



APPROACH TO HEMATURIA



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APPROACH TO HEMATURIA

What is Hematuria?

- Hematuria is defined as 2-5 RBCs per HPF in urine microscopy.¹
- Can be detected by dipstick.
- False positive dip stick in myoglobinuria and hemoglobinuria

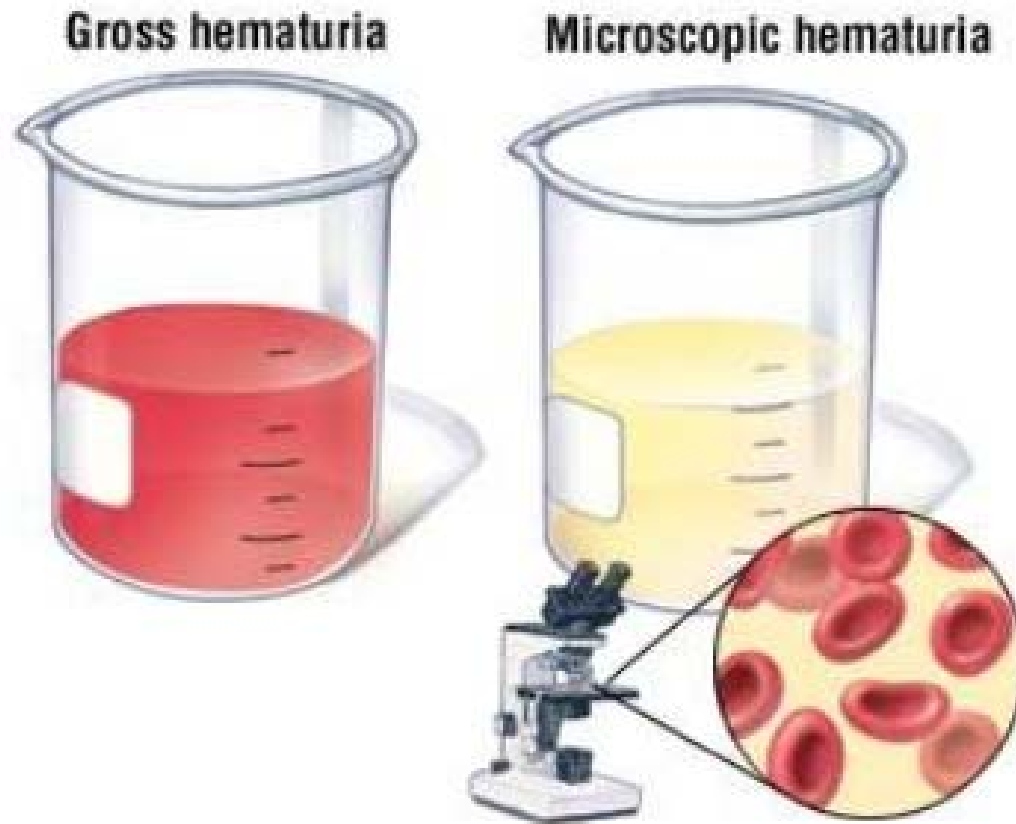


Is it really blood?

- Hematuria **Vs** pigmenturia (discoloration of urine)
- Hematuria **Vs** hemoglobinuria and myoglobinuria



Gross vs Microscopic hematuria



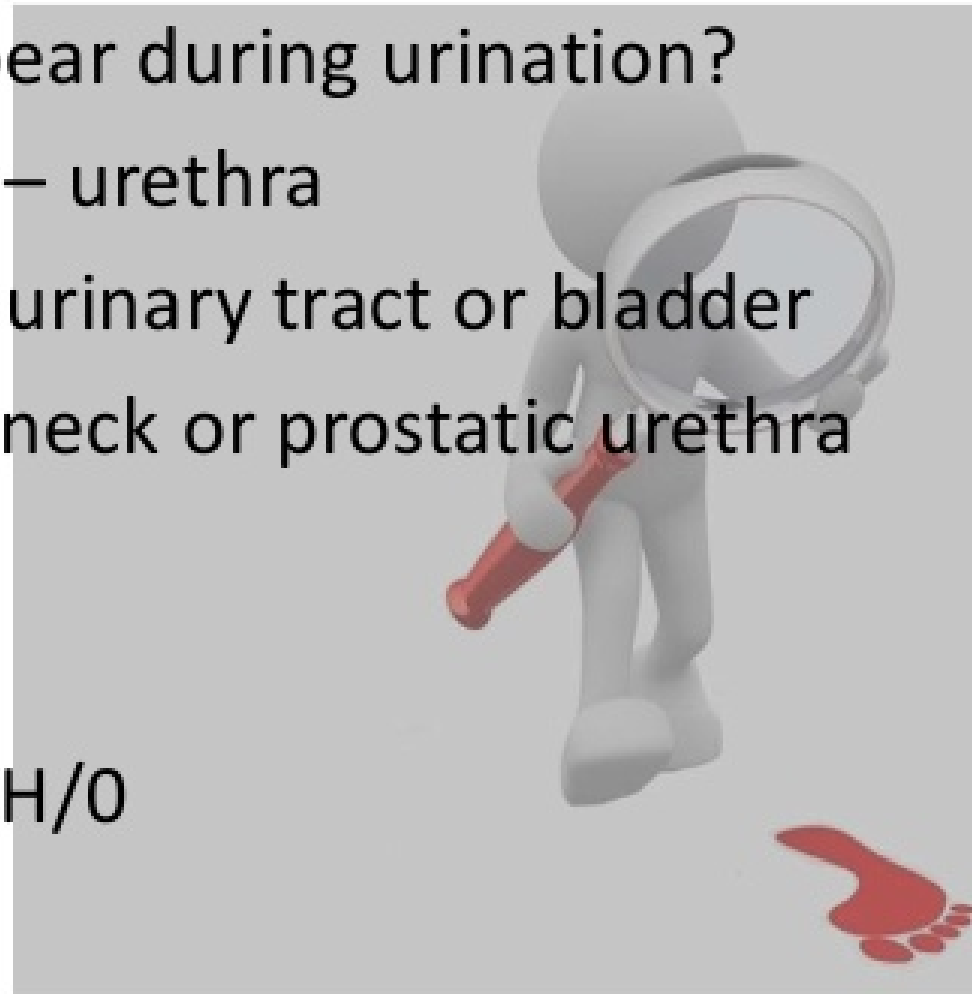
Is that hematuria significant?

