Postoperative pyrexia

Dr. Md. Ashek Mahmud Ferdaus
FCPS (SURGERY), MS (Colorectal Surgery), FISCP(India).
Fellow International Society of Coloproctology.
Assistant Professor (Colorectal Surgery)
Mymensingh Medical College.

Any postoperative elevation of body temperature more then 1°C above normal should be considered significant and the cause should be investigated.

Fever – Basic mechanism

Endotoxin , Inflammation

|

Monocyte, Macrophage

| IL-1,IL-6,IFN,TNF

Preoptic area of Hypothalamus

| PGs

Raise temperature set point

|

Fever

Incidence

- 40% major surgery -suffer pyrexia.
- 80% of which have no specific aetiology.
- Rest 20% - Infectious cause.
- Infection is the only headache of post operative pyrexia.

SUGGESTIONS OF INFECTION

- Preoperative trauma.
- ASA class – above 2.
- Fever after 2nd P.O.D.
- Initial temperature above 38.6 degree Celsius.
- T.C. >10000/µl.
- B.U.N.>15mg/dl. (normal up to 7mg/dl).

ASA Class

- American society for Anaesthesiologist – ASA
- Class 1 – Healthy patient.
- Class 2 – Mild systemic disease, no functional limitation.
- Class 3 - Moderate systemic disease , definite functional limitation.
- Class 4 – Severe systemic disease ,constant threat to life.
- Class 5 – Moribund patient, not expected to survive >24hours without surgery.

Causes :

During operation-

- Preoperative sepsis or hyperthermia.

Immediate postoperative period (first 6 hours)-

- Metabolic or endocrine abnormality (thyroid crisis, adrenocortical insufficiency).
- Prolonged hypotension with inadequate tissue perfusion.

Mnemonic of Causes-

5 W's.

- Wind, POD1-2: the lungs, i.e.
  - Pneumonia.
  - Aspiration.
  - Pulmonary embolism.
  - Atelectasis.
- Water, POD3-5:
  - UTI.
  - Thrombophlebitis.
  - Drain tube infection.
- Walking (or VEINS, which then sounds like "Weins"), POD4-6:
  - DVT.
  - Pulmonary embolism.
- Wound, POD5-7:
  - Wound infection.
- Wonder drugs or “What did we do?”, POD7+:
  - Drug fever,
  - Infections related to IV lines.

Investigations

Depends upon individual pathology behind it.

- Chest X ray , sputum for culture ,ECG (pulmonary embolism).
- Wound swab.
- Urine R/M/E.
- Signs of DVT (Homan's , Moses test).
- Examine catheter , cannula sites.
- Examine pressure areas.
- T.C. , D.C. , Blood Culture.
- CT scan , Tumor marker -Consider hidden malignancy.
- Ultrasonography, CT scan -Consider hidden infection (Sub-phrenic , Pelvic abscess).

General Management

- Most patients require no specific treatment.
- Subsides spontaneously.
- Infection requires treatment.

General Management

- Fever increases fluid losses and energy requirements as below-
  - Sensible loss increases by approx. 250ml/day/°C
  - Insensible loss increases by approx. 250ml/day/°C
  - Calorie requirement increases by 5%/°C rise in temperature.

  Therefore these should be replenished.
- Primary treatment consists of treating its cause and not the fever itself. i.e.
  - Changing or removing the cannula or catheter,
  - Early mobilization to prevent respiratory infection or DVT,
  - Broad spectrum antibiotic.
  - Antipyretics, tapid sponging etc.

Specific Causes And Management

They are first diagnosed and then managed.

Pulmonary problem

- 1st & 2nd POD.
- Atelectasis & pneumonia.
- Early mobilization.
- Respiratory physiotherapy.
- Adequate fluid management.
- 3 A
    - Antibiotics.
    - Analgesics.
    - Areation.

Pulmonary care

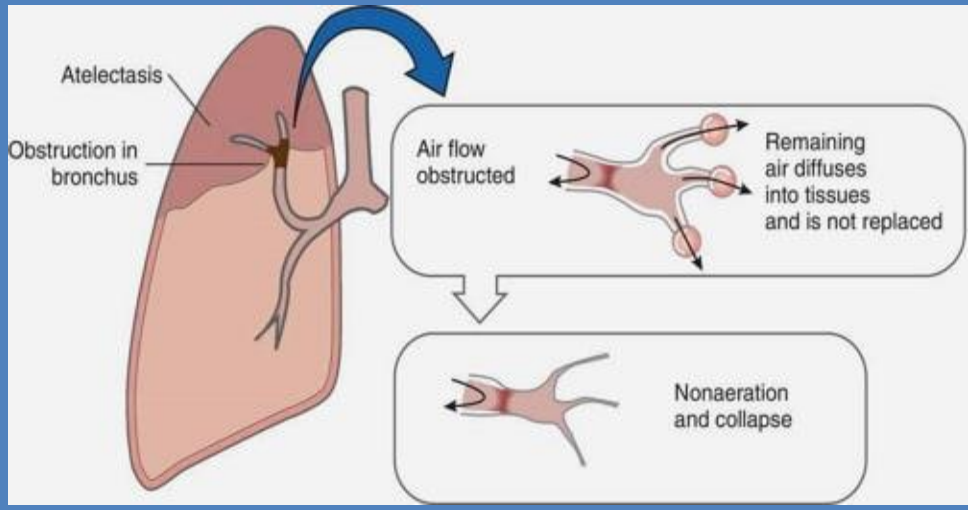
- FRC & VC reduces upto 40% pre-op level.
- Go up slowly upto 60-70% by 6^{th} -7^{th} POD.

Aggravated by-

- Obesity.
- Smoking.
- Pre- existing lung diseases.
- Elderly.
- Pain.
- Abdominal distension.

