Acute Renal Failure

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Definition Acute Renal failure (ARF)

- Inability of kidney to maintain homeostasis leading to a buildup of nitrogenous wastes

ARF

- Occurs over hours/days
- Lab definition
  - Increase in baseline creatinine of more than 50%
  - Decrease in creatinine clearance of more than 50%
  - Deterioration in renal function requiring dialysis

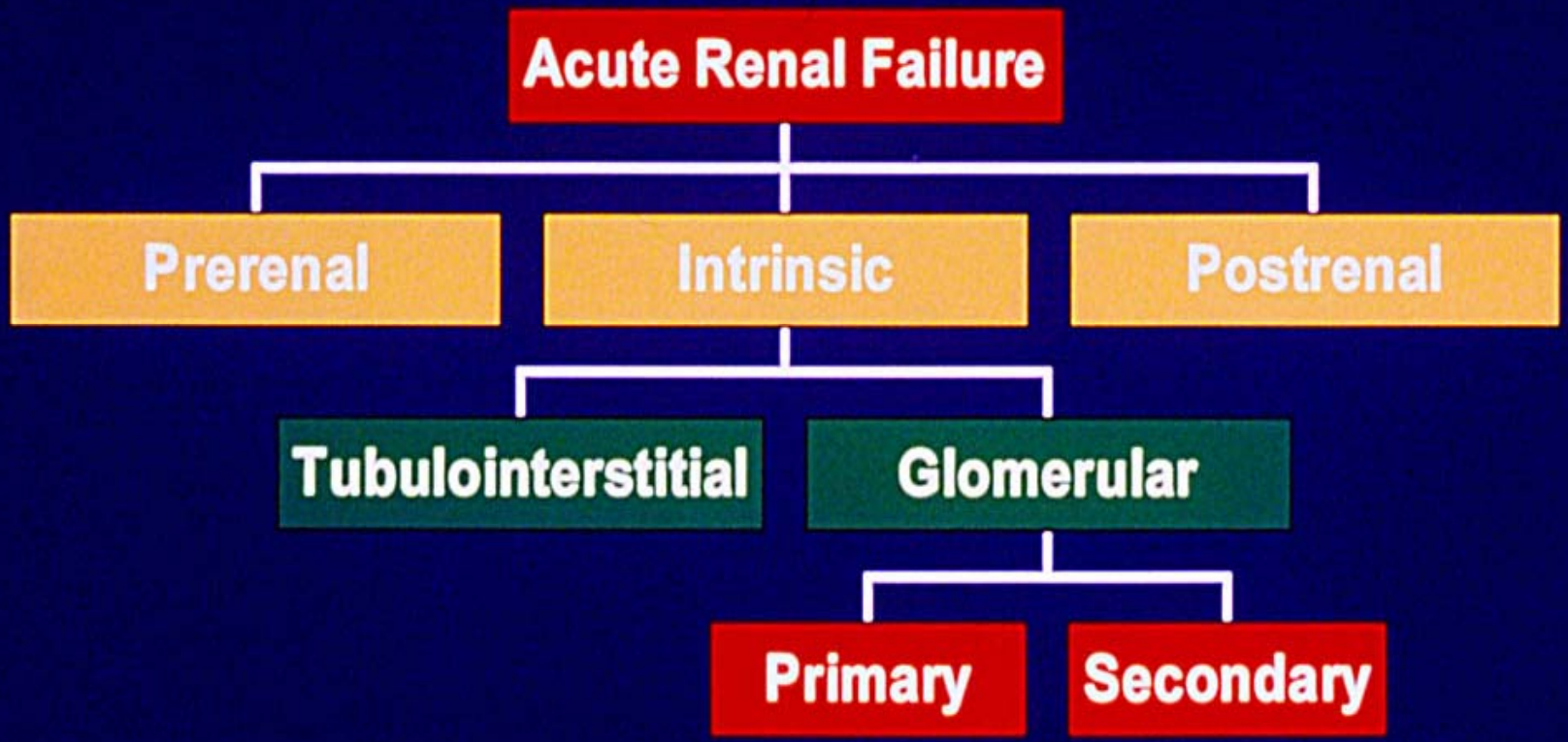
ARF definitions

- Anuria – no urine output or less than 100mls/24 hours
- Oliguria - <500mls urine output/24 hours or <20mls/hour
- Polyuria - >2.5L/24 hours

