

Differential diagnosis of hematuria and renal failure

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Hematuria

= erythrocytes in urine



No diagnosis of hematuria without confirmation
in urinary sediment

Microscopic **x** macroscopic

Glomerular **x** non-glomerular



Dark urine colour

- Hematuria
- Hemoglobinuria
- Myoglobinuria
- Urates
- Porfyrin*
- Alkaptonuria*
- Melanogen *
- Drugs (rifampicin, metronidazole, furantoin, phenytoin)
- Plant dyes (capsicum, beet root)
- Food additives
- Bilirubin

* The colour can be seen only after longer standing of the urine



Causes of hematuria

Hematological

- Coagulation disorders
- Anticoagulants
- Sickle-cell anemia

Infections

- Tuberculosis
- Non-specific infections of the urinary tract
- *Leptospirosis*
- *Tropical infection, e.g. yellow fever*

Inflammation

- Glomerulonephritides (acute, chronic, *rapidly progressive*)
- *Goodpasture syndrome*
- *Systemic diseases*
- Postirradiation



Causes of hematuria

Structural

- Stones
- Cysts
- Cystic kidney diseases
- *Blood vessel anomalies*

Iatrogenic

- *Invasive procedures*
- *Complications of biopsy*

Toxins

- Sulfonamides
- Cyclophosphamide
- NSAIDs
- Antibiotics
- Phenols



Causes of hematuria

Injury

- *Catheter or foreign body*
- *Bland trauma*
- Prolonged exercise
- Rapid emptying of a distended bladder

Tumor

- *Renal cancer*
- *Wilms tumor*
- *Prostatic, ureter or bladder cancer*

Hereditary

- Alport syndrome
- Polycystic kidney disease

Miscellaneous

- Genital bleeding
- Menstruation (endometriosis)
- Intentional damage (Münchhausen syndrome, Münchhausen syndrome by proxy)



?

microbiology

positive

negative

coagulation

normal

ultrasound

normal

Phase contrast

glomerular

Non-glomerular

IV urography, CT

abnormal

normal

cystoscopy

abnormal

normal

arteriography

abnormal

normal

observation

Renal biopsy

infection

Hematological disorders

Hematoma
Tumor
Cyst
Stones
Diverticles
Papillary necrosis

Chronic pyelonephritis

Cystitis

A-V malformation
Renal vein thrombosis

Glomerulonephritis
Interstitial nephritis
Alport syndrome
Thin membrane syndrome



Real life

Exclude or confirm

„urological“ life threatening conditions

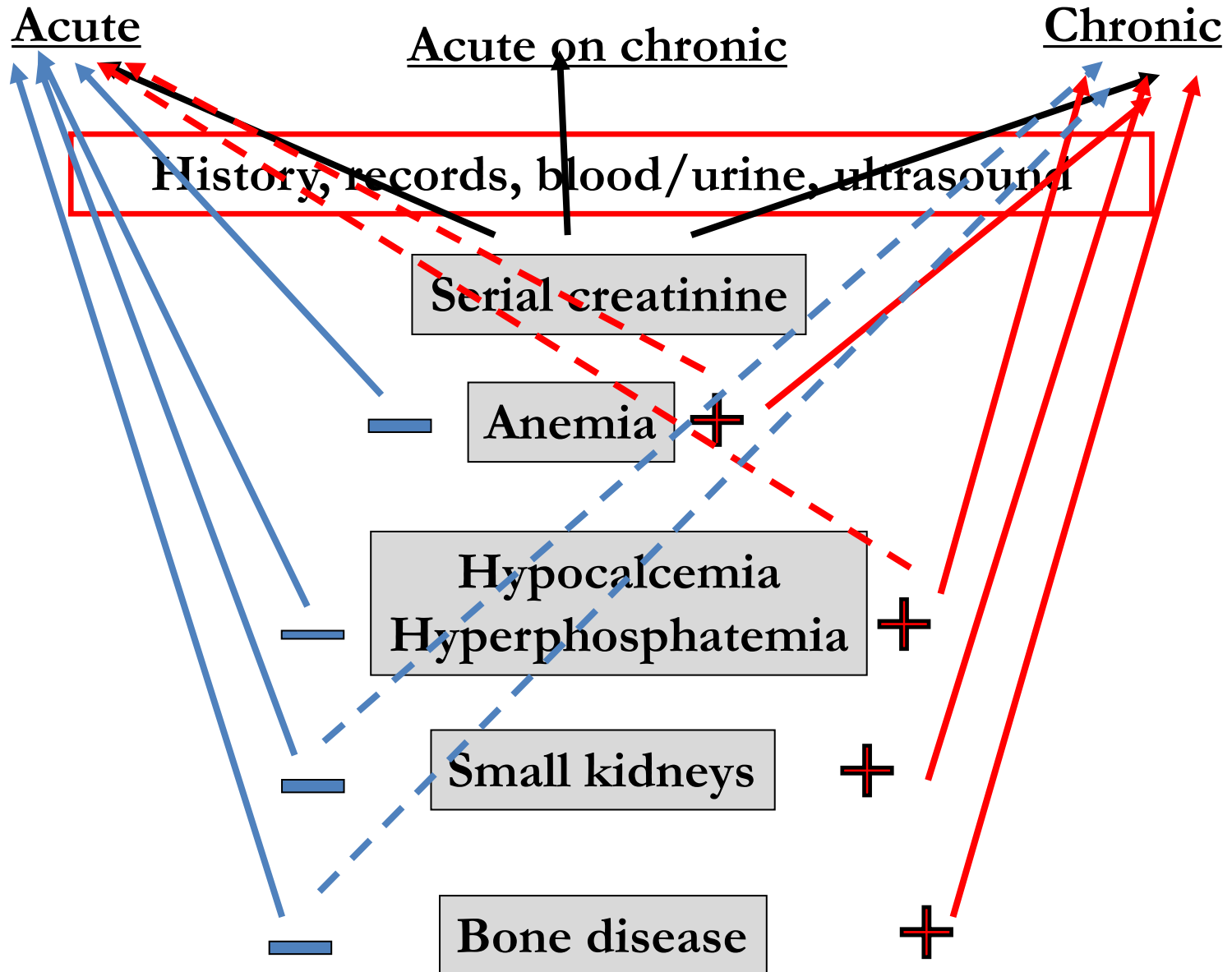
- Injury (including iatrogenic)
- Malignancy
- Large vessel bleeding