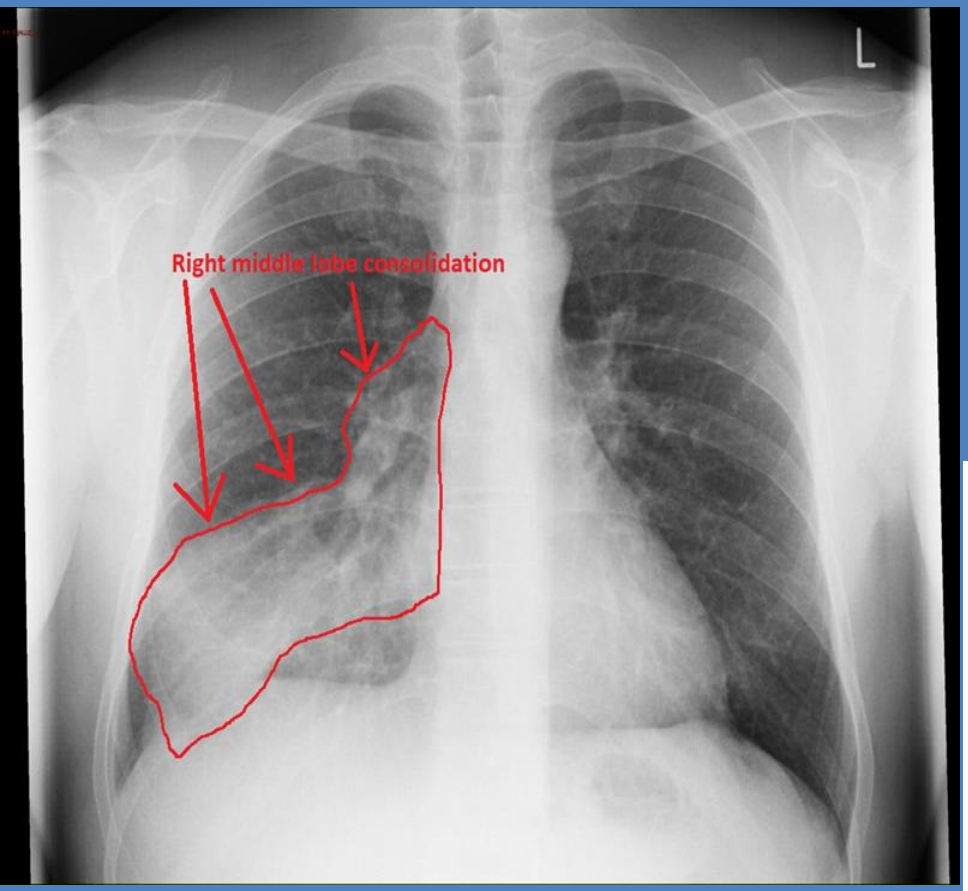
Atelectasis

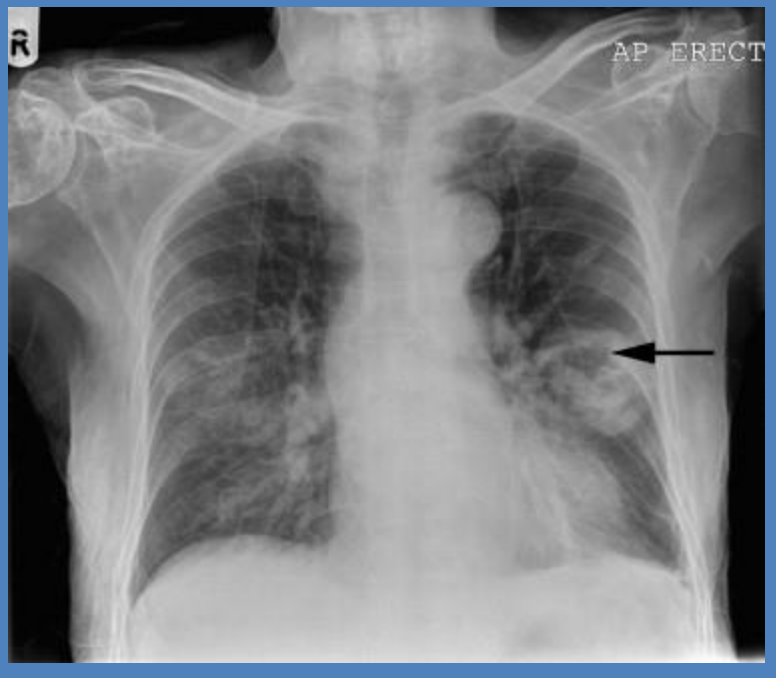
- Complete or partial collapse of the entire lung or area (lobe) of the lung.
- Alveoli within the lung become deflated or possibly filled with alveolar fluid.
- Fever during first 48 hours usually is due to atelectasis. (90%).



25% of GI surgery is associated with it.

Segmental
Focal patchy





Old age
Smoking
Obesity
Previous respiratory disease

Segmental (or subsegmental) consolidation

Clinical Feature

Symptoms-

Fever (Unknown etiology)

Tachypnea

Tachycardia.

Signs-

Elevated diaphragm.

Rales- Rhonchi.

