

إذا كان هناك تورم في "edema" لا wait 20 sec.

behind medial malleoli. إذا كان فيه تورم ينتفخ لثوانٍ لا level of edema.

* Kidney: pitting edema + puffiness of eyes.

* Heart: " " + pulmonary congestion

* Liver: " " + stigmata of liver dis.

* Sites of central line:

- ① internal jugular
- ② subclavian
- ③ Femoral.

* Complication of central line:

① infection.

② iatrogenic pneumothorax

③ infective endocarditis

④ dyskiasis

Fever, line block, end stage غير ال

* infected line till break otherwise

examination of volume status in pt with ESRF

- ① eye: bulgy eye - sunken eye in children more.
- ② mouth: dry mouth.
- ③ neck: Congested neck = raised JVP
- ④ heart: pericardial effusion = muffled heart sound
- ⑤ back: pleural effusion = stony dullness + decreased breath sounds
or Pulmonary edema = crepitation
- ⑥ abdomen: ① distended abdomen ② umbilicus = everted inward
③ percussion = shifting dullness ④ ed pitting
abdominal wall edema = by bell & stethoscope.
see (20-15) ed signs & umbilicus line
- ⑦ Sacral edema
- ⑧ LL → lower limb edema = unilateral - bilateral

* A-V Fistula

anastomosis b/w artery - vein - continuous circle.

"From heart to heart"

maturation → 4-6 weeks

* non dominant hand

site of Fistula:

- ① to radio cephalic
- ② brachio cephalic
- ③ brachio basilic

* Inspection:

Scar: transverse scar in Lt cubital Fossa • 3 cm

primary intension - " Colloid or not " associated

with longitudinal torous swelling 15 cm

Skin over line • multiple dimpling " needle insertion

echymosis - pus - aneurysm

Skin • shiny - hypopigmented - hyperpigmented.

* arm elevation test:

الطبيب يرفع ذراع المريض - الطبيب A-V - تفحص وتفحص
عند رفع الذراع
outflow obstruction.

normal • Collapsed by arm elevation.

Pulsation :-

- ① soft or not
- ② compressable or not
- ③ pulsating or not
- ④ thrill or not
- ⑤ augmentation test.

المفرق والناطقة اليد في Pulsation ← بضع فؤاد ال swelling
 في ← المفرق ال اليد Pulsation ← no inflow obstruction
 في ← المفرق ال اليد Pulsation ← "inflow obstruction"

* Auscultation :-

Continuous soft low mechanical murmur.

* Final diagnosis :- End stage renal dzs with hemodialysis
 by Lt brachiocephalic fistula

* Complication:

local: ① aneurysm ② rupture aneurysm ③ obstruction.
 ④ infection ⑤ ~~distal~~ ischemia = distal ischemia

* ~~Distal~~ distal ischemia * ↓ BF to hand * Cold - Parathesia - discoloration

④ systemic: High cardiac output HF ② pulmonary HTN * steal

* How to do dialysis

① brachio cephalic: transverse

② brachio basilic —•• medially • longitudinal •

* (10 - 13) ml/kg on 1 hr " maximal ultra Filtration

* steal syndrome in hemodialysis

* Coolness - Pallor - mild paresthesia - pain during dialysis -
• pain at rest - Paralysis - ulceration - Tissue necrosis - loss of one or more Finger

* AV fistula < 30% EF, HF are contraindications for
Fistula

examination of end stage Renal dz with hemodialysis

① eye: bulgy eyes - pallor - Xanthasma - hyperlipidemia From nephrotic syndrome

diarrhy sclera " " " " " " " " " "

* early look of Face " " " " " " " " " "

* 2nd, 3rd hyperparathyroidism → prominent zygomatic bone

* swelling of parotid gland → elevation of " " " " " "

ear prona

* uremic Frost " " " " " " " " " "

* mouth:

① dry mouth ② uremic odor ③ discoloration of teeth

④ gum bleeding ⑤ low hygiene

* abdomen

① distended abdomen

② hair loss

③ purpura-echymosis = platelet dysfunction - normal platelet count

④ scars → nephrectomy

⑤

⑤ scaly skin → mineral bone disorder due to hypocalcemia - hyperphosphatemia

⑥ scratch: itching mark.

① hyperphosphatemia

② 2nd / 3rd hyperparathyroidism

③ uremia

⑦ umbilicus = everted - inverted

Palpation:

= polycystic kidney =

- hepatosplenomegaly due to 2nd amyloidosis

auscultation:

renal artery stenosis → bruit.

Hands:

Signs: leuconychia or "half-half nails"

* Cyanosis

* scaly skin, dry skin

* interossei muscle.

* xanthosoma.