ARF

- Pre renal (functional)
- Renal-intrinsic (structural)
- Post renal (obstruction)

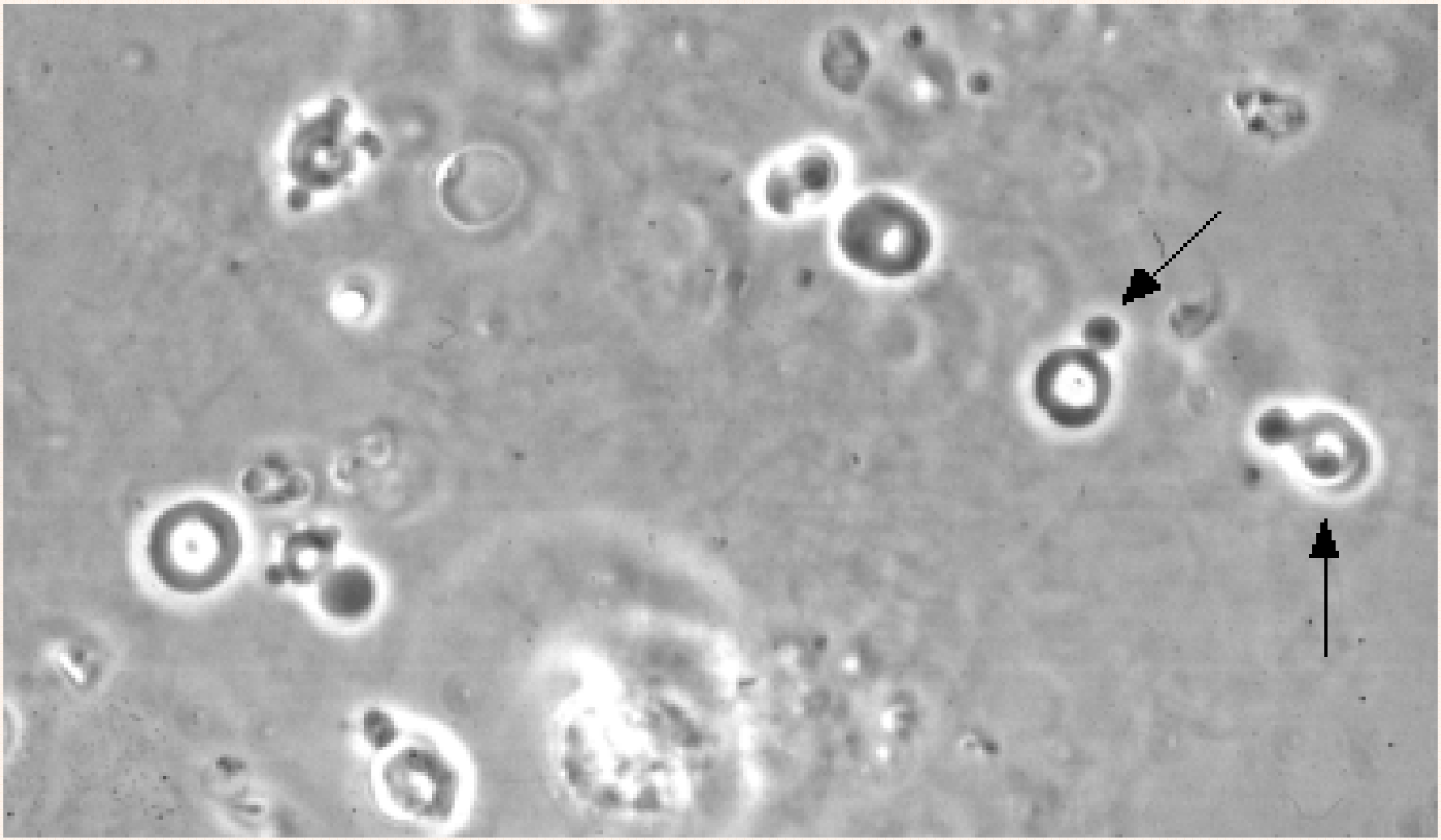
Work-up of Acute Renal Failure



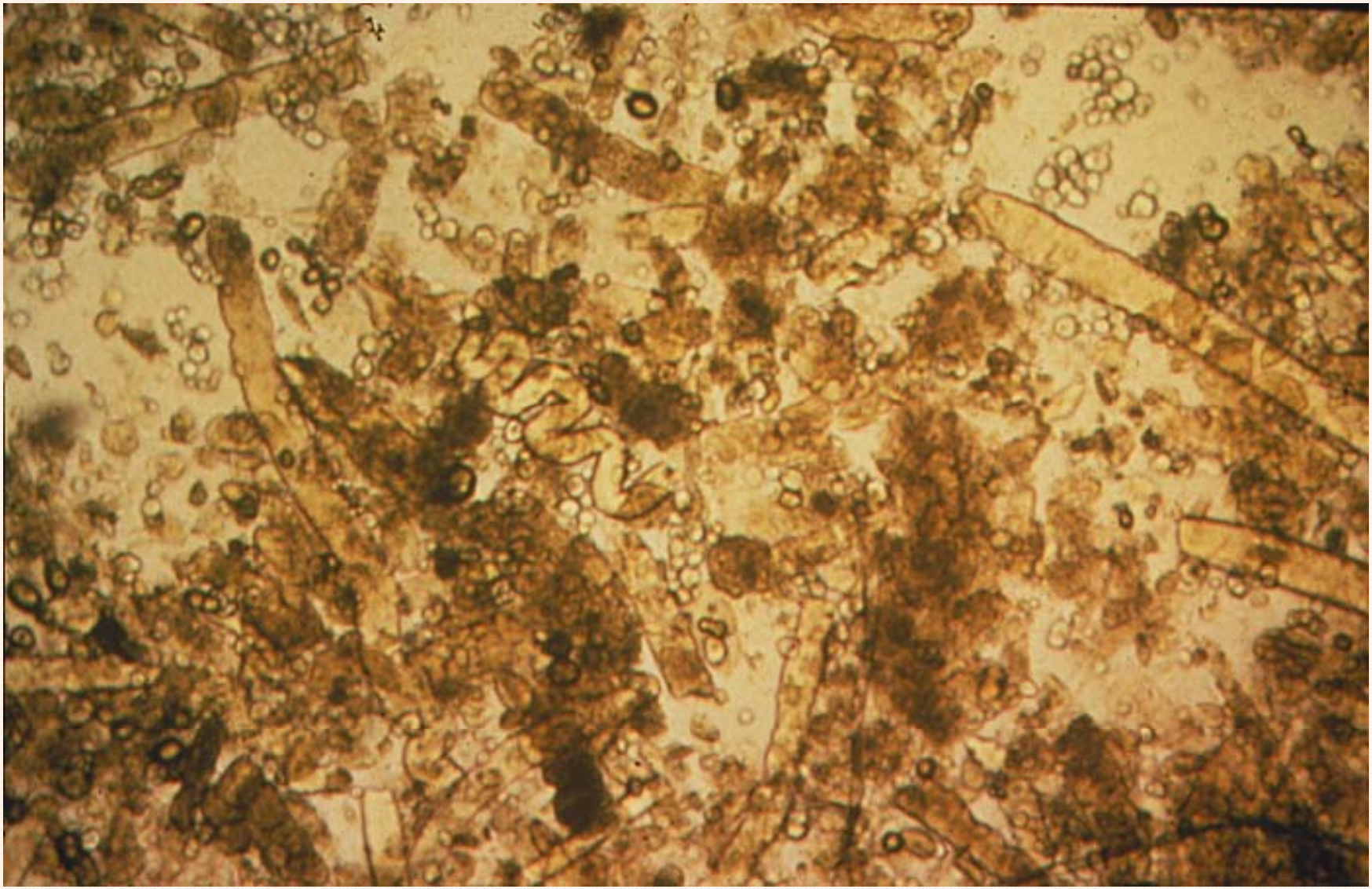
Causes of ARF

Pre-renal	**Renal**	**Post-renal**
Absolute hypovolaemia	Glomerular (RPGN)	Pelvi-calyceal
Relative hypovolaemia	Tubular (ATN)	Ureteric
Reduced cardiac output	Interstitial (AIN)	VUJ-bladder
Reno-vascular occlusion	Vascular (atheroemboli)	Bladder neck-urethra

Dysmorphic Red Blood Cells



Pigmented Granular Casts



ACUTE RENAL FAILURE: CASE STUDY #1

- a woman, age 45, was admitted to the emergency room following a major automobile accident
- She had massive abdominal injuries and a fractured femur.
- She was taken immediately to surgery for repair of a lacerated liver and perforated ileum.
- She had two units of blood during surgery and two units while she was in the recovery room.
- The fifth unit of blood was discontinued in surgical intensive care because she developed a transfusion reaction.

- On the day after surgery, her urine output declined to 10-20 ml/hr. Increasing her fluid intake with plasma expanders and blood did not increase her urine output.