- A single urine analysis with hematuria is common and can result from menstruation, viral illness, allergy, exercise or mild trauma.¹
- >3 RBCs per HPF on three urine analyses **or** a single urinalysis with >100 RBCs **or** gross hematuria is SIGNIFICANT.¹



Clues from history

- When does blood appear during urination?
 - At start of urination – urethra
 - Through out- upper urinary tract or bladder
 - At the end- bladder neck or prostatic urethra
- Frequency and pain?
- H/o any medications?
- Family H/O and travel H/O



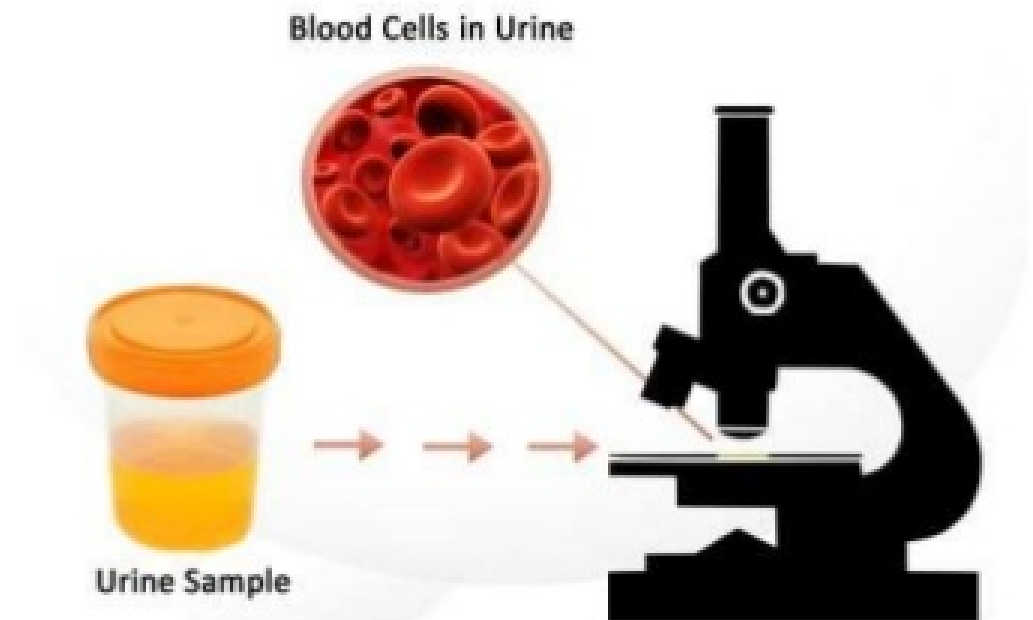
Physical examination

- Hypertension especially if new, may be a sign of renal disease.
- Petechiae, rash suggests coagulopathy, immunological disease, vasculitis.
- Examination of urethral meatus.



Laboratory analyses

- Is there protein in the urine?
- Are there cells or casts in the urine?
- Does the patient have a bleeding diathesis?



