

Complications of CKD:

① Anemia

③ Malnutrition / Growth delay

② CKD-MBD

④ Amyloidosis

* Anemia ; usually in Stage 3 ≤ 60

• Types

- normo normo (CKD)
- micro hypo (IDA)
- mixed

• Causes:

1. $\downarrow$ Epo production

4. def Vit B₁₂ or Folate

2. UGIB

5. related to sys dz $\rightarrow$ Lupus

3. IDA

6. " " drugs $\rightarrow$ ACEI

• Correction;

1. exclude the cause of UGIB
2. Iron replacement
3. Epo

• Hgb target = 10-11,5 (11-12) amboss

WHY not $> 10-11,5$? due to Epo SE & allergy

1. $\uparrow$ Kalemia 2. HTN 3. Thrombosis in AVF 4. $\uparrow$

! iron $\rightarrow$ then Epo bc it works on iron stores

AV Examination

Inspection

- ① scar ② swelling ③ Arm elevation test

Scar → * transverse scar in Lt cubital fossa
3cm, [1m or 2m?] Intention,

Scar * kolloid or not.

* ass / with longitudinal torous swelling (15cm).

* Skin over hng is [hypo hyper pigmented

* there's multiple dimpling (needles)

* echomosis? pub? aneurysm?

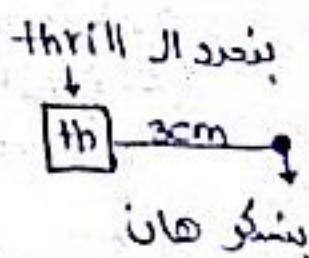
test * to determine if there's outflow obstruction.
له لوما في obs اول يصير collapse of swelling

Palpation

- Soft or not
- Compressable or not
- pulsating or not
- thrill or not
- auscultation test →

يزيد النبض

ثقل / يفتقر الـ thrill . لوما في obs →



Auscultation

Continuous
Soft low
machinery
murmur

* CKD - Mineral Bone Disorder;

• def : ab in mineralization $\pm$ bone metabolism

• pathophysiology: **HYPOCALCEMIA** **+ $\uparrow$ PO₄**

① $\downarrow$ PO₄ ex - $\uparrow$ PO₄ in Blood = Ca PO₄ in tissue = $\downarrow$ Ca

② $\downarrow$ Vit D hydroxylation = $\downarrow$ Ca GI absorp.

↳ chronic $\downarrow$ Ca = 2ry hyperparathyroid $\rightarrow$ 3ry

• Histology:

① 2ry $\uparrow$ para = $\uparrow$ turnover or OFC

② Osteomalacia ($\downarrow$ mineral)

③ mixed uremic bone dis = 1+2.

④ Adynamic " " = $\downarrow$ bone formation w/out malacia

• C/P: - asym

- MSS: Fracture, bone pain, muscular weak & pain

- extra: $\left\{ \begin{array}{l} \text{Focal Vascular Calcification} \\ \text{diffuse " " " "} \end{array} \right.$

• ttt: **(3D)** $\rightarrow$ Diet / Drugs / Dialysis

for $\uparrow$ PO₄ $\rightarrow$ $\downarrow$ PO₄ diet + PO₄ binder - (non Ca containing) (Sevelamer)

for $\uparrow$ para $\rightarrow$ Chole Calciferol ($\approx$ D3) Ca Containing

$\rightarrow$ Cinacalcet (exp + $\uparrow$ SE)

$\rightarrow$ Total Parathyroidectomy $\pm$ reimplantation

* Complications of hemodialysis

AVF Comp %

Local: infection, stenosis, aneurysm, thrombosis

Sys: Steal Syndrome and { HF (↑COP & ↓ resistance)
[Pul HTN.

if ↑ Blood Flow in AVF

= shunted away from distal structures

= painful ischemia of hand & fingers

= seen during [dialysis] [cold weather]

= C/P : Numbness, Parasthesia, discoloration.

② Hypotension → over filtration or Anti HTN drugs

3 Bleeding $\rightarrow$ Plt dysfunction

→ C/P: ~~vomiting~~ nausea
Coma
Confusion
Seizures

4) Dialysis Disequilibrium \$ in pt start for FIRST time

- due to rapid extraction of substances = cerebral edema

- +++ : ↓ duration + ↓ Ultra + ↓ Pump Power
(2 instead of 4h) filtration

5 Water Hard Syndrome → problem of water supply

CLP: nausea
vomiting

weakness
HTN

Thrombosis

6 CVD: Mcc of death in CKD pt w/dialysis
Chest pain / angina

7 Gil upset

- mesenteric ischemia

- GI Bleeding (Plt dys) [Bleeding Tendency]

- ↳ Constipation & paralytic ileus (uremia)

[8] Air Embolism → from devices.

Renal Replacement Therapy :

- op $\rightarrow$ Kidney transplant
- non-op $\rightarrow$ hemodialysis
 $\rightarrow$ peritoneal dialysis

Peritoneal dialysis

- * for adherent pt, using peritoneal memb itself as semi ~~permeable~~ permeable memb, done at home.
- * Complications: Infection (peritonitis) + metabolic disturb

Hemo Dialysis

- * either by $\left\{ \begin{array}{l} \text{venous Catheter} \rightarrow \text{Short term} \\ \text{AV Fistula} \rightarrow \text{long term} \end{array} \right.$

* maximum Ultrafiltration = ~~10~~ **10-13** ml/kg/hr

* **AV Fistula** : Connection / Anastomosis b/n Artery & Vein

- Site : RadioCephalic (Cimino Fistula) $\left[\begin{array}{l} \text{on} \\ \text{non-} \\ \text{dominant} \\ \text{hand} \end{array} \right]$
BrachioCephalic $\rightarrow$ trans. scar
BrachioBasilic $\rightarrow$ medial long. scar

• 6/6/6 :

• signs of maturation : **Rule of 6**

- ① 6 Weeks $\approx$ 40 days
- ② diameter $\geq$ 6mm
- ③ depth $<$ 6mm
- ④ Blood flow $>$ 600 ml/min
- ⑤ length $>$ 6 cm