- Lab results indicated an elevated urinary sodium, BUN 70 mg/dl, and serum creatinine 4 mg/dl.
- Her urine output stabilized at 20-25 ml/hr on the third day after surgery. She was diagnosed as having acute tubular necrosis.

QUESTIONS

- What are the possible causes of acute tubular necrosis
- What clinical indicators that she is in the oliguric phase of acute renal failure

- . What is the goal of medical management of this patient?

Case II

- A 75 y old man come to clinic for nausea and vomiting loss of appetite
- Long time history of dysuria, frequency, nacturia, terminal dribbling,
- On Ph E there is 3 + edema, Pale ness, high blood pressure, no remarkable chest finding, distended abdomen and hypogastreic tenderness

- Lab finding; BUN= 120 mg/dl Cr= 6mg/dl k= 6 meq/l Na = 140 meq/l BS = 90 mg/dl

QUESTIONS

- What will you do in clinic for approach the diagnosis
- What is the best management for this patient

- 72-year-old man was initially admitted to our department because of hyperkalemia (serum potassium 5.6mmol/L) and a mild decrease in renal function.
- He had a long history of diabetes mellitus treated with intermediate-acting insulin followed by diabetic retinopathy and autonomic neuropathy, which presented with postural hypotension, impaired gastric emptying, and diarrhoea aggravated by food ingestion.
