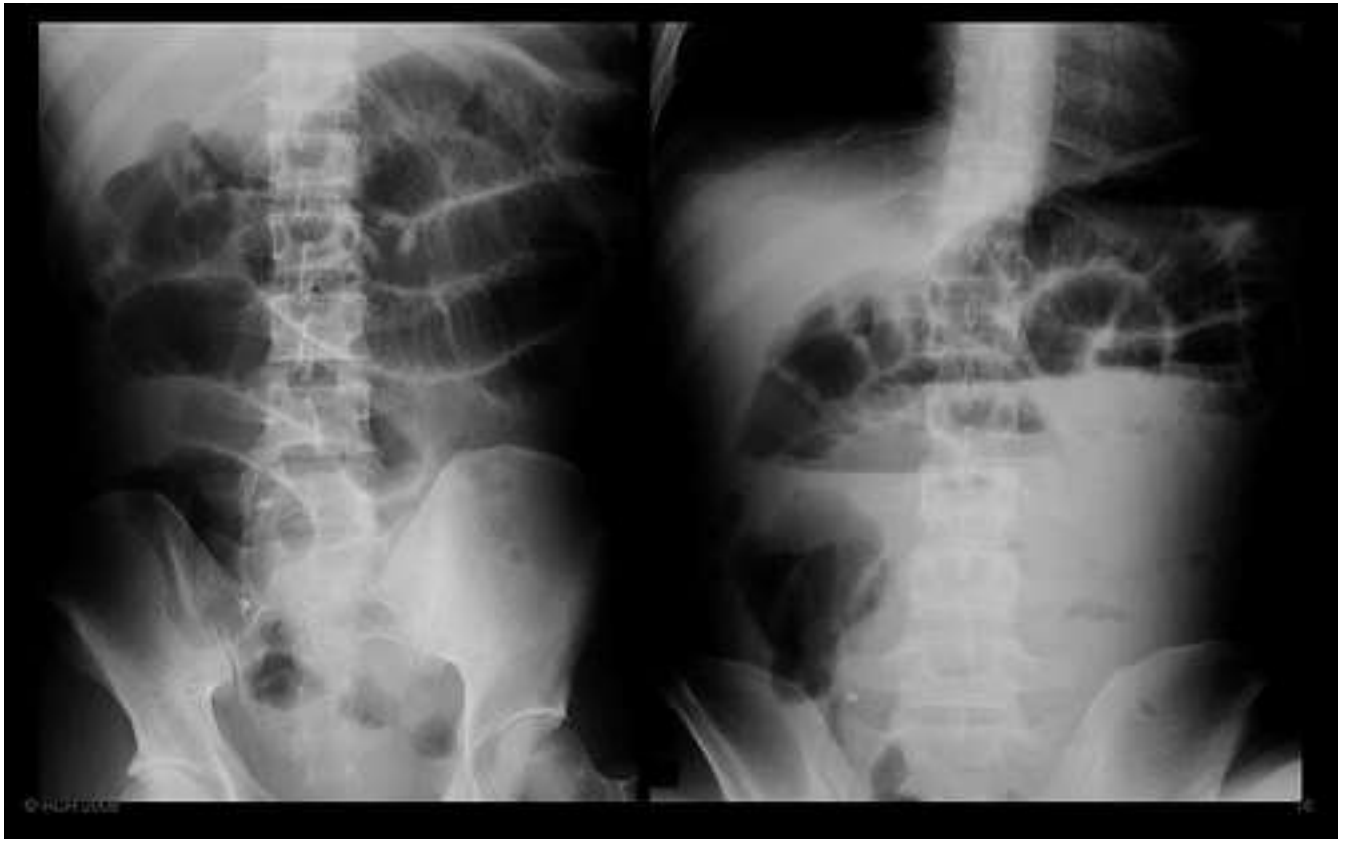
Gastrointestinal Complications

- 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

