

# ANASTHESIA AND PAIN MANAGEMENT NUGGETS.....

- 1) Sevoflurane is the drug of choice from inhalation group for induction of anaesthesia whereas Propofol is DOC from i/v group
- 2) Succinylcholine is depolarizing skeletal muscle relaxant that is used for ETT intubation and it can cause HYPERKALEMIA and MALIGNANT HYPERTHERMIA. but the most common side effect of Succinylcholine is Muscle aches and pains.
- 3) I/V Atracurium is DOC for maintenance of anaesthesia for muscle relaxation.
- 4) For airway maintenance: Jaw thrust, Guedel airways, laryngeal mask, ETT, Tracheostomy
- 5) Laryngeal mask airway has got more risk of aspiration pneumonia as compared to ETT
- 6) The most reliable way to measure the correct placement of ETT after insertion is to check END TIDAL CO<sub>2</sub> concentration
- 7) If general anaesthesia has to be given urgently in emergency; use Sellick manoeuvre (rapid sequence induction) / cricoid compression to prevent aspiration
- 8) Halothane is Hepatotoxic
- 9) Most common used local anaesthetic is Lidocaine (Xylocaine)
- 10) Most potent local anaesthetic is Bupivacaine but it is also the most TOXIC and it causes CARDIOTOXICITY. so can't be used I/V ; only use intrathecal for spinal anaesthesia
- 11) The safest local anaesthetic is PRILOCAINE; hence it can be used for BIER'S BLOCK in upper limb. but Prilocaine can cause Methemoglobinemia. If BIER BLOCK is used in lower limb it is more toxic as compared to upper limb
- 12) Fentanyl and Remifentanyl are ultra short acting opioids used in TIVA
- 13) The highest step in WHO step ladder analgesia is REGIONAL BLOCK

# WOUND, ULCERS AND TISSUE REPAIR NUGGETS!!!

- 1) Tidy wounds = manage with primary closure
- 2) Untidy wounds : if <6 hours = convert to tidy and primary closure..... >6 hrs: delayed primary (tertiary closure)
- 3) Any wound on face can be managed by PRIMARY CLOSURE... b/c face has rich blood supply (imp mcq)
- 4) In any wound management; always adress ATLS protocol
- 5) In tidy wounds: repair all the damaged tissue and also suture the vessels.
- 6) Vessels are sutured by NYLON or PROLINE.
- 7) In all Bite wounds... give aerobic and anaerobic prophylaxis
- 8) Degloving injury is by crush / avulsion force in which skin and subcutaneous tissue gets strapped off and underlying tissue is exposed..... In management ; Do serial excision until u find viable tissue... then do SPLIT SKIN GRAFT
- 9) Pressure sores happen in 5% hospitalized patients.
- 10) Most common site of pressure sores is ISCHIUM
- 11) Vaccum assisted closure (VAC) is used in treatment of pressure sores or Diabetic ulcers.
- 12) Most common chronic wound is LEG ULCER.. and most common leg ulcer is VENOUS ULCER.
- 13) The main cause of venous leg ulcer is AMBULATORY VENOUS HYPERTENSION b/c of varicose veins
- 14) Bissgaard regimen is used for management of venous ulcers. (Elastic compression and leg elevation)
- 15) Compartment syndrome happens in blunt trauma .....leads to 6p b/c of arterial occlusion but the

most important feature is PAIN ON PASSIVE MOVEMENTS.....

16) If patient of compartment syndrome presents early: Do fasciotomy..... if late: do amputation of limb

17) Keloid is due to proliferation of immature fibroblastic tissue and it extends beyond the boundary of wound.

19) The most effective treatment of keloid is Surgical excision and Intralesional steroid.

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# PLASTIC SURGERY NUGGETS.....