* Pallor

* atrophy in thenar-hypothenar muscle

* Fine tremor.

* LL

(A) lower limb edema.

(B) scaly skin.

(C) color = ecchymosis - cellulitis

(D) Fungal infection

(E) deformity in toes

(F) tenderness in calf muscle.

scratch marks.

* الفيل - علامات (٢-٤) آلام بالأسبوع

* Most common organism → caused infected line is
Staph aureus.

(1.5 X baseline)

* Definition of AKI :

- ① serum creatinin > 0.3 baseline "during 2 days"
- ② serum creatinin > 1.5 baseline "during 7 days"
- ③ urine output < 0.5 ml/kg/hr → "during 6 hrs"

nephrotic syndrome → ↑ kidney Fx by
thrombosis

Acute kidney I with hepatic Patient "liver cirrhosis"

① prerenal ② renal ③ post renal

① ascites → abdominal Compartment syndrome.

renal "hypoperfusion + nephrotic syndrome ↑ k Fx"

② drug induced : diuretics - aldactone "overdose"

③ NSAIDs → acute interstitial nephritis

- ④ Hepatitis C related to GN
- Ⓐ membranoproliferative Ⓑ membranous Ⓒ post infectious.
 - Ⓓ mixed cryoglobulinemia Ⓔ FSGN

⑤ hepatorenal Syndrome

Ⓐ ~~cat~~ chronic liver dz = ascites + jaundice

Ⓑ serum creatinine > 1.5

Ⓒ No improvement of kidney function after diuretic withdrawal and give "serum albumin."

Ⓓ No UGIB

Ⓔ No nephrotic drugs

Ⓕ No structural anomalies in u/s

Ⓖ proteinuria No more than $0.5g < 500mg < 0.5g$

"No nephrotic syndrome"

* gold standard for hepatorenal = liver transplantation

Bridge therapy → قَصْرٌ لِدَلَةِ الْكَلْبِ

AKI due to HF

- ① pre renal ② renal ③ post renal

- ascites → abdominal compartment syndrome
- overdose & diuretics
- PCI → Contrast ٠ موالد-٠
- NSAIDs → acute interstitial nephritis
- Cardio renal syndrome

~~AKI~~ Acute HF —→ AKI

CHF —→ cKF

AKI —→ Acute HF

CKF —→ chronic HF

Systemic dzs = إنتان الـ Sepsis

AKI due to pregnancy or post delivery

- ① bleeding post partum → hypoperfusion
- ② Cortical necrosis
- ③ Pre eclampsia
- ④ TMA = thrombotic microangiopathy → diagnosed by blood film → schistocyte

- 5] HEP - elevated liver enzymes
- 6] Fatty liver & pregnancy.
- 7] Acute interstitial nephritis From drugs
- 8] systemic dz. - SLE
- 9] infection.

ما هي الاسباب التي قد تؤدي الى AKI؟

- 1] Drugs.
- 2] Contrast, CI,
- 3] herpex " Acute interstitial Fibrosis or chronic

Dose of NSAIDs - that make AKI

"non independent" = Non dose dependant

Hx & hematuria → red discoloration in urine micro → ?-5 REC

① UTI = urinary symptoms.

② Fever → upper respiratory tract infection

post infections or IgA nephropathy.
 بعد 3 أسابيع بعد 3 أيام

③ skin infections.

④ transient hematuria = exercise - meniscus, acute viral illness.

⑤ trauma

⑥ deafness → Alport syndrome.

⑦ polycystic kidney

⑧ idiopathic = غير متوقعة

⑨ systemic dzs = "SLE"

⑩ nephrotic / nephritic

⑪ Coagulation disorders.

Drug Hx

- cocaine

Rifampicin

renal dx

Family Hx

- Alport syndrome

- polycystic

* uremic pericarditis → ① Friction rub
② ST elevation except AVR

* Tumor lysis syndrome → AKI → Ca^{2+} ↓
chemotherapy

- ① hypocalcemia
- ② hyperkalemia Ca^{2+} ↓
- ③ hyperuricemia
- ④ hyperphosphatemia
- ⑤ oncotic

↑ Ca^{2+} ↓ K^{+} ↓ Uric acid ↓ PO_4^{3-}

TTT 2: Supportive therapy.

chronic renal Failure ٢٠

- ↳ irreversible + persistent elevation in kidney function > 3 months
- E GFR > 60 with kidney damage $\rightarrow \geq 3$ months
- E GFR < 60 with or without kidney damage > 3 months

↳ kidney damage - ٢٠

- ① persistent proteinuria, hematuria
- ② structural damage on ult " Small size kidney - PKK
- ③ biopsy $\rightarrow$ Fibrosis

staging of CKD

- ① ~~740~~ GFR > 90 with kidney damage
- ② GFR = 60 - 89 " " " "
- ③ a) 58 - 45 with or without
- b) 30 - 44 " " "
- ④ GFR = 30 - 15
- ⑤ GFR < 15

most Common Causes of ESKD %

- ① Diabetes
- ② HTN
- ③ GN
- ④ Connective tissue dz.
- ⑤ = tubular - glomerular - interstitial - vascular dz in kidney
- ⑥ Polycystic kidney dz.