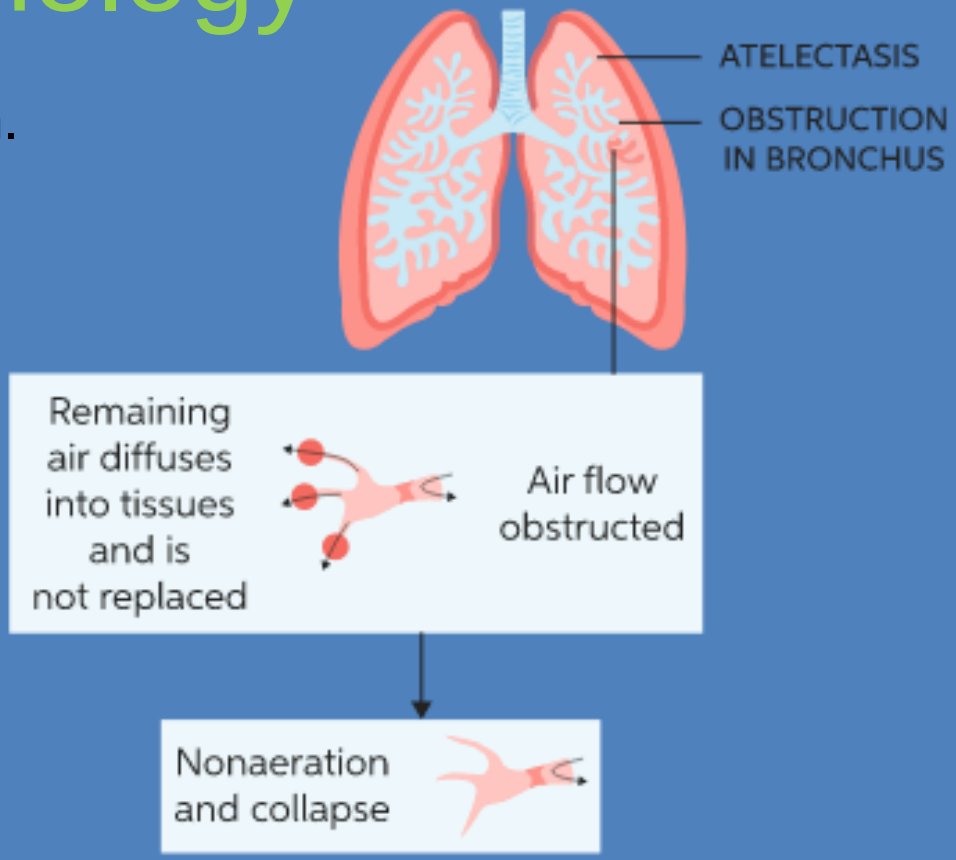
Decreased breath sound.

Pathology

- Ventilation perfusion mismatch.
- Infection.

Obstuctive-

- Secretion from COPD.
- Intubation.
- Anesthetic agent.
- Blood clot.
- Malposition of ET tube.



Non-Obstructive-

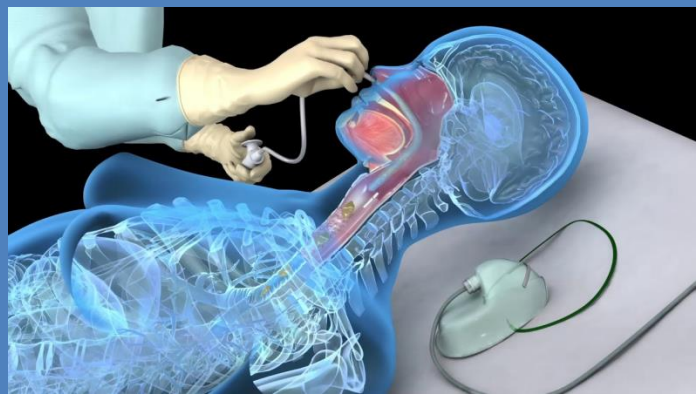
- Bronchiole closure at closing volume of lung.
- Less surfactant.
- Low FRC.

Prevention

- Early mobilization.
- Freq. change of posture.
- Encourage coughing.
- Breathing exercise.

Treatment

- Assisted cough.
- Chest percussion.
- Naso-tracheal suction.
- Rx of COPD if present.



Dressing change

- Aseptic technique.
- Emergency surgery- 3rd POD.
- Routine surgery- 4th or 5th POD.
- Soaked- change as early as possible.

Types of drain

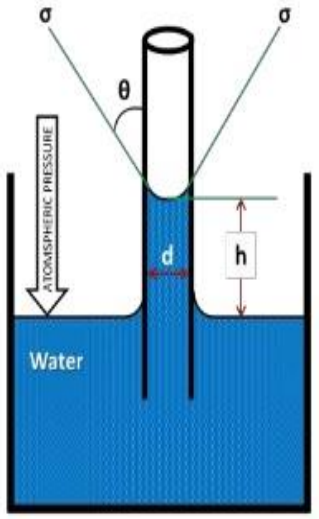
- Closed drainage- air tight circuit.
- Open drainage-drains out on a dressing.
- Suction drainage-uses pump or mechanical device.

Principles of drain

- Open drain- gravity.
- Semi open drain- capillary action.
- Closed drain- utilize suction.