- 1) The site from where Split thickness graft (thiersh graft) is taken; HEALS SPONTANEOUSLY.; used for large area by making meshwork from it and can be used in large leg wounds....it is NOT useful for cosmetic surgeries
- 2) Most common donor site of split thickness graft is THIGH but in children it is BUTTOCK.
- 3) Full thickness graft (wolfe graft) is used to cover small area; has better cosmetic outcome and is used to cover facial wounds.
- 4) Graft can only be applied to the area which has vascular supply intact because graft does not carries its own blood supply
- 5) Flap carries its own blood supply with it.
- 6) If flap has some KNOWN BLOOD VESSEL it is called AXIAL Flap.. if not known vessel = Random flap
- 7) To lengthen the minor scar and small flexion deformity = use Z-PLASTY
- 8) The most effective way to release scar and flexion deformity is V-Y plasty
- 9) Graft survival on recipient area in 1st 48 hours depend upon IMBIBATION to that area.
- 10) Flap may be muscle, bone, nerve, tendon.
- 11) Muscle flap (Lattismus dorsi) used for breast reconstruction
- 12) Bone flap also known as pedicle flap : best example FIBULA for Jaw reconstruction
- 13) Nerve flap: Sural nerve
- 14) Tendon flap: palmaris longus
- 15) The most common organism responsible for graft rejection on recipient area = STREPTOCOCCUS
- 16) Free flap can be taken from anywhere and it is not related to clearly defined artery (Random flap)
- 17) Free flap is taken from an area and is anastomosed on a receipient area with another vessel.

# SURGICAL INFECTIONS, SURGICAL SKILLS, STERILE PRECAUTIONS NUGGETS.

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- 1) The basic principle of abscess management is incision and drainage but the COLD abscess is managed only by ASPIRATION
- 2) Surgical incision site wounds are best managed by DELAYED PRIMARY CLOSURE
- 3) If a surgeon gets contaminated with HIV patient blood.....immediate post-exposure prophylaxis with anti-retroviral drugs started and continued for 1 month.
- 4) Cutting needles/hollow are used for skin and aponeurosis
- 5) Round body needles are used for laprotomy wounds, intestinal resection and anastomosis, blood vessel closure
- 6) Hollow / Cutting needles have got highest chance in spreading HIV transmission so use ROUND BODY NEEDLE if u r operating upon HIV+ patient
- 7) Vicryl suture has got EXCELLENT KNOT; so used for gut anastomosis.
- 8) Proline/propylene is a monofilament suture and is used in repair of VESSELS, hernia and abdominal wall b/c it has got EXCELLENT INTEGRITY of holding.
- 9) As a general rule= All vascular anastomosis should be done with NON-ABSORBABLE SUTURE (Proline)
- 10) During embolectomy; if femoral artery is cut by transverse incision = close it with proline in the direction of incision..... if femoral artery is cut by longitudinal incision=close it with vein patch
- 11) For the disinfection/sterilization of all the SCOPES (endo, cysto, broncho).....use either 2% Gluteraldehyde or Para-acetic acid.
- 12) For plastic: use Ethylene oxide for sterilization
- 13) If fine cutting scissor: Ethylene oxide or hot air oven for sterilization
- 14) If respiratory therapy instrument: Formaldehyde for disinfection
- 15) Thermometer and stethoscope: Alcohol

# ARTERIAL, VENOUS, LYMPHATICS

## NUGGETS.....

0) SYMPTOMS OF CHRONIC LIMB ISCHEMIA: Intermittent claudication, Rest pain, Gangrene, Non healing painful ulcers

1) Pain in calf caused by walking; relieved by rest; not present on taking 1st step with daily constant claudication distance = INTERMITTENT CLAUDICATION= best treatment is stop smoking... can be treated medical by CILOZTAZOL..... do not do surgery for it.