„nephrological“ function/(life) threatening conditions



- Systemic infection
- Systemic inflammatory disease
- Active glomerulonephritis
- Hereditary disease

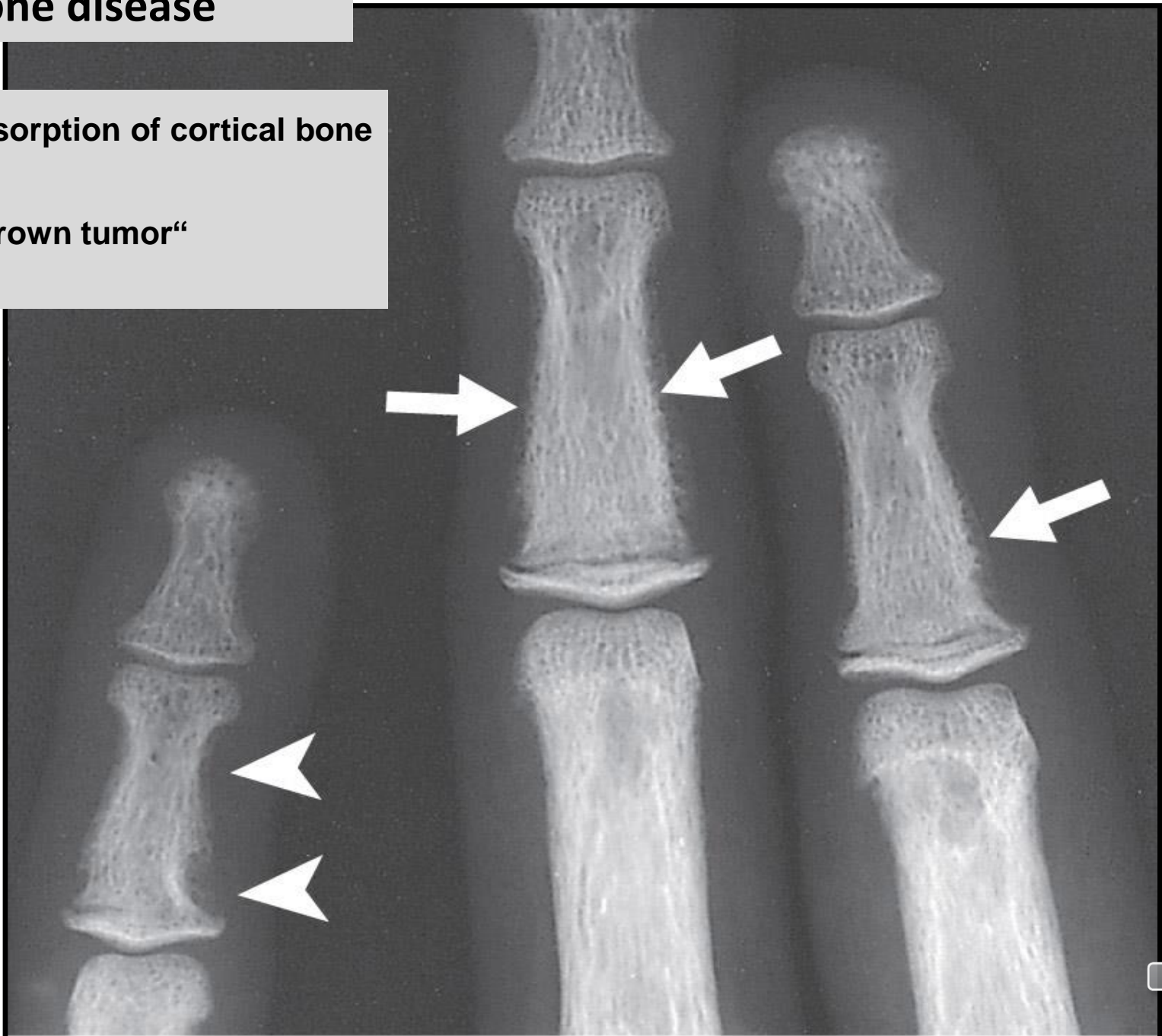


Renal failure



Bone disease

 Resorption of cortical bone
 „brown tumor“



History, records, blood/urine, ultrasound