* screening for diabetes nephropathy

- ① albumin - creatinine ratio **ACR**

albuminuria نسبة في الدم

staging of diabetes nephropathy :-

- ① hyperfiltration in kidney
- ② silent = histopathological change
- ③ microalbuminuria
- ④ overt proteinuria
- ⑤ advanced glomerulosclerosis

Histopathological change in Diabetic nephropathy:

- ① neutrophil infiltration
- ② mesangial hypercellularity
- ③ Kimmelstiel Wilson nodule = eosinophilic nodule
- ④ advanced sclerosis

* CKD with normal or large size in kidney:

- ① multiple myeloma
- ② polycystic kidney
- ③ HIV
- ④ Amyloidosis
- ⑤ Diabetic nephropathy
- ⑥ Tumor
- ⑦ scleroderma
- ⑧ hydronephrosis

Delay Progression of Diabetic nephropathy

- ① Non pharmacological : Diet = low salt, low protein

* wt loss in obese pts - stop smoking

avoid NSAIDs - Avoid nephrotoxic drugs

avoid any contrast

- ② pharmacological :- ACEI → anti fibrotic
anti proteinuria effect

How: vasodilation in efferent arterioles.
intra glomerular pressure. $\uparrow$ glomerular pressure.

don't fill with K Fx until bill is $\leftarrow$ ACE I above 7
 Follow up $\rightarrow$ after 3 days or 1 week $\rightarrow$
Stop $\leftarrow$ 25% no fill above K Fx $\uparrow$ $\rightarrow$ check
 monitoring K^+ level daily

② due to lipid profile → statin

③ Aspirin baby

(iv) $\pm$ diuretics due to volume status.

CKD is ir metformin is not indicated
due to GFR

① $GFR > 45 \rightarrow$ safe

② GFR '30-45" - adjustment.

③ $GFR < 30 \Rightarrow \text{stop}$

Diabetic nephropathy → little to no proteinuria → CKD → Follow up done

- ① kidney Fx
- ② urine analysis
- ③ Control BP
- ④ Control DM
- ⑤ non pharmacological + pharmacological
- ⑥ $GFR < 30$ → "hemodialysis - transplantation"

"renal replacement therapy"

Complication of CKD

- ① anemia → Stage 3 $EGFR < 60$
- ② CKD-HBD "mineral bone disorder"

Types of anemia

- ① normocytic normochromic "anemia of chronic dis"
- ② microcytic anemia → "iron defi"
- ③ mixed

most common cause of Anemia in CKD

① erythropoietin deficiency

② iron deficiency anemia

③ UGIB

④ B12 - Folate

⑤ anemia related to systemic dzs : SLE

⑥ anemia due to drugs : ACEI

* Correction of anemia:

① exclude the cause of UGIB

② iron studies

③ give erythropoietin

target level of hemoglobin in CKD + hemodialysis

* 10-11.5

لأنه من آثاره

Because of side effect of EPO

① hyperkalemia ② HTN ③ thrombosis in fistula

CKD MBD →

ليس بهر ؟

Vitamin D activation → 1) active Vitamin D

2) hydroxylase enzyme def. → kidney

• hypocalcemia, hyperphosphatemia → بالتالي بهر عند المريض

(2, 3) hyperparathyroidism → وبالتالي بهر عند

what is the CKD MBD

① secondary or 3rd hyperparathyroidism

② osteoporosis - osteomalacia

③ A dynamic bone dis → Pathological Fracture
التي خلقة بتكمو

* Control of CKD MBD

3D:

① Diet → (الحمية) - (البروتين) - (الكالسيوم) - (الفوسفور) → منع

② Drug

③ Dialysis → an adequate dialysis

dialysis

في

كثيرة

كيف عرف انه رفض بديل كبد؟

clinical: no Cachexia, no edema

Volume status good

No GI, Cardiac - chest symptoms

lab → electrolytes - ABG - kidney Fx → good
albumin level →

المسألة ESKD، صمغ الـ albumin واط - mortality

نسبة urea reduction ration في بديل كبد

> 65% → an adequate dialysis

< 65% → ما بين كبد

علامات كبدية في بديل كبد:

العلامات التي أهم طبة بديل والدة في كل طبة

في ذلك في بديل كبد line وحاد على infection أو

Drugs used in CKD MBD:

① phosphate binder

* Ca^{+2} containing $\rightarrow$ * as Ca^{+2} replacement + phosphate binder

* Non Ca^{+2} containing

* sevelamer $\rightarrow$ if Ca^{+2} high or calcification
* aortic valve or Cardiac calcification

② Calcitriol * α dihydroxyl αP_2
 $\downarrow$ PTH

③ Cinacalcet $\rightarrow$ * expensive + GI upset

④ Total Parathyroidectomy + reimplantation

بشكل جزئي أو SCM أو اليد

criteria for diagnosing polycystic kidney.

- ① < 30 years → 2 cysts either in one kidney or two
- ② 30 - 59 → 3 cysts in each kidney at least
- ③ > 60 years → 4 cysts " " "

Complication of polycystic

- ① renal ② extrarenal

* renal → ① CKD ② stones ③ infection in cyst
hemorrhage

* extrarenal: ① HTN ② perianeurysm → hemorrhagic CVA

③ in heart: mitral valve prolapse + aortic-mitral regurgitation

④ extrarenal cyst: in pancreas - splenic - liver.

⑤ in GIT → diverticulosis

in CBC → hemoglobin → ↑ = polycythemia →

↑ erythropoietin الكمية كبيرة تفرز

* advise to correct Polycystic

① Control HTN → ACE I

② loss of protein, loss of diet

③ increase fluid intake due to High risk of infection and renal stones.

④ Follow up every 6 months

⑤ UA = Urine Analysis

* Polycystic Kidney Disease (PKD) is a genetic condition

* autosomal dominant

* age related

① < 30 → u/s if there is no PKD → next step

CT " " → genetic study

② 30 - 39 → u/s if there is no PKD → next step

CT " " → genetic study

③ > 40 years u/s if there is no PKD → next step

④

PCK → autosomal dominant type 1 → 16 chromosomes
 " " " type 2 → 4 chromosomes

Acute Complication of hemodialysis :-

① hypotension → over ultra filtration

→ Anti HTN drugs

في أثناء الترشيح إذا حدث انخفاض في الضغط أثناء الترشيح فيجب إيقاف الترشيح

في النوبة الثانية إذا كان المريض يعاني من انخفاض في الضغط فيجب إيقاف الترشيح

في النوبة الثالثة إذا كان المريض يعاني من انخفاض في الضغط فيجب إيقاف الترشيح

في النوبة الرابعة إذا كان المريض يعاني من انخفاض في الضغط فيجب إيقاف الترشيح

في النوبة الخامسة إذا كان المريض يعاني من انخفاض في الضغط فيجب إيقاف الترشيح

dopamine

② dialysis equilibrium syndrome.

syncope - Confusion - nausea → إذا حدث ذلك فيجب إيقاف الترشيح

Seizure - Coma → إذا حدث ذلك فيجب إيقاف الترشيح

إذا حدث ذلك فيجب إيقاف الترشيح

③ Pump → 200 - 250 ml/min

[3] water = Hard water syndrome:

= Nausea - Vomiting - weakness - HTN, Fistula thrombosis

مشكلة في إمداد الماء في الفيلد تشتر
water supply unit problem

الماء الذي يطبق به الغلات للريفا غير متعلية

[4] Cardiovascular det. chest pain - angina

→ its the most common cause of death in CKD with hemodialysis

[5] GI upset = mesenteric ischemia - paralytic ileus
constipation

[6] bleeding tendency → platelet dysfunction

[7] itching → الحكة

[8] endocrine dysfunction → Hormonal imbalance

[9] Complication due to A-V Fistula

[10] air embolism

longstanding or chronic complication

① anemia

② CKD HBD

③ malnutrition

④ amyloidosis → B₂ microglobulin accumulation.

high reflect. low dialysis clearance

amyloidosis → abnormal protein deposition in tissue

Types:

① AL → multiple myeloma.

② AA → connective tissue dis. RA, cystic Fibrosis
Secondary FHF.

③ dialysis related amyloidosis

Amyloidosis is seen in nephrotic syndrome RA, liver failure

How to differentiate b/w GN hematuria or Non GN

- ① proteinuria
- ② dysmorphic RBC
- ③ RBC Cast.

persistant hematuria $\rightarrow$ neurologic
GN

* IgA nephropathy $\rightarrow$ Complement C3 Normal
* post infectious GN $\rightarrow$ " low

* Celiac dzs with hematuria $\rightarrow$ associated with
IgA nephropathy. ② + Alcoholic