2) Pain in metatarsals; relieved by hanging legs; worse at night /leg elevation/legs horizontal = Rest pain...Surgery can be done

3) Normal Ankle brachial pressure index (ABPI) = 1

4) ABPI 0.5 - 0.9 = Intermittent claudication

5) ABPI <0.4 = Rest pain

6) ABPI <0.15 = Gangrene

7) All symptoms/ signs of CLI mentioned in 0 are the indications of SURGERY except CLAUDICATION.... means surgery is NEVER done for just Intermittent claudication...use CILOZTAZOL for it

8) Surgical options include BYPASS and LUMBUR SYMPATHECTOMY

9) For bypass of large vessels eg: AORTO-ILIAC BYPASS = use synthetic graft (DACRON)

10) For bypass in small vessel eg: FEMORO-POPLITEAL = use AUTOLOGOUS SEPHNOUS VEIN GRAFT

11) Whenever AIR EMBOLISM happens..... put the patient in Trendelenburg position (legs up; head down); give oxygen; left side down; needle aspiration of right ventricle

12) Burger disease/Thrombophelibitis obliterans affects small and medium sized arteries in YOUNG MALE SMOKERS; most common in LOWER LIMBS...gangrene of toes.....surgical treatment includes SYMPATHECTOMY/ARTERIAL RECONSTRUCTION/OMENTAL GRAFT.....Below knee amputation is last resort.

13) Raynaud disease affects small vessels in FEMALE NON SMOKERS; most common in UPPER LIMBS....fingers color changes (White-->Blue-->Red).; but peripehral pulses are not persistantly feeble.....treat with hand

warming/calcium channel blockers.... Sympathectomy

14) Burger disease also involves migratory superficial phlebitis; it also invades accompanying nerves, veins but FEMORAL/POPLITEAL pulses are palpable

15) In RAY amputation.... Metatarsal ki GARDAN kaatni ha

16) In transmeta-tarsal amputation.... Metatarsal ki BODY kaatni ha

17) In SYMES amputation..... bilkul ANKLE k uper kaatna ha.... but this amputation is not-suitable for prosthesis to fit.... so rarely done

18) In BELOW knee amputation.....12 cm below tibial tuberosity..... PROSTHESIS achi trah lg skty hain iss me....SO PREFERRED OVER SYMES.....

for example: If a patient sustains ankle injury and amputation is needed. surgeon says that tissue distal to malleoli must be removed.... best amputation would not be SYMES ; it would be BELOW KNEE b/c of better fixation of prosthesis after amputation

19) Most common cause of SUPERFICIAL THROMBOPHLEBITIS is IV BRANULLA

20) Pseudoarterial aneurysm is aneurysm of FEMORAL VEIN b/c of intravenous drug abusers in that area... and it is in differential diagnosis of inguinal swelling

21) Filaria damages the lymph nodes; not the lymphatic vessels

22) Endemic elephantiasis (podoconiosis) is caused by exposure to SILICA

23) Most common cause of chyluria is FILIARISIS...milky urine after fatty meal

24) 8000 ml of lymph is produced daily by a normal body

25) in Trendelenburg operation for varicose veins... FLUSH LIGATION of saphenofemoral junction is done and then stripping.

26) Investigation of choice for DVT is DUPLEX

27) Surgery for varicose veins is CONTRA-INDICATED in deep vein thrombosis

28) Congenital lymphedema happens <2years ; mostly bilateral; more common in males

29) Precox lymphedema happens 2-35 years of age; mostly unilateral; more common in females

30) Tarda lymphedema happens >35 years of age; related to obesity

31) Atherosclerosis of subclavian artery just proximal to the origin of vertebral artery leads to SUBCLAVIAN STEAL SYNDROME.; patient presents with dizziness vertigo arm claudication whenever he overuses arm.... confirm dx by

Arteriogram..... Do bypass/ ballon angioplasty/ endartectomy

32) For acute limb ischemia... give I/V heparin..... do embolectomy.... after embolectomy give HEPARIN and Merivan (warfarin) for 3-5 days

33) For DVT....If patient stable and no contraindication to anticoagulatnt... give Heparin 1-2 days.... then Warfarin +heparin for 5 days.. then only warfarin upto 6 MONTHS

34) for DVT if patient unstable and no contraindication to anticoagulatn.... 1st give THROMBOLYTIC (streptokinase/urokinase).... then same (heparin 1-2 days..warfarin+heparin 5 days.... only warfarin for 6 months)

35) In above both cases; if contraindication to anticoagulation..... do INFERIOR VANA CAVA FILTER..