CAPILLARITY RISE

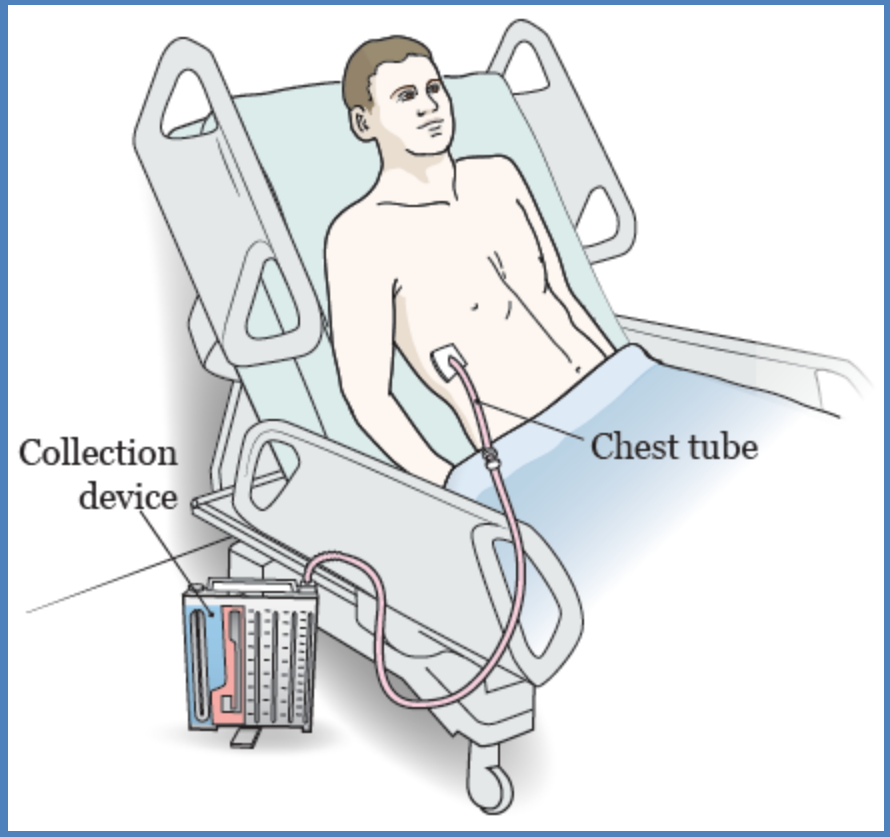
- Tendency of liquids to rise in tubes of small diameter in opposition to, external forces like gravity



Siphonic action

Special drains

- Chest drains.
- T- tube drains.
- Guided drainage.



Drain removal

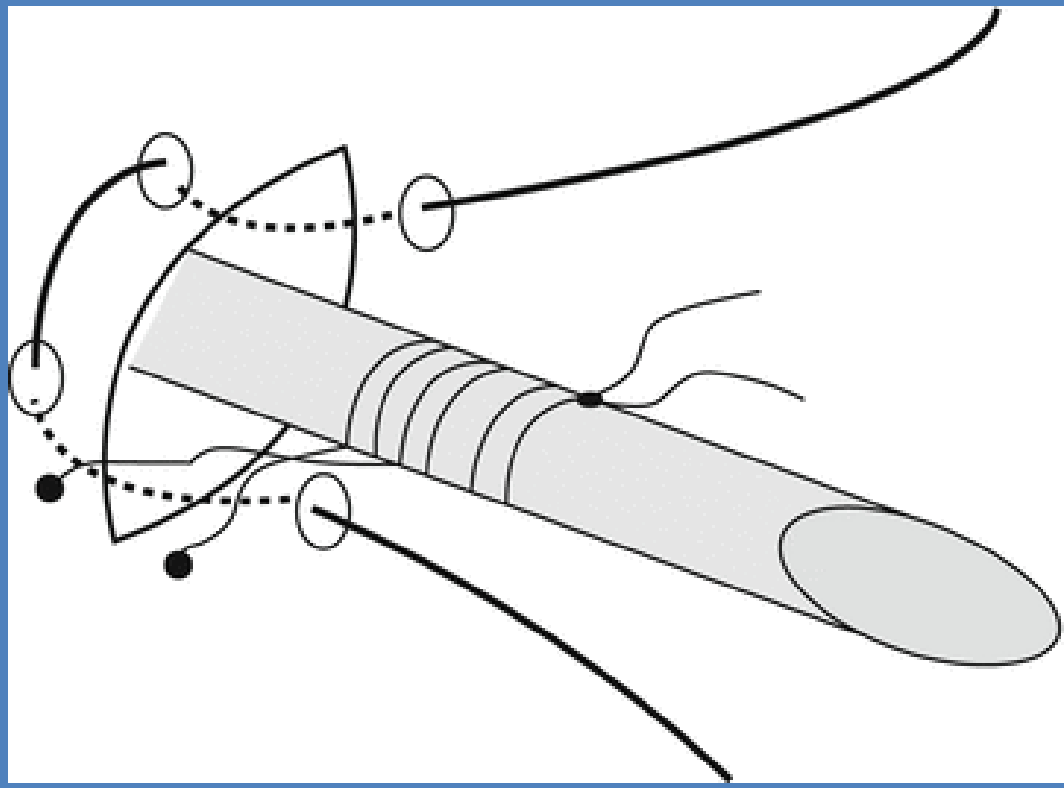
- By 7 days only 20% drains remain functioning.
- Raise wound infection.
- Removed as soon as possible.
- Not to remain in contact with anastomotic sites.

Principles of drain removal

- Thyroidectomy –perioperative bleeding-after 24 hrs.
- Mastectomy- serous collection-after 5 days.
- Infection-until infection is subsided.
- Colorectal anastomosis- 5-7 days.
- T – tube after 10 days.

