12 General Complications of Surgery

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COLOR GUIDE: • Females' Notes • Males' Notes • Important • Additional

Objectives

Were not given!

Pre & Post Operative Care and Surgical Complications

Note(s):

Surgery always needs pre-op assessment, post-op assessment and post-op follow up.

Pre Operative evaluation:

- History & Physical Examinations
- Investigations and Radiologic diagnostic Tools
- Routine lab, EKG, etc.

Note(s):

Pt. 35 known case of gallstone. Bluish coloration around the umbilicus and the right flank. What are the signs?

✓ *Around the umbilicus: Cullen's sign*
✓ *Flank: Turner's sign*

Turner's and Cullen's ➔ ***hemorrhagic pancreatitis***

✓ *Bluish discoloration on the inguinal ligament: Fox sign*

Based on the signs you find (in PEx) you can change the management!

Note(s):

Investigation guideline assessment pre-op.:

- *Pt. age more than 40 ➔ do Chest X-ray and ECG regardless if he has symptoms or not.*
- *Pt. heavy smoker + have symptoms ➔ Chest x-ray and ECG regardless of the age.*
- *Pt. with a problem with in his blood ➔ coagulation profile.*

431: If a patient diabetic, refer him/her to endocrinologist for consultation to assess and manage the level of glucose before surgery.

Pre-operative Preparation:

- Testing
    a. Determines ability to sustain surgical insult. Ex: Stress test to obese patients before bariatric surgery
    b. Determines type of anesthesia delivery
    c. Blood Pressure, Diabetes, EKG, Liver function, CBC, Chest X-ray, UA
- Medications
    a. Day before surgery, anti-inflammatory
    b. Day of surgery, antibiotics
    c. Post op pain meds
    d. Smoking cessation?

Note(s):

- *There are some medications that are given by the anesthesiologist and others by the surgeon. ANTIBIOTICS are given by the surgeon. When? **30 min to one hour before** the surgery, we want the peak of the antibiotic during the surgery. "Antibiotics to prevent surgical site infections" Why? To prevent wound infections. "In real life: They give on table."*

- *When to stop smoking? **6 weeks before** surgery, because it decreases wound healing and increases rate of infection.*
- *Aspirin should be stopped 5 days before surgery and Plavix (Clopidogrel)7 days*

Patient/Procedure Confirmation:

- Surgical Consent "Explain the risks and benefits"
- Pre-operative marking
- "Time Out" in the operating room

Marking to prevent mistakes.

Note(s):

Time out? Calling out the name of the pt., file number, the doctor, the procedure and all the other important information on the table before starting the surgery.

Types of Injuries:

- Wrong site, wrong procedure
- Wrong medication
- Skin breakdown/decubiti
- Burns
- Nerve damage "it can happen with wrong positioning"
- Ischemia
- Eyesight "if they didn't close the eyes during the surgery ➔ dry eyes ➔ ulcer"

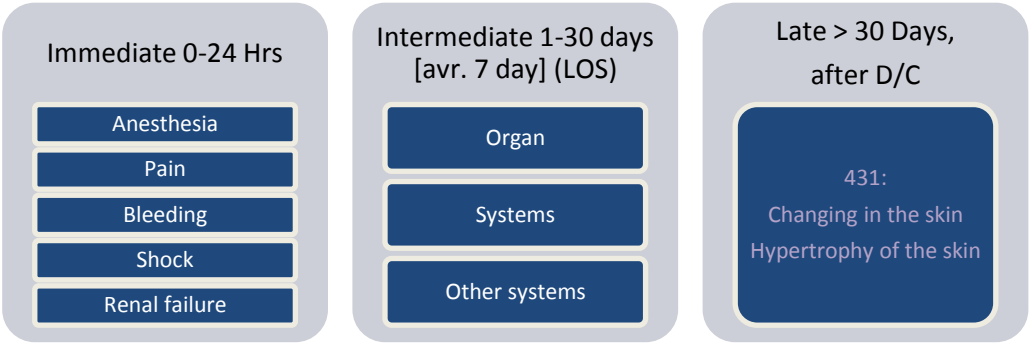
Classification of Post Operative Complications

1. Avoidable (Preventable, non Preventable)
2. Physiological, Biochemical; Anemia, Coagulopathy
3. **Related to timing:**

Note(s):

Morbidity: complications.
Mortality: death.

