

Surgery

Susmit

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Deep Vein Thrombosis (DVT)

Formation of semisolid coagulum in a deep vein.

Virchow's triad

- Abnormal surface (endothelial damage)
- Abnormal flow (stasis / turbulence)
- Abnormal blood (thrombophilia)

Factors

- Immobility
 - Age
 - Obesity
 - Prolonged surgery
 - Pregnancy
 - Puerperium
 - Varicosity (effect of immobility, the rest are causes)
- Hormone-replacement therapy (high oestrogen)
- Previous DVT / PE
- Thrombophilia

Common sites

- Popliteal vein
- Femoral "
- Iliac "

Prevention

- Early mobilization
- Hydration
- Compression stockings
- Prophylactic LMW heparin
- Calf pumps
- Minimal use of tourniquets

CABG

Investigations for IHD

- ECG (first line)
- Cardiac enzymes (in acute coronary syndrome)
- Exercise tolerance test
- Echo: Evaluate
 - ventricular function
 - regional wall motion abnormalities
 - valvular lesions
- **Coronary angiography: gold std**
 - Extent, severity and location of stenoses
 - 70% reduction of diameter (i.e. >90% reduction of cross-sec) => severe

Indications for surgery

- 50% stenosis of the left coronary artery (“*left main stem*”)
- 50% stenosis of the proximal *LAD*
- 2/3 main coronary arteries diseased (*RCA*, *LAD*, *LCx*)

Graft selection

Types

- **Venous:** long saphenous vein
- **Arterial:**
 - LIMA most common (left internal mammary / left internal thoracic artery)
 - Others
 - * RIMA
 - * Radial
 - * Gastroepiploic
 - * Inf epigastric

Blood transfusion

Indications

- Acute blood loss
- Periop anaemia
- Symptomatic chronic anaemia

Complications

Single transfusion

- Haemolysis (haemolytic transfusion reaction)
- Fever (febrile transfusion reaction)
- Allergic reaction
- Infections
 - Hep B, C
 - HIV
 - Malaria
 - Bacterial inf
- Air embolism
- Thrombophlebitis
- TRALI

Massive transfusion

- Coagulopathy
- Hypothermia
- Hypo-Ca
- Hypo-K
- Hyper-K

Blood & blood products

- Whole blood
- Components
 - Packed red cells
 - FFP
 - * Plasma stored at -40 to -50°C
 - * Rich in *coagulation factors*
 - * 2y shelf-life
 - Cryoprecipitate
 - * Supernatant of FFP
 - * Rich in *factor VIII* and *fibrinogen*
 - * Stored at -30°C
 - * 2y shelf-life
 - Platelet concentrate
 - Prothrombin complex concentrate

Clinical factoids

- Target Hb level: 10g/dL
- 1 unit transfusion = 1g/dL improvement

Burns

Mechanism of fluid loss

Intense inflammation in burnt areas \rightarrow \uparrow permeability \rightarrow leakage of fluid into extravascular compartment

Assessment

- Rule of 9:
 - First approx
 - Adult
 - * Head-neck \rightarrow 9%
 - * Each upper limb \rightarrow 9%
 - * Torso front 18%
 - * Torso back 18%
 - * Each lower limb 18%
 - * Perineum 1%
- Lund and Browder chart
 - More accurate
- For smaller burns, a piece of paper about the size of the hand to measure the burnt area directly. Size of hand \approx 1%.

Fluid resuscitation

Indications

- **If $>10\%$ TBSA in children or $>15\%$ TBSA in adults (B&L)**
- To correct hypovolaemia
- " " electrolyte imbalance
- To prevent shock
- To provide nutrition

Principles

- **Parkland formula:** $4 \cdot W \cdot A$ mL fluid for the 1st 24h
 - Infuse $\frac{1}{2}$ over 8h, $\frac{1}{2}$ over 16h
- First 12h \rightarrow crystalloid only (massive fluid shift to extravascular compartment takes protein out with it)
- Then add colloid (human albumin solution)
 - Provides necessary oncotic pressure for keeping infused fluid within the vascular compartment

Definitive management

Superficial partial-thickness burns

- Regular dressing
- Heal spontaneously within 2 wks without scar irrespective of choice of dressing

Deep partial-thickness/full-thickness burns

- Nanocrystalline silver dressing until surgery (to prevent colonisation)
- Escharotomy for circumferential full-thickness burns
- Debridement + split-skin grafting
- Without surgery, heal by hypertrophic scarring

Nanocrystalline silver dressing

- 1% silver sulfadiazine
- 0.5% silver nitrate
- Mafenide nitrate
- Silver sulfadiazine + cerium nitrate

Grafts and Flaps

Graft

- Tissue transferred *without its original blood supply*
- Need to revascularise in recipient site

Types of skin graft

- Split-thickness skin graft: epidermis + part of dermis
- Full-thickness skin graft: epidermis + whole dermis
- Composite skin graft: skin + cartilage, skin + fat etc.