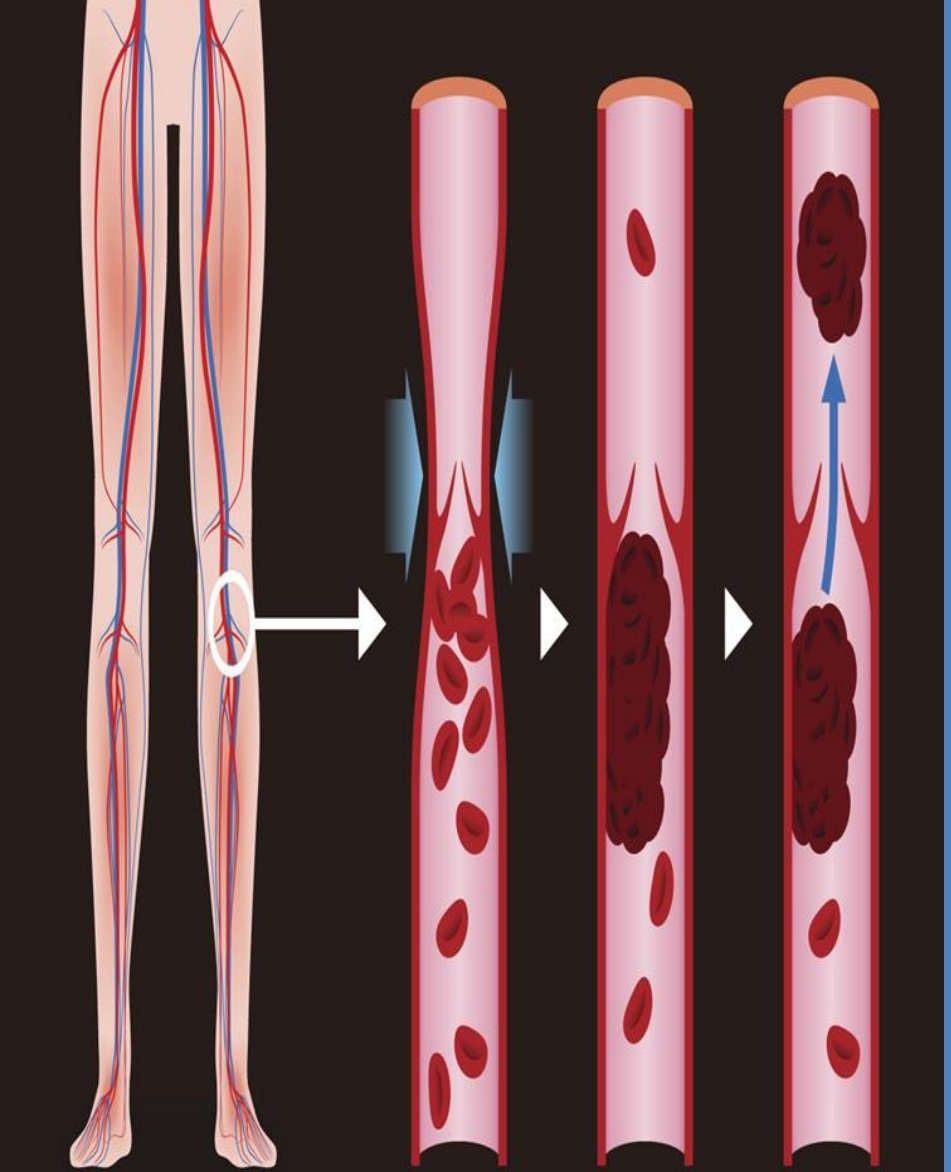
Chest drain

- General wellbeing.
- No respiratory distress.
- No air leak.
- Drainage <50 cc.
- Clear sero senguineous fluid.
- CXR- full expansion of lung.
- Non functioning drain tube.



Removal of abdominal drain

- No drainage or
- Drainage <25 ml/day.
- Serous or serosenguineous fluid.
- Non functioning drain.
- Anastomosis- usually up to 1 week.
- Can be shortened 2 cm /day allowing the site to heal gradually.



Every 1000 operations there will be –

100 DVTs,
10 pulmonary emboli and
1 death.

Complication-

- Pulmonary embolism.
- Varicosities.
- Non healing ulcers.
- Permanent edema of limb.

DVT Cuses

- Trauma to vessels.
- Hormones –Pregnancy,OCP.
- RTA
- Operations req. long time.,Oldage, Obesity.
- Malignancy.
- Blood disorder – Polycythemia
- Orthopedic surgery-Pelvic and Hip surgery.
- Serious Illness – MI , Stroke
- Immobilisation
- Splenectomy

Clinical Feature

Symptoms-

- Pain in calf,
- bleb in skin ,
- low grade fever

Sign-

- Homan,
- Moses

Investigation

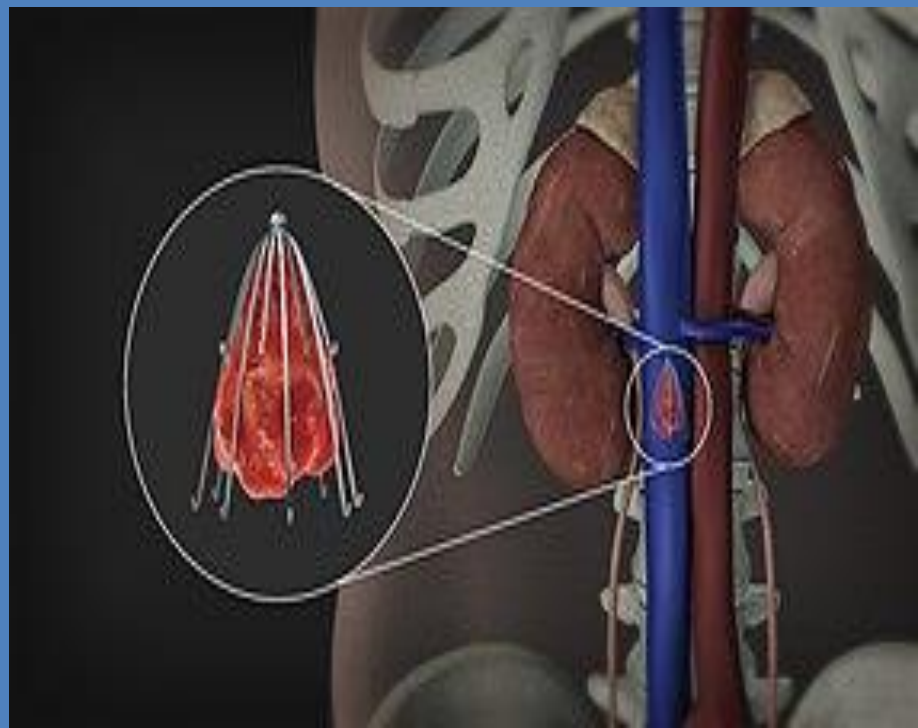
- Doppler study
- Contrast Venography

Prophylaxis

- Early mobilisation
- Hydration
- Heparin -5000 unit s/c 2hr. Before and 24 hr. after surgery and 12hrly for 5 days.
- Pneumatic compression.

