

What could be causing her peripheral oedema?

1. ↓Oncotic pressure (low serum albumin)

fluid seeps out of vessels when there is inadequate circulating protein to exert oncotic pressure to hold it in vessels

- Proteinuria
- Malnutrition or malabsorption
- Liver failure

2. ↑ Hydrostatic pressure

Increased hydrostatic pressure drives fluid out of vessels and into interstium

- *Right heart failure*
- *Portal hypertension*
- *Venous obstruction*

What Investigations should be ordered?

- Check Renal Function (always in someone with HTN) → Cr 122, eGFR 50
- CXR → Bibasal effusions R>L
- Quantify Serum Albumin, Formal MSU → albumin 22, MSU NAD
- Quantify Proteinuria
 - uACR → 420 mg/mmol
- Pregnancy Test
 - Needs to be excluded in any young woman presenting with hypertension

What Syndrome does she have?

Oedema

Proteinuria >3g/day

Low serum Albumin

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graph TD; A[Oedema] --> D[NEPHROTIC SYNDROME]; B[Proteinuria >3g/day] --> D; C[Low serum Albumin] --> D;
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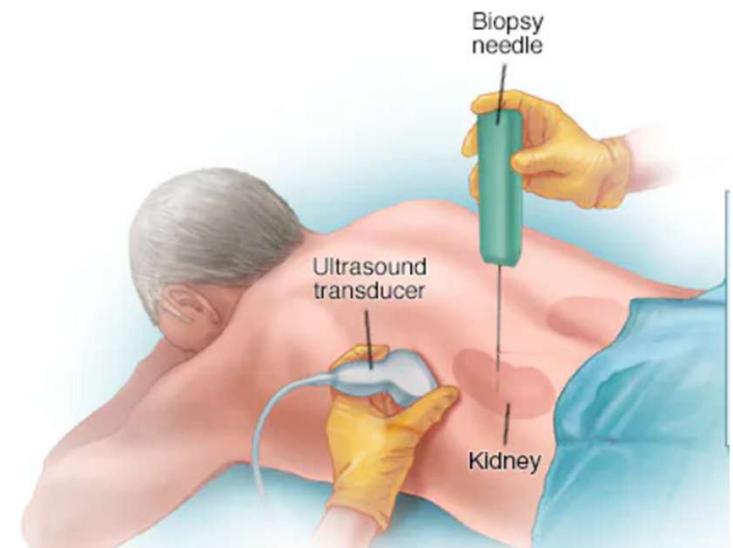
NEPHROTIC SYNDROME

What conditions could be causing Nephrotic Syndrome in Clara?

- What screening labs could you order?
 - Lupus – ANA, Dsdna, C3/4
 - Infections – Hep B/C, HIV
 - Plasma Cell Dyscrasias – EPP, SFLC, BJP, Igs
 - Diabetes –HBA1C
 - Drugs
 - Membranous Nephropathy – anti-PLA2R