Flap

- Tissue transferred *with its original blood supply*

Causes of graft failure

- Inadequate vascularity of recipient site: due to
 - residual pus
 - residual exudate
 - residual dead tissue
- Haematoma
- Shearing forces
- Group A β -haemolytic streptococcal infection
 - can destroy grafts completely
 - hence, contraindication to grafting

Important anticancer drugs

- **Mitosis interferers**
 1. Vincristine
 2. Vinblastine
 3. Taxanes (e.g. Paclitaxel)
- **Antimetabolites** (i.e. DNA synthesis inhibitors)
 1. Methotrexate
 2. 5-FU
- **DNA damagers**
 1. Platinum drugs
 - Cisplatin
 - Carboplatin
 - Oxaloplatin
 2. Cyclophosphamide
 3. Bleomycin
 4. Doxorubicin
 5. Etoposide
- **Hormones**
 1. Tamoxifen: ER blocker (Breast ca)
 2. Goserelin: GnRH analogue; downregulate ant. pituitary → ↓ testosterone (Prostate ca)
 3. Flutamide: Androgen antagonist (Prostate ca)
 4. Bromocriptine: D2 agonist; blocks ant. pituitary stimul (Pituitary tumour)

Varicose veins

Management principles

- Avoid prolonged standing
- Compression stockings
- **Endothermal ablation**
 - *Laser ablation*
 - *Radiofrequency ablation*
- US-guided sclerotherapy
 - Sclerosing agent: sodium tetradecyl sulfate
- Open surgery
 - Sapheno-femoral junction (SFJ) ligation + great saphenous vein (GSV) stripping (*Trendelenburg operation*)

Deadly Dozen and ATLS

“Deadly dozen” of chest injury

Immediately life threatening

Manage in 1^o survey

- Airway obstruction
- Tension pneumo
- Open pneumo
- Massive haemothorax
- Flail chest
- Pericardial tamponade

Potentially life threatening

Manage in 2^o survey

- Tracheobronchial injury
- Oesophageal injury
- Aortic injury
- Myocardial contusion
- Pulmonary contusion
- Diaphragm rupture

Lung cancer

Types

- Non-small cell (NSCLC)
 - Squamous
 - Adeno
 - Large cell
 - Carcinoid
- Small cell (SCLC)

Features

- Cough (esp. changing cough)
- Dyspnoea
- Haemoptysis
- Wt loss
- Chest pain
- Clubbing
- Pancoast → compress sympathetic trunk → *Horner's*
 - Miosis
 - Enophthalmos
 - Anhidrosis
 - Partial ptosis
- Paraneoplastic features (SCLC)
 - SIADH
 - Cushing
 - Lambert-Eaton

Investigations

Diagnostic

- Chest X-ray
- Chest CT
- Sputum cytology
- Bronchoscopy + biopsy
- PET-CT

Staging

- USG whole abdomen
- X-ray skull
- Bone scintigraphy (aka isotope bone scan)
- Pleural fluid cytology (if effusion)

Treatment

- If NSCLC && within T3 N1 M0
 - Surgery: Choice depends on extent of pathology
 1. Segmentectomy
 2. Lobectomy
 3. Pneumonectomy
 - Chemo:
 1. Platins
 2. Gemcitabine
 - Radio
- Else (i.e. SCLC and > T3N1M0 NSCLC)
 - Palliative therapy
 - Surgery not helpful
 - Median survival: a few months

Low Back Pain (LBP)

Causes

- **Strenuous work**
- **Primary Back Pathologies**
 - *Spondylosis*: degenerative arthritis of the spine
 - *Spondylolisthesis*: forward slippage of vertebral body
 - *Spondylolysis*: defect in pars interarticularis without slippage
 - Lumbar *disc herniation*
 - *Spinal stenosis*: narrowed spinal canal → compression of spinal cord/nerve roots
 - *Fractures*
 - *Cauda equina syndrome*
 - * Compression of cauda equina nerve roots
 - * Most freq cause ⇒ lumbar disc protrusion at L4/5
 - *Scoliosis*
 - *Discitis*
- **Infections**
 - *Epidural abscess*
 - *Pott's disease*
- **Metastatic disease**
 - Sources:
 - * Thyroid
 - * Breast
 - * Lung
 - * Kidneys
 - * Prostate
- **Autoimmune conditions**
 - *Ankylosing spondylitis*

Investigations

- Plain X-rays
- CT: Best for assessing **bone anatomy**
- MRI: Detailed visualization of
 - Spinal cord
 - Meninges
 - Epidural space
 - Discs
 - Nerve roots
 - Bone marrow
- Bone scintigraphy
- DEXA (dual energy x-ray absorptiometry) scan: measure bone density
- Provocative discography
- Spinal biopsy