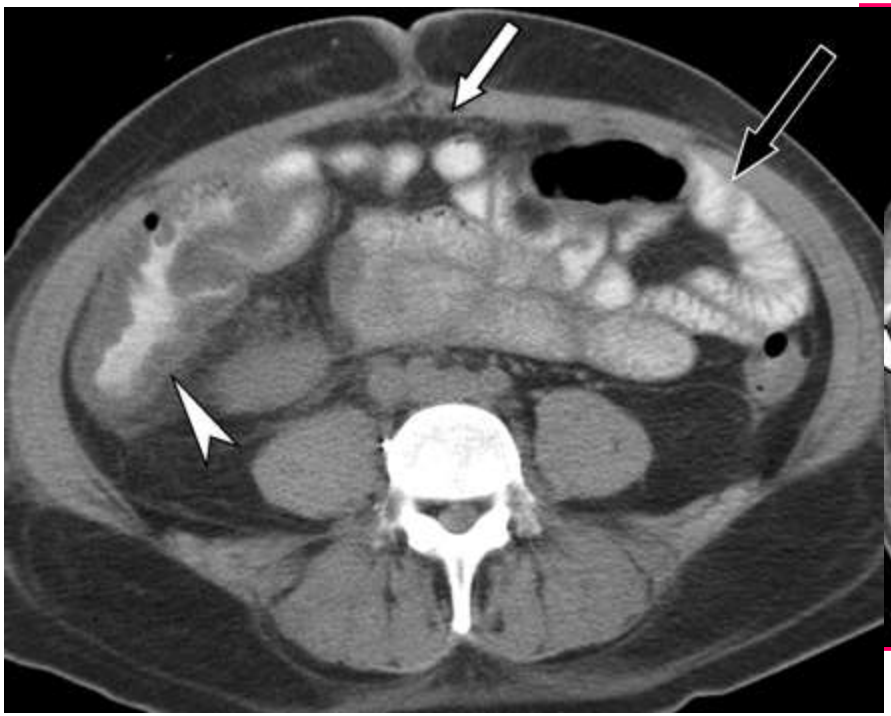


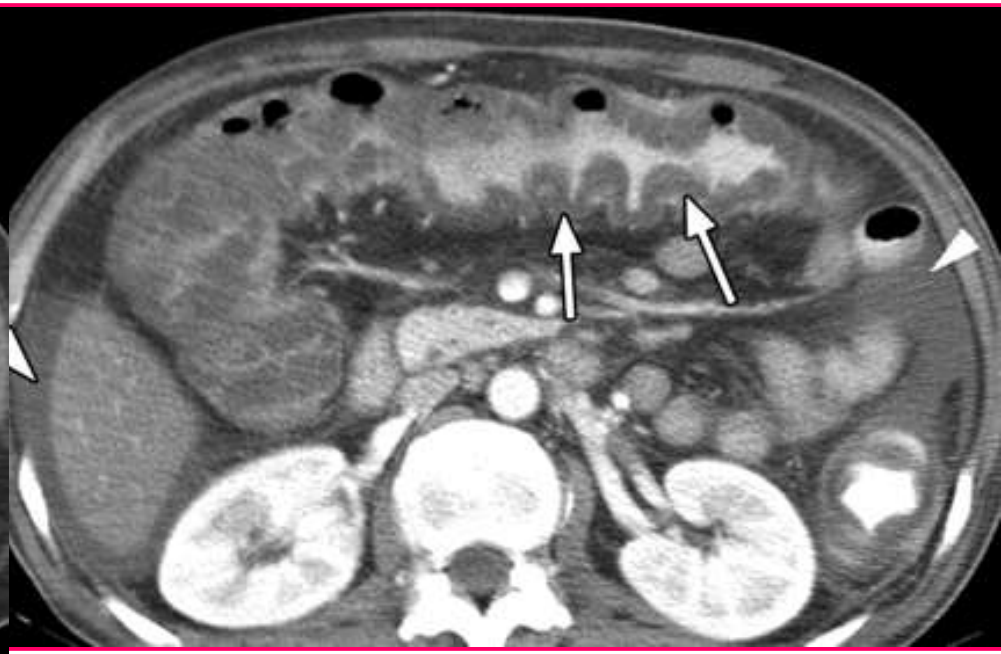
Gastrointestinal complications

- 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