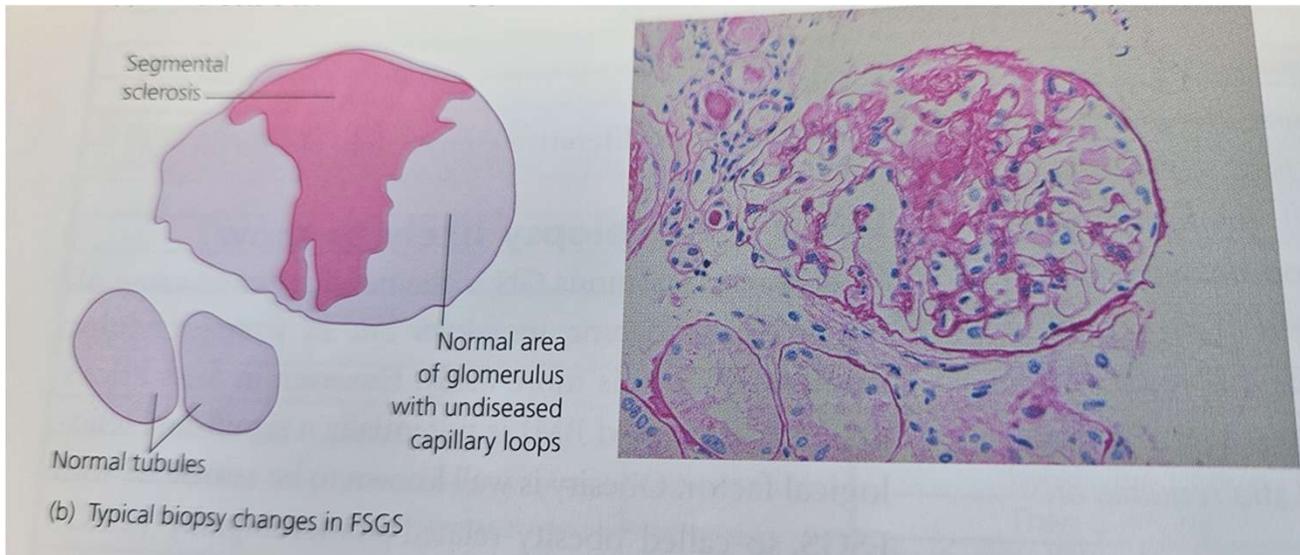
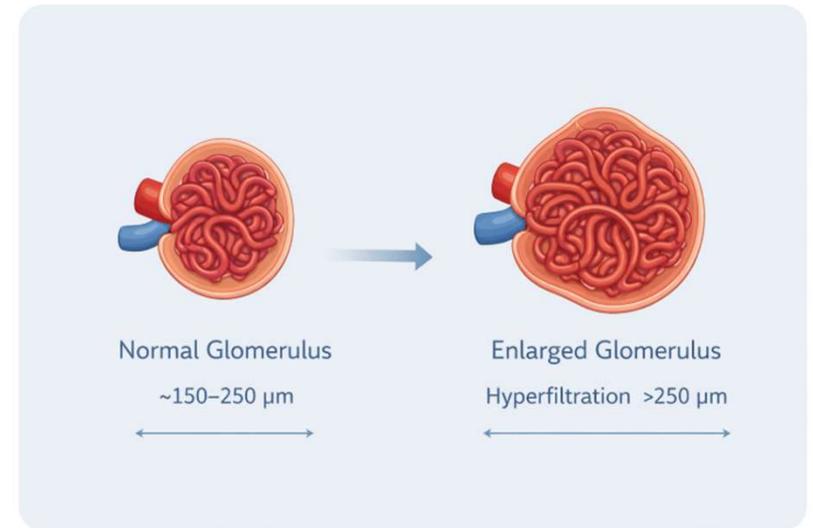
- General rule of thumb, all adults with Nephrotic Syndrome should undergo a **renal biopsy**, unless clear contra-indications (e.g. single kidney, advanced pregnancy)
- BP needs to be optimised prior to biopsy
(at least SBP < 150mmHg)
- Use ACEi or ARB first line



What is her biopsy likely to show?

- Minimal Change Disease – most common cause of nephrotic syndrome in younger adults
- Membranous Nephropathy – most common in older adults
- Focal, Segmental Glomerulosclerosis (FSGS) – next most common

Her Biopsy



Sclerosis is:
focal (not all glomeruli)
segmental (part of the tuft)

Obesity Related Glomerulopathy

- FSGS variant with Glomerulomegaly
 - Vasoactive compounds (e.g. Ang) from adipose -> **Glomerular Hyperfiltration**
 - Glomeruli enlarge to accommodate higher flow
 - Podocytes Stretching and low Adiponectin levels lead to:
 - foot process effacement
 - podocyte detachment
 - denuded GBM
 - Segmental sclerosis
- **Proteinuria** appears (Nephrotic Syndrome actually uncommon)
Long term proteinuria -> Loss of Kidney Function

Management Of Obesity FSGS

- Weight loss can bring about dramatic improvement in proteinuria
 - Manage vascular disease, e.g. statins, Tight BP control
 - RAS blockade – often proteinuria improves with this
 - SGLT2 would make sense – no trial evidence
 - GLP-1 to help with weight loss and vascular disease would also make sense.
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- **Prognosis**
 - ESKD may develop in 10-30% depending on which study you look at. Progression tends to be over 5 years or more.

Case 4

- Bob, 70 year old who is hypertensive at GP visit despite the medication he is on.