36) Imp for above 3 points: for ACUTE LIMB ISCHEMIA = WARFARIN JUST FOR 5 DAYS..... but in DVT= WARFARIN for 6 months..

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# Surgical ANATOMY NUGGETS.....

- 1) Esophagus is 25cm long..... 4 constrictions point: i) 15cm from incisor at cricopharyngeous-c6 ii) 22.5cm from incisor when it is crossed by arch of aorta-t4 iii) 23.5cm where it is crossed by left main bronchus..... iv) esophageal hiatus at diaphragm 40cm from upper incisor-t10....
- 2) Esophagus just posterior to the left atrium in mediastinum..... so from here TRANS-ESOPHAGEAL ECHOCARDIOGRAPHY can be done
- 3) Foreign bodies are most likely to lodge in above mentioned constrictions
- 4) Lymphatics of esophagus are complexly around its adventitia.... so to determine the T and N (i.e. locoregional spread of tumor) ..... ENDOSCOPIC ULTRASOUND is very useful here.
- 5) if we do anastomosis after esophagectomy in thorax (i.e. Iver Lewis) = mediastinitis would take place.....so preferred method is to do anastomosis in cervical esophagus (Mckewon 3 stage esophagectomy)
- 6) In tracheo-esophageal fistula..... NG tube can not be passed more than 10cm from mouth
- 7) Esophageal hiatus is at t-10 and transmits i) Esophagus ii) Both vagus nerves iii) Left inferior phrenic arteries iv) Esophageal branches of left gastric artery
- 8) Intra-abdominal part of esophagus after esophageal hiatus is 2 cm
- 9) Stomach has complex lymphatics separated by water-shed line.  
D1: along lesser and greater curvature  
D2: Left gastric, splenic, common hepatic, retro-pancreatic  
D3: para-aortic, porta-hepatis, nodes behind head of pancreas
- 10) Liver is classified into two ANATOMICAL lobes by falciparum ligament but more important are its TWO FUNCTIONAL LOBES which are classified by an imaginary CANTILE LINE.
- 11) Caudate lobe = segment I..... all other segments in clockwise direction from left to right...
- 12) segmentectomy can be successfully done without damaging other part of liver
- 13) Middle hepatic vein is most prone to bleeding during operation on liver
- 14) When there is hepatic injury 4-p should be done: PUSH, PRINGLE, PACK, PLUG
- 15) Pringle manuevere is the clamping or compressing with finger on the free end of lesser omentum (foramen of Winslow) by compressing portal triad as it will stop bleeding.....it is also used to differentiate whether bleeding is from hepatic artery/portal vein --- or ---- from hepatic vein/inferior vena cava

16) Cystic duct is 3cm long. it joins with common hepatic duct and this joining makes TRIANGLE OF CALOT... cystic artery lies in this triangle and at the junction of CHD and cystic duct there is a lymph node (MASCANGI NODE/ LUND NODE) also called sentinal node of gall bladder..... carcinoma of g.b spreads from it.

17) In 15% of pepole.... Right hepatic artery makes a tortous course and comes in front of CYSTIC DUCT and forms what is called MOYNIHAN HUMP/ CATER PILLER TURN... it offers a great risk for bleeding during cholecystectomy

18) Thyroid weight is 25g.

19) Thyroidectomy: collar crease incision given 2 finger breath above sternal notch.....retract skin with joll's retractor.....subcutaneous tissue.....platysma.....vertical incision on deep fascia of strap muscles..... retract strap muscles with joll's retractor..... remove pre-tracheal fascia and expose and mobilize thyroid and tie the pedicles

20) Superior thyroid pedicle ..... ligate near the gland b/c it is in close relation with external laryngeal nerve away from gland..... remember SEN (Superior thyroid-External laryngeal-Near ligation)

21) Inferior thyroid artery.....ligate away from gland b/c it is in close relation with recurrent laryngeal nerve close to gland...

