Exercise walk-through

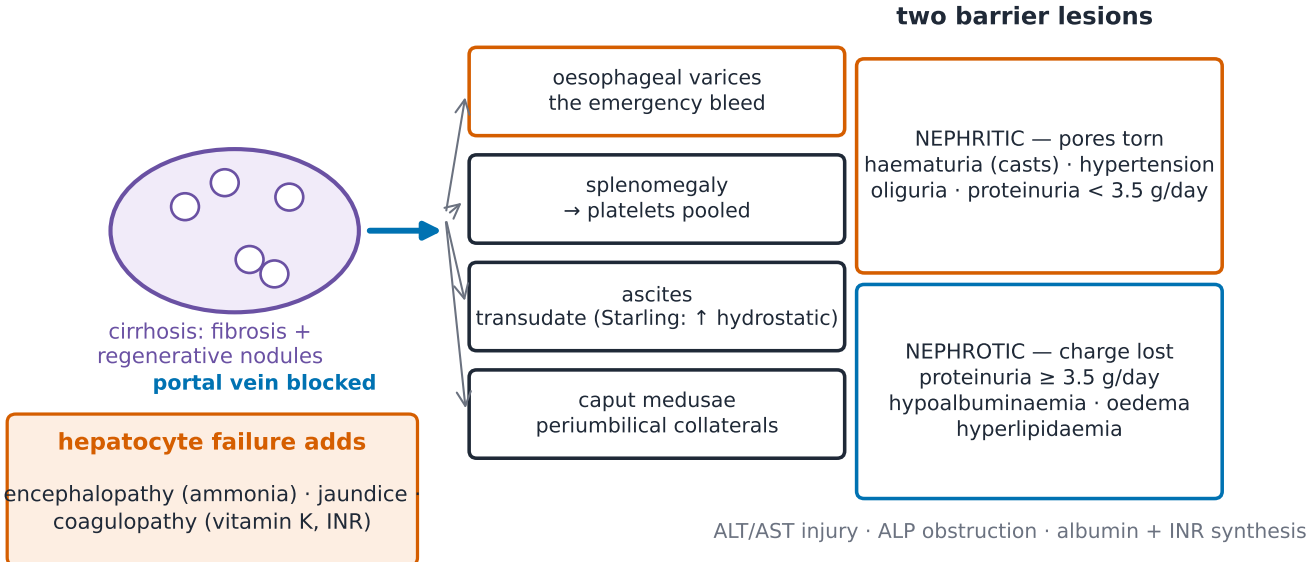
10.6
Gastrointestinal, liver and renal pathology

University Medicine

Liver and kidney: patterns

1. **Portal Cirrhosis** (fibrosis + regenerative nodules) $\rightarrow$ **portal hypertension**: varices, splenomegaly (platelets pooled $\rightarrow$ thrombocytopenia), ascites, caput medusae; failure adds encephalopathy (ammonia), jaundice, coagulopathy (vitamin K, INR).
2. **Panel** ALT/AST injury · ALP obstruction · albumin + INR synthesis.
3. **Kidney** Nephritic: pores torn - haematuria with red-cell casts, hypertension, oliguria, proteinuria $<$3.5 g/day. Nephrotic: charge lost - frothy urine, proteinuria $\geq$3.5 g/day, hypoalbuminaemia, periorbital **oedema**, hyperlipidaemia.

Portal hypertension consequences



One blocked vein, five collateral consequences — and the two renal barrier lesions.

Exercises 2.1·2.3

2.1 Why does cirrhosis lower platelets? [3]

2.2 The nephrotic proteinuria line, with units? [3]

2.3 Which liver marker pair reports synthetic function? [3]

Exercises 2.1·2.3

2.1 Why does cirrhosis lower platelets? [3]

2.1

- Splenic sequestration – portal hypertension pools platelets in the enlarged spleen ✓.

2.2 The nephrotic proteinuria line, with units? [3]

2.2

- $\geq$3.5 g/day ✓.

2.3 Which liver marker pair reports synthetic function? [3]

2.3

- Albumin and INR ✓.

Exercise 3.1

3.1 A fictional patient with cirrhosis: vomiting blood, distended abdomen, drowsy, bruising.

Localise the bleed (oesophageal varices – the portal collateral emergency) ✓. Explain the ascites (portal hydrostatic ↑ + low albumin oncotic ↓) and the bruising (vitamin-K factors and INR – synthetic failure) ✓. Attribute the drowsiness (ammonia → encephalopathy) ✓. [8]

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3.1

- Varices: the emergency portosystemic collateral ✓.
- Ascites: ↑ portal hydrostatic plus ↓ oncotic (low albumin) ✓.
- Bruising: synthetic failure – clotting factors, vitamin K, INR ✓.
- Drowsiness: ammonia crossing into brain – encephalopathy ✓.

Exercise 3.2

3.2 Two fictional urines: A – Coca-Cola urine, red-cell casts, BP up, protein 1.2 g/day; B – frothy urine, protein 4.2 g/day, albumin 2.4 g/dL, periorbital oedema.

Classify A (nephritic – torn pores) and B (nephrotic – lost charge) with the quantitative line ✓. Explain why B oedemas (oncotic fall) while A is hypertensive (inflammatory renin and volume) ✓. [7]

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3.2

- A: nephritic – blood with casts, hypertension, protein <3.5 ✓.
- B: nephrotic – 4.2 g/day ≥ 3.5, albumin 2.4 low, frothy urine ✓.
- B oedemas: albumin lost $\rightarrow$ oncotic falls $\rightarrow$ periorbital swelling ✓.
- A hypertensive: inflammation drives volume and renin ✓.