Treatment

- Bed rest
- Elevation of limb
- Heparin -10000 unit I/V bolus with 30000 to 45000 unit /day. (INR 2-3) for 7-10 days
- Warfarin – 10mg 12 hrly for 6-12 months starting 2-3 days before heparin withdrawl.
- IVC filter
- Palma and May- Husni operations.



UTI

Nosocomial usually.

- Catheter,
- previous urinary contamination ,
- retention contribute to UTI.

Symptoms-

- Fever,
- dysuria,
- tenderness in flank.

Investigation-

- Urine R/M/E.

Treatment.

- Hydration,
- Antibiotic ,
- Drainage.

Thrombophlebitis

Factors-

- Cannula size,
- solution infused,
- bacterial presence,
- venous thrombosis .

Triad of phlebitis-

- Tenderness,
- Edema ,
- Induration.

Prevention

- Aseptic technique.
- Change tube every 2 days.
- Insertion site change every 3 days.
- Hypertonic solution to be given in larger veins.
- Use superior extremity veins .

Treatment

- Removal of cannula.
- Moist heat to improve circulation.
- Elevation of limb to improve venous return.
- Analgesics.

Wound infection

- Superficial surgical site infection.
- Deep surgical site infection.
- Organ space infection.

Wound infection

Major surgical infections-

- Significant quantity of pus.
- Delayed return to home
- Systemically ill.

Minor surgical infections-

- Discharge of small amount of pus or serous fluid only.

Risk Factor

Obesity

Hematoma

Diabetes mellitus

Steroid therapy

Immuno suppression

Malnutrition

Obstructive jaundice.

Sources-

- Clean surgeries – exogenous agent as S.aureus.
- GI surgeries – endogenous agent as E.coli.
- Colorectal surgeries – anaerobes.

Prophylaxis

- Identify patients at risk.
- Required in surgeries involving prosthesis .
- Hip replacement , vulvoplasties are the examples.
- Antibiotic are given peri - operatively.
- One dose is given preoperatively
- Two doses are given post operatively.
- One more dose if operation last more than 4hrs. Or soiling occurs.
- Mechanical bowel preparation.
- Shaving of operating area.

Management

- Open the wound--adequate drainage .
- Debridement & regular dressing.
- Antibiotic if septicemia or cellulitis.

Chronic wound infections may be due to-

- Possibility of specific organisms i.e. *Actinomyces.*
- Presence of a foreign body i.e. suture in the wound
- Associated fistula i.e. crohn's disease.
- Irradiation.
- Perineal wounds.

Management *(contd..)*:

Postoperative abscess

- Usually intraperitoneal.
- Can be found deep in the wound
- Localize the abscess and attempt drainage, if necessary under ultrasound or CT guided.
- Exclude anastomosis leakage as a cause.
- *Feature suggesting intra abdomina abscess-*

1. High temperature>39ºC.

2.No wound infection>5th P.O.D.

Treatment: Drainage under CT or USG if fail then Exploratory laparotomy.

Infection (Cont.)

Septicaemia & septic shock

- An infection may progress to septicaemia & shock in patients who are debilitated by disease or drug therapy.
- The problem is most likely to be encountered when diagnosis and localization of a septic focus is delayed, and initial treatment is inadequate.

Danger Signs

- Persistent and swinging pyrexia with tachycardia
- Tachypnea , glazed eyes , flushed warm skin
- Hypoxemia
- Oliguria<40ml/hr.

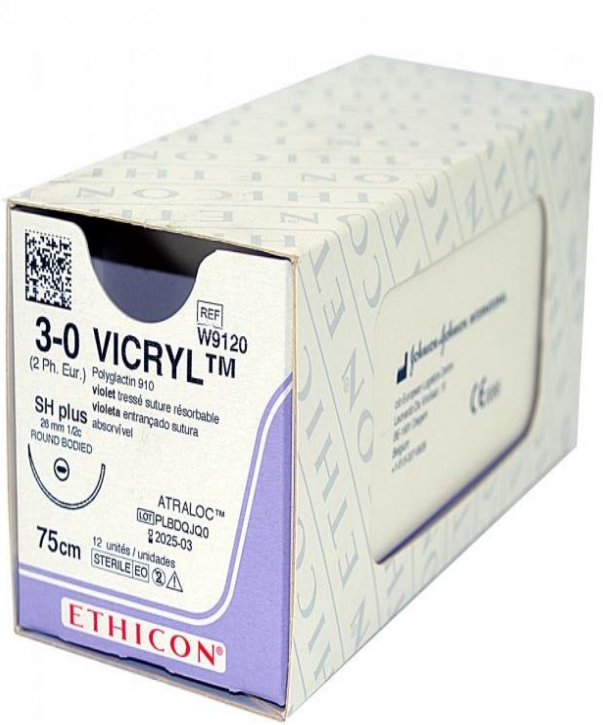
Septicaemia & septic shock (contd..)