✓ *When you present a case you should classify it.*
E.g.: Preventable physiological early post-op complication.

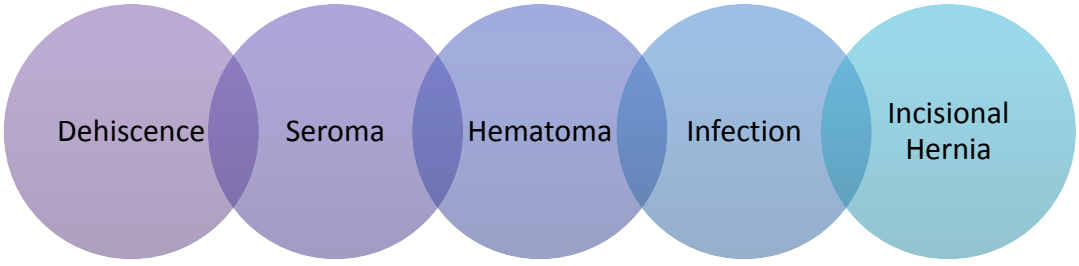


Surgical Complications:

- Wound
- Thermal Regulation
- Postoperative Fever
- Pulmonary
- Cardiac
- Renal
- Gastrointestinal
- Metabolic
- Neurological
- Primary disease Ex: Addison Dis.
- Operation
- Unrelated factors
- Complications leading to other complications→Anemia lead to MI

Prevention! is the most important treatment for those complications

Wound Complications:



Dehiscence:

- Separation of facial layers "but organs are still inside"
- Serosanguinous drainage
- Technical Complication
- Risk Factors
- Mortality approaches 30%
- Evisceration is the opposite of it! "Organs are outside"

Dehiscence

Evisceration

Seroma: "if the surgeon wasn't delicate; there will be seroma: breakdown of lymphatic channels"

- Collection of liquefied fat, serum and lymphatic fluid under the incision
- Benign
- No erythema or tenderness
- Mastectomy, axillary and groin dissections
- Treatment "if the pt has symptoms ➔ drain it, no symptoms ➔ it will disappear with time"

Hematoma:

- Abnormal collection of blood
    a. Discoloration of the wound edges (purple/blue)
    b. Blood leaks through skin sutures
- Imperfect hemostasis
- Potential for secondary infection
- Neck hematomas can be dangerous
- Treatment "if the pt has symptoms ➔ drain it, no symptoms ➔ it will disappear with time"

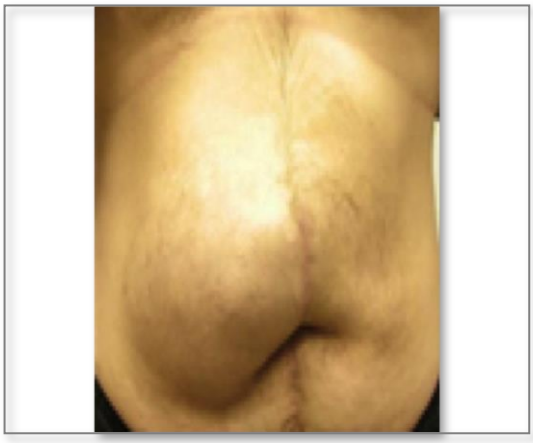
Wound Infection

- Major problem
- Superficial
- Deep
- Organ space
- Most commonly occur 4-6 days post-op
- Erythema, tender, edema
- 2.5% of abdominal incisions
- Most common organism: **Staphylococcus aureus**
- Necrotizing fasciitis
    a. Bacterial infection of underlying fascia
    b. Classically **Streptococcus** **(MCQ)**, most often polymicrobial with anaerobes/GNR
    c. Surgical debridement and IV antibiotics
- Clostridial Myosistis
    a. Clostridial muscle infection (myonecrosis and gas gangrene)
    b. Clostridium perfringens
    c. Surgical debridement and IV antibiotics

Note(s):

- ***Most common** organism is strept.*
- ***7-10 days** post-op + fever = wound infection.*
- *Except in one case: When the organism is group A strept. (Necrotizing fasciitis) it will happen in the **first 24hrs***
- *431: 2 organisms could cause infection in the first day (clostridium and group A streptococcus)*

Within 24 hrs. Bullae. Doesn't respond to treatment. Mark the area with a pen, it will increase in size. Dx: Biopsy



Any hernia post surgery is incisional hernia. ASK the pt.: To cough and if it's reducible or not.