22) in continuation with point (19) ..... during thyroidectomy; strap muscles are just retracted...but if goiter is too large so that space is less.... strap muscles are cut/divided..... but remember.....THEY SHOULD BE DIVIDED ONLY IN UPPER PART...not in lower part b/c NERVE SUPPLY FROM ANSA CERVICALIS ENTERS THEM FROM LOWER PART and it could be damaged if we divide from below

23) 75% lymphatic of breast go to axillary lymph node esp anterior group and apical group..... 20% go along internal mammary nodes.... some also go to deltopectoral , diaphragmatic, sub-peritoneal, groin.

24) carcinoma of breast spreads by lymphatics but it can also spread via VENOUS SYSTEM communicating with VERTEBRAL VENOUS PLEXUS.....from where it can go to BRAIN...

# ATLAS PROTOCOL NUGGETS.....

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1) Primary survey: ABCDE

i) A: airway..... check verbal response; clear mouth with sucker; if GCS <8.....do definite airway (tracheostomy)

ii) B: breathing....give 100% oxygen; check immediately and manage for tension pneumothorax

iii) C: circulation..... check conscious level , pallor and pulse... (PULSE IS SUPERIOR TO ASSESS THAN BLOOD PRESSURE)

iv) Disability: do the glasgow coma scale and also exclude altered state of conscious b/c of drug/alcohol abuse

v) E: exposure

2) Resuscitation:

iv etc etc...analgesia etc

3) Radiographs: Lateral cervical spine, ap chest, ap pelvis

4) Secondary survey: use AMPLE technique (Allergy, Medication including tetanus, past medical history, Last meal, Events at the time of incident)

Now perform head to toe examination..... after checking each and every part..... DO LOG ROLL...(examine back of the patient)... 4 person required for it and spinal protection is very necessary

5) Re-evaluation

6) Definite management plan depends upon which part of body has got trauma

example: in abdominal trauma

i) If patient is hemodynamically unstable..... do FAST..... if not available..... do DPL

ii) If patient is hemodynamically stable..... do CECT

In our clinical practice..... patient is in shock with abdominal trauma and immediate the above investigations can't be immediately performed ..... so we do DAMAGE CONTROL RESUSCITATION.....1st giving immediately fluid challenge of 250-500ml within 10 mins

# TRAUMA NUGGETS.....

1) If diaphragmatic rupture..... 7 days: do laprotomy and trans-abdominal repair..... if >7 days= do trans-thoracic repair

2) For filial chest: If small= supplemental oxygen with adequate pain control (opoid or intercostal block).....also TAPE the whole chest to immobilize... give i/v fluids with caution b/c pul.edema can worsen...so COLLOID is prefferd over crystalloid.....

if large and transforming into respiratory failure= Place bilateral chest tube and start positive pressure ventilation for 3 weeks

3) Most common organ injured in blunt abdominal trauma is SPLEEN

4) In vascular truama

i) Proximal veins should be repaired whereas distal veins should be ligated. eg: if a patient has got trauma and popliteal vein is cut=do not repair it but ligate it immediately

ii) Femoral artery should always be repaired... if small cut: suture it..... if somewhat large cut: sephnous vein patch se close kro

5) as a rule In head injury = Blood pressure is increased b/c of CUSHING REFLEX..... if a person of head injury is hypotensive= always check other body parts b/c there may be ongoing hemorrhage elsewhere leading to this hypotension

6) Thoracotomy:

i) Operation room thoracotomy: done in hemothorax if on initial chest intubation >1500ml/hr blood comes or >200ml/hr over 3-4 hours

ii) Emergency room thoracotomy: done if patient is deteriorating eg in Cardiac temponade, for cardiac massage, immediate control of hemorrhage

iii) Planned thoracotomy