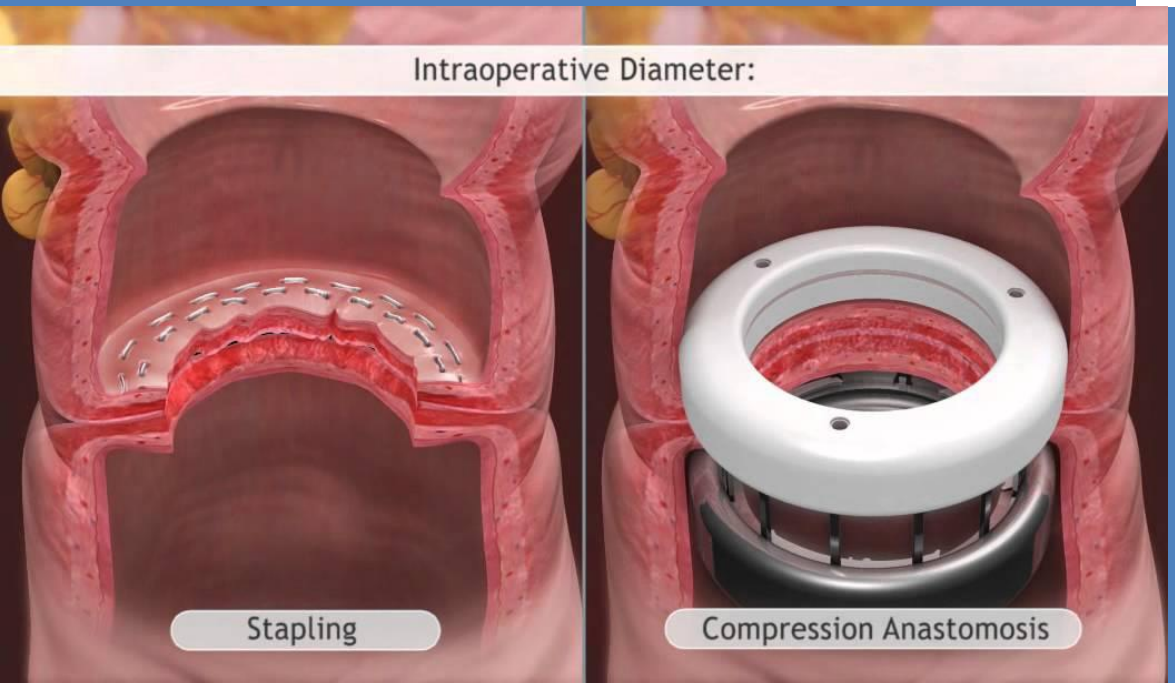
Principles of treatment are-

1. Ensure adequate circulating blood volume using a miuxture of crystalloids and colloids, aiming for a CVP of 10-15cm H_20.
2. Oxygen supplementation.
3. Broad spectrum intravenous antibiotics.
4. Ventilatory support if P_a0_2 is <75mmHg.
5. Cardiac support with drugs as dopamine, dobutamine, digitalis and catecholamines.
6. Attention to renal function with dialysis for established renal failure.
7. Early recognition and treatment of any evidence of multiple organ failure.

Anastomotic leakage

- Small intestine,
- Ileocolic &
- Ileorectal anastomosis- safe.





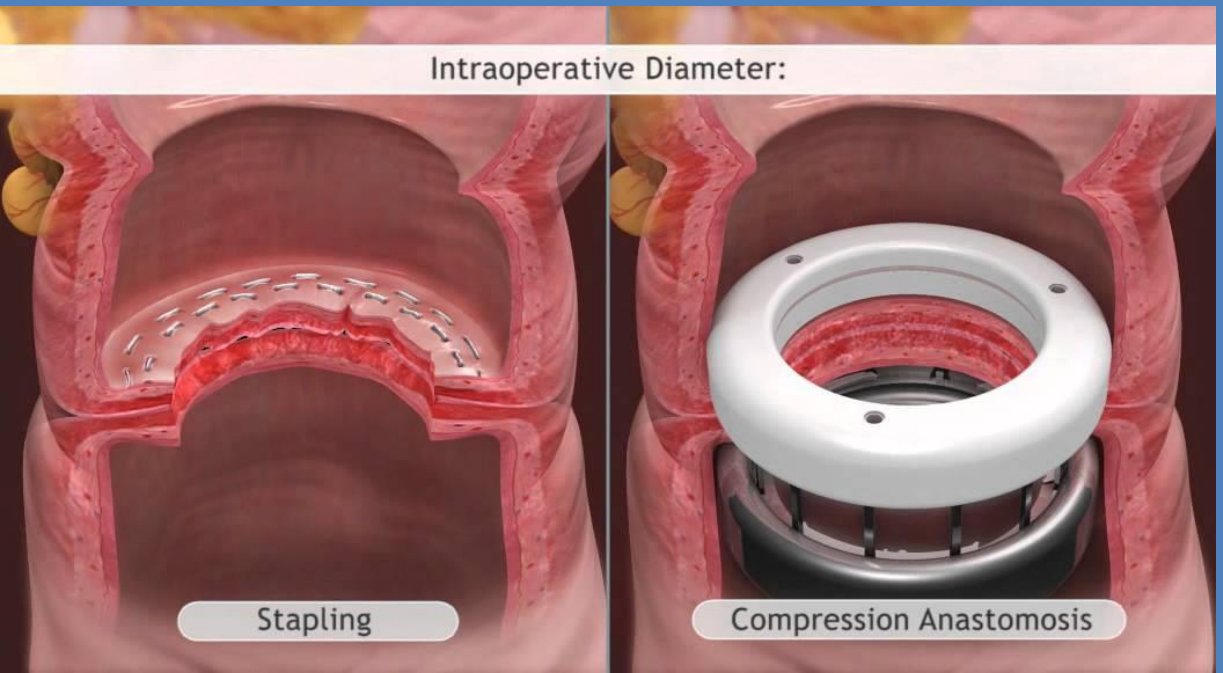
- Oesophageal,
- Pancreaticoenteric
- Colorectal anastomosis

-considered high risk.

Principles of anastomosis

- Good blood supply.
- Tension free anastomosis.
- Air tight & water tight.
- Anastomosis with healthy, non diseased bowel ends.

- 3-0 R/B vicryl.
- Single layer seromuscular extramucosal.
- Single layer full thickness.



Patency test.