- The laboratory data on admission were haematocrit 35 % (0.35), serum urea 45 mg/dl
- creatinine 1.6 mg/dl
- glucose 154 mg/dl
- HbA1c 8.4 %
- total protein 6.9 g/dl
- sodium 138 mmol/L
- potassium 5.6 mmol/L, chloride 109 mmol/L, bicarbonate 18 mmol/L, $_2$

- However, one month later, the patient experienced a deterioration of watery diarrhoea of 3 days' duration and was readmitted to our department.
- On physical examination, there were signs indicative of profound volume depletion, such as diminished skin turgor and postural hypotension (blood pressure was 130/90 mmHg in sitting position and 105/75 mmHg in upright position).

Serum urea, mg/dl (mmol/L)	123 (44)
Serum creatinine, mg/dl (µmol/L)	2.8 (247.5)
Serum total proteins (g/L)	84
Serum sodium (mmol/L)	138
Serum potassium (mmol/L)	5.4
Serum chloride (mmol/L)	111
Serum calcium, mg/dl (mmol/L)	9.9 (2.47)
Serum phosphorus, mg/dl (mmol/L)	3.5 (1.13)
Serum magnesium (mmol/L)	0.8
PRA (ng/ml/h)	0.12

Question

- What is the cause of increased SCr ?
- Sign ?
- Symptoms?
- Clinical finding ?
- How do you manage this case