Complications of Thermal Regulation:

- Hypothermia
- Malignant Hyperthermia

Hypothermia:

- Drop in body temperature of 2 degrees C
- Causes
- Body's Response
- Temperature below 35 C
- Coagulopathic
- Platelet dysfunction
- Mild - 32 – 35C = 90-95F
- Mod – 28 – 32C = 82–90F
- Severe – 25 – 28C = 77-82F
- Extreme

Note(s):

- ✓ *We have to check the patient's temperature before the surgery.*
- ✓ *We shouldn't give the pt. cold water*
- ✓ *Blood transfusion: you have to warm it before giving it to a hypothermic pt.*

Malignant Hyperthermia:

- Rare; autosomal dominant "usually caused by Succinylcholine which is used in anesthesia"
- Fever, tachycardia, rigidity, cyanosis
- First sign is increased end tidal CO2
- Often within 30 minutes
- Treatment: **Dantrolene**, correct electrolytes, cooling blanket

Postoperative Fever:

- The Six W's
    a. Wind: pneumonia
    b. Wound: infections
    c. Water: UTI
    d. Walking: DVT (possible PE)
    e. Waste: abscess
    f. Wonder Drug: medication
- Noninfectious
    a. Within the first 48-72 hours

- Infectious
    a. Fevers POD 3-8
- Standard work up includes
    a. Blood cultures
    b. UA and Urine Cultures
    c. CXR
    d. Sputum cultures
    e. Tylenol/Motrin

Pulmonary Complications:

- Atelectasis
    a. Peripheral alveolar collapse due to shallow tidal breaths
    b. Most common cause of fever within 48 hours of surgery
    c. Incentive spirometry
- Aspiration Pneumonitis
    a. Reduced by pre-op fasting, protonix, cricoid pressure
- Nosocomial Pneumonia
- Pulmonary edema
    a. CHF
    b. ARDS
- Pulmonary embolus
    a. 500,000 per year
    b. 1 in 5 are fatal
    c. Prevention

Cardiac complications:

- Hypertension → severe bleeding → MI
- Ischemia/Infarction
    a. Leading cause of death in any surgical patient
    b. Key to treatment: prevention
    c. MONA
- Arrhythmias
    a. >30 seconds of abnormal cardiac activity
    b. Key to treatment is to correct underlying medical condition

Note(s):

The most important cause of cardiac complications: poor assessment of the pt pre-op.

Renal Complications: imp.

- Urinary retention
    a. Inability to evacuate a urine-filled bladder
    b. Commonly a reversible abnormality
    c. Perianal and Hernia repairs
- Acute Renal Failure
    a. Pre-renal
    b. Intrinsic
    c. Post-renal

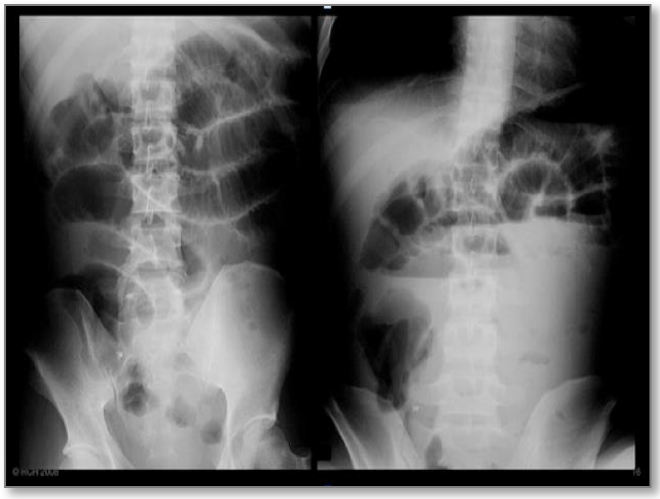
> ***Note(s):***
>
> *If a pt. has no symptoms of any renal disorder pre-op but after the surgery I find that his urine output is low, I have to order urine electrolytes.*
> *Na\K NORMAL ➔ PRE-RENAL problem*
> *Na\K ABNORMAL ➔ RENAL problem*

Gastrointestinal Complications:

- Postoperative ileus
    a. Lack of function without definitive obstruction
    b. Prolonged by extensive operative manipulation, SB injury, narcotic use, abscess and pancreatitis
    c. Must be distinguished from SBO
    d. Flat and Upright abdominal film
        i. Ileus: dilated bowel throughout, air in colon and rectum
        ii. SBO: air fluid levels, no colonic or rectal air
- GI Bleeding
    a. From Any source (get a detailed history)
    b. Gastric "stress" ulcers (Curling's Ulcer)
        i. Uncommon with invention of H2Blockers and PPIs
- Pseudomembranous colitis
    a. Superinfection with C difficile
    b. Alteration of intestinal flora by perioperative antibiotics
    c. Toxic colitis is a surgical emergency (mortality of 20-30%)
- Ischemic Colitis
    a. Bowel affected helps determine cause
    b. Surgical devascularization, hypercoagulable states, hypovolemia and emboli
- Anastomotic leak
- Enterocutaneous fistula
    a. The most complex and challenging surgical complication

Ileus

Bowel obstruction



Ileus (air at the rectum + NO air fluid level + dilatation of all small intestine)
Bowel Obstruction (air fluid level present + no air at the rectum)

Metabolic Complications:

- Adrenal Insufficiency
    a. Uncommon but potentially lethal
    b. Sudden cardiovascular collapse
        i. Hypotension, fever, confusion, abdominal pain
    c. "Stim" test, administration of hydrocortisone
        i. Baseline serum cortisol, 30 min, 60 min
- Hyper/Hypothyroidism
- SIADH
    a. Continued ADH secretion despite hyponatremia
    b. Neurosurgical procedures, trauma stroke, drugs (ACE-I, NSAIDs)

Neurologic Complications:

- Beware the drugs you will be prescribing
- **Delirium**, Dementia and Psychosis
- Seizure Disorders
- Stroke and Transient Ischemic Attacks

Note(s): "very important"

At Day 0 the pt. with fever could have:

1. *Pt. receive medication intra-op "drug reaction"*
2. *Missed pre-op infection (pneumonia)*
3. *Blood transfusion*
4. *Cancer*
5. *Malignant hyperthermia*

At Day 1 the pt. with fever could have:

1. *Atelectasis*
2. *Pneumonia*
3. *Wound infection* ***(group A strept. E.g. necrotizing f.)***

At Day 2 the pt. with fever could have:

1. *Thrombophlebitis*
2. *Bad Atelectasis*

At Day 3-5 the pt. with fever could have:

1. *UTI*

At Day 5-7 the pt. with fever could have:

1. *PE*
2. *Thrombosis*

At Day 7-10 the pt. with fever could have:

1. *Wound infection*

Note(s):

Cases that were mentioned by the doctor:

✓ ***Pt with DM - uncontrolled - on insulin, and he's going to the OR. What are afraid of in this case?***

Infection + decrease wound healing.

✓ ***Pt. with SLE on steroids, you want to book him for a surgery what do you do?***

The adrenal is depending on the steroid and it's not producing hormones, we have to increase the dose (stress-dose "3times more") before the surgery so there won't be adrenal crises.

✓ *Pt. is obese with chronic cough you want to book him for inguinal hernia repair?*

I should control cough and constipation if there was, and then do the surgery to prevent recurrent of hernia.

Risk factors of hernia:

Chronic cough and chronic constipation: increase internal abdominal pressure and lead to hernia.

✓ ***Uncontrolled hyperthyroidism pt., he was booked for a surgery and after that he started to have atrial fibrillation. What is the most common cause of his atrial fibrillation?***

Uncontrolled Hyperthyroidism (preventable).

SUMMARY

1. Antibiotics administered 1/2 to 1 hour before surgery
2. Smoking must be stopped 6 weeks before surgery
3. Necrotizing fasciitis classically caused by group A Streptococcus
4. Malignant hypothermia treated with dantrolene
5. Most common GIT complications are ileus and obstruction.
6. Delirium is common in ICU during first 3 days

Questions

1) Patient using aspirin will undergo surgery next month, when he should stop it before surgery?
   a. 4 days
   b. 5 days
   c. 6 days
   d. 7 days

2) All of the following complications happened at day 0 classically except:
   a. Malignant hyperthermia
   b. Medication reaction
   c. Blood transfusion reaction
   d. Atelectasis

3) Breakdown of layers and the organ is protruded outside is called:
   a. Seroma
   b. Dehiscence
   c. Evisceration
   d. Hematoma

Answers:

1st Questions: B

2nd Questions: D

3rd Questions: C