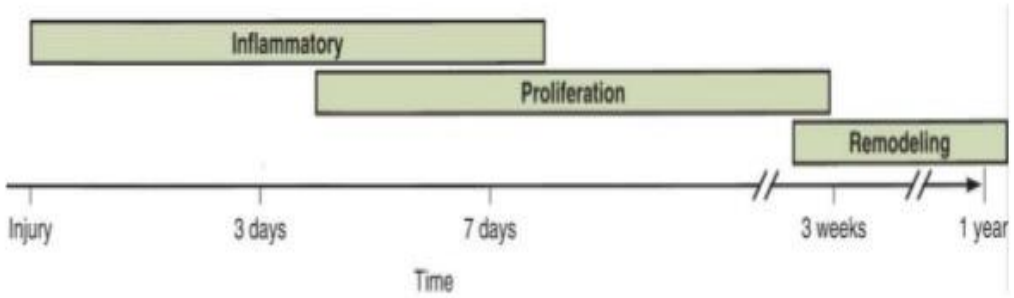
Leak test

Healing of anastomosis

- Inflammatory / Lag phase.
  - 0-4 days.
- Proliferative phase- Fibroplasia.
  - 3-14 days.
- Remodelling / maturation phase.
  - >10 days.

Intestinal healing

- Occurs like other tissues
- Hemostasis & Inflammatory phase
- Proliferative phase
- Remodelling & maturing phase



Anastomotic strength

- From collagen of submucosa.
- Low during the 1st POD.
- Early strength- on suture or stapler.
- Weakest- 3- 4th POD.

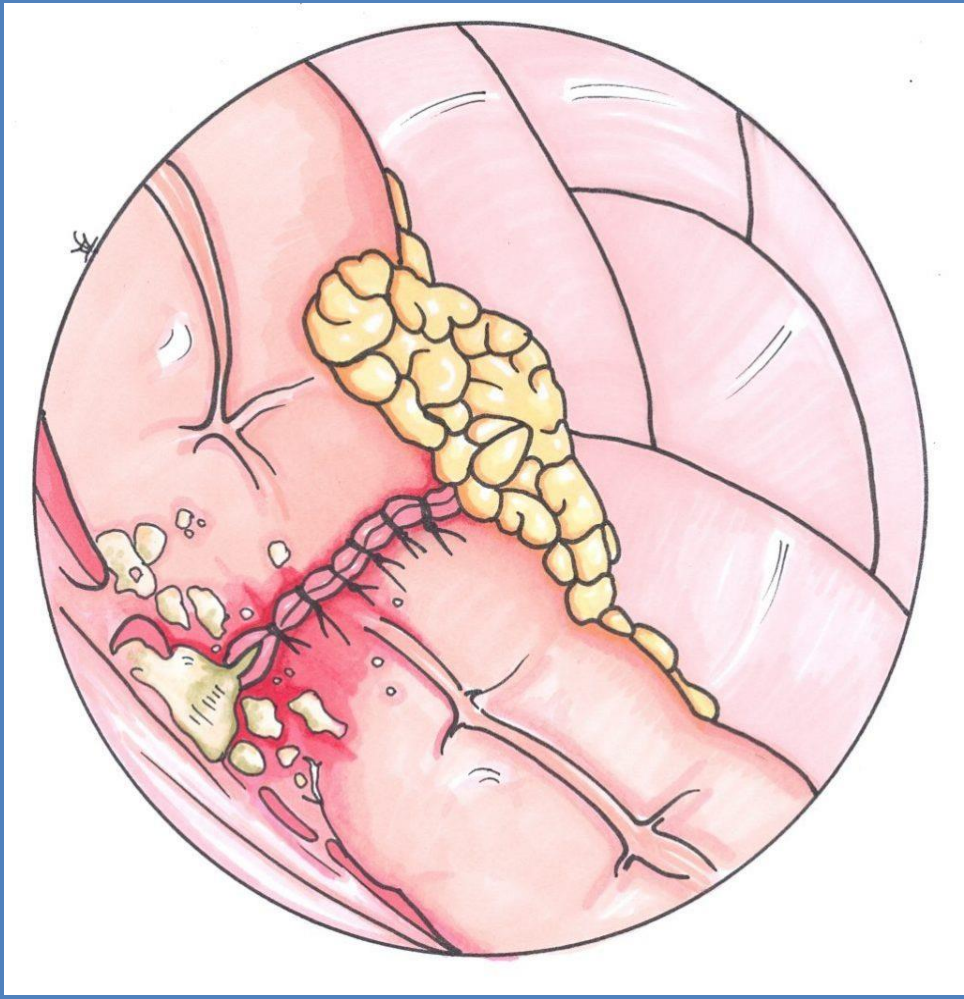
Anastomotic leakage

Presentation-

- GI contents may be identified in the wound or at a drain site.
- An intraabdominal abscess or more serious septic complication may develop.
- Prolonged ileus, unexplained fever or tachycardia, sudden collapse postoperatively or development of an internal fistula.
- Confirmation-
  - can be done by performing X-ray using contrast medium- Gastrograffin .

Grading of anastomotic leakage

- A- leakage with-
  - Minimal or
  - No clinical impairment.
  - Require no active intervention.
- Leakage require-
  - Active intervention.
  - But manageable without surgical intervention.
- Leakage require-
  - Repeat surgical intervention.
  - Often require diversion.



Surgery

- Thorough peritonial lavage with cefuroxime and warmed saline.
- Identification of leak.
- Resection of the area.
- Exteriorization.
- Rarely anastomosis.
- Re anastomosis is done after 3 months.

Fistulas

Management-

In the presence of a fistula management depends on the state of the patient and the fistula output.

When volume is small (<500ml/24hr) and the patient well, initial treatment is conservative(NPO,NG suction, I/V fluid, Antibiotic, Octreotide.)

If such treatment fails or the output is high (>500ml/24hr) or there is associated sepsis, intervention is necessary- surgery.

Thank You

www.Ferdauscolorectalcare.info