Past History:

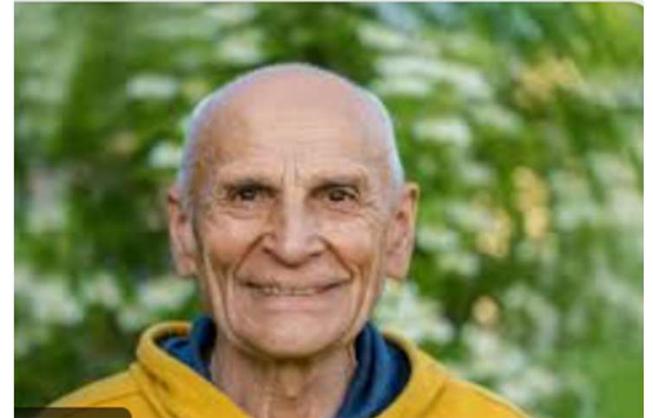
NSTEMI 2 years ago

HTN diagnosed at time of MI

COPD

Ex-smoker 40 pack years

CKD 3, EGFR 51



Further History

- 30U alcohol/week
- SOBOE – relieved by salbutamol inhalers. No orthopnoea or SOA.
- No chest pain, no headaches
- Cramping in his calves when walks, R>L, onset after about 50m
- Your colleague tried to introduce perindopril 4mg od last month but his creatinine went from 129 to 250umol/L

Meds:

aspirin 100mg od

Bendroflumethazide 2.5mg od

Amlodipine 10mg od

Simvastatin 20mg od

Examination

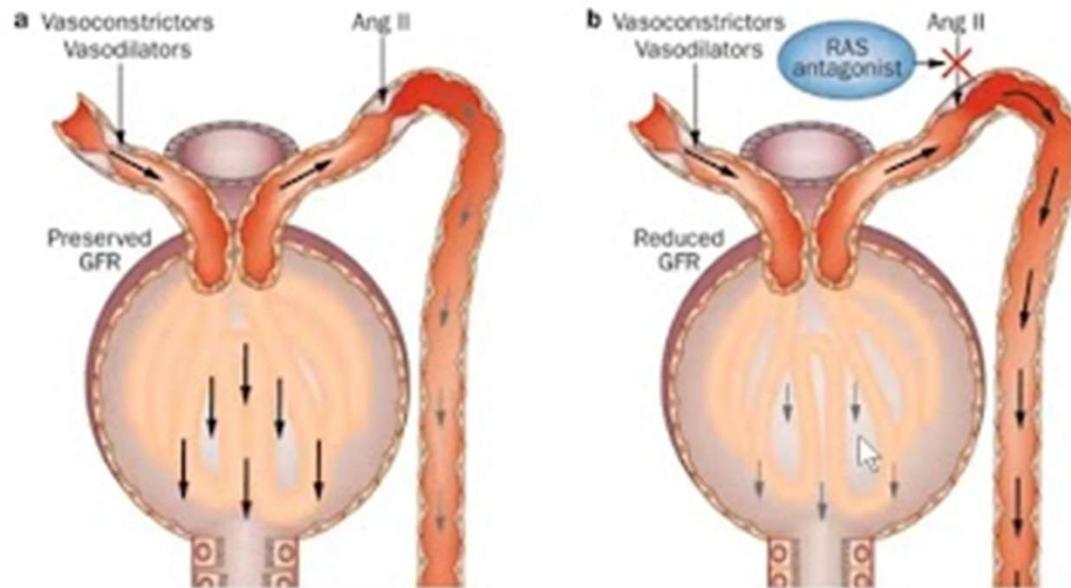
- 85/min, regular
- 159/101mmHg
- Dry mm, low JVP
- Chest – hyper inflated, no wheeze
- Xanthelasma over both eyes
- Carotid bruit right side, bruit in abdomen, no pulsatile mass
- Absent pedal pulses
- Hair loss on distal limbs bilaterally
- 1 small ulcer on his right great toe, some mottling of foot with cap refill 4s.



RAS Blockade

indicated

- Loss of renal efferent arteriolar vasoconstriction:
 - Acute decrease in intra-glomerular pressure → **fall in GFR**



Do you think Bob's HTN is Essential or Secondary?

- He is an arteriopath

→ History makes me think of Renal Artery Stenosis

- Next steps?

1. control the BP – probably an alpha blocker
2. speak to him about lifestyle measures, manage CVD risks, vasc surg ref?
3. Investigate for RAS

Investigations

Renal Tract Ultrasound

- In Reno-vascular disease Asymmetric kidneys are common typically 1 Kidney $>2\text{cm}$ shorter than other
- Good first line investigation

MRA or CTA

Invasive Angiogram