Drugs causing hematuria²

- Analgesics
- Anticoagulants
- Busalfan
- Cyclophosphamide
- Oral contraceptives
- Penicillins (extended spectrum)
- Quinine
- Vincristine

Systemic causes of hematuria²

- Bleeding diathesis
- Sickle cell disease

Dr Abdollahpoor



- Approach to hematuria

Dr Getmiri



- Glomerular hematuria
case presentation

Dr Maziar



- Non Glomerular hematuria
Case presentation

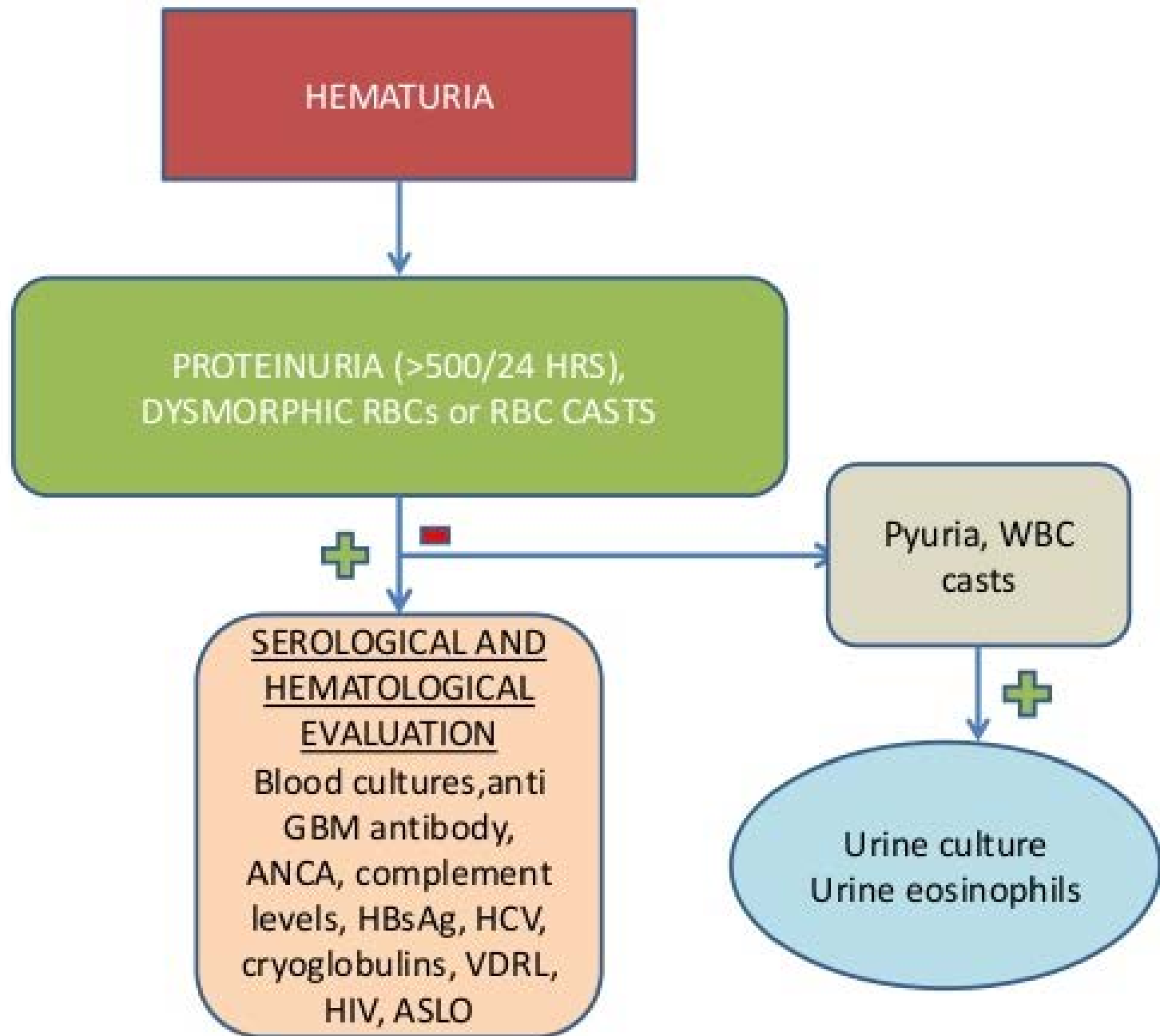
Dr Hoseini



- Urologic approach to hematuria

Interpretation

- Isolated hematuria without proteinuria, other cells, or casts is often indicative of bleeding from urinary tract.¹
- Common causes of isolated hematuria are stones, neoplasms, TB, trauma and prostatitis.
- Gross hematuria with blood clots suggest postrenal source.



Normal erythrocytes



Fresh erythrocytes,
no double contour



Fresh erythrocytes,
with double contour



thorn apple shape



shadow of erythrocyte
without margin



shadow of erythrocyte
with margin remnants
+/- spikes



deformed shadow
of erythrocyte



deformed erythrocyte
curly double contour

Glomular erythrocytes



simple ring shape



curly ring shape



curly ring shape
slitted



ring shape with
surface protrusion



ring shape with
surface protrusion



ring shape with
internal bleb



ring shape with
internal bleb

Hematuria without proteinuria, pyuria,
WBC casts

Hemoglobin electrophoresis
Urine cytology
UA of family members
24 h urine calcium/ uric acid

-
IVP+/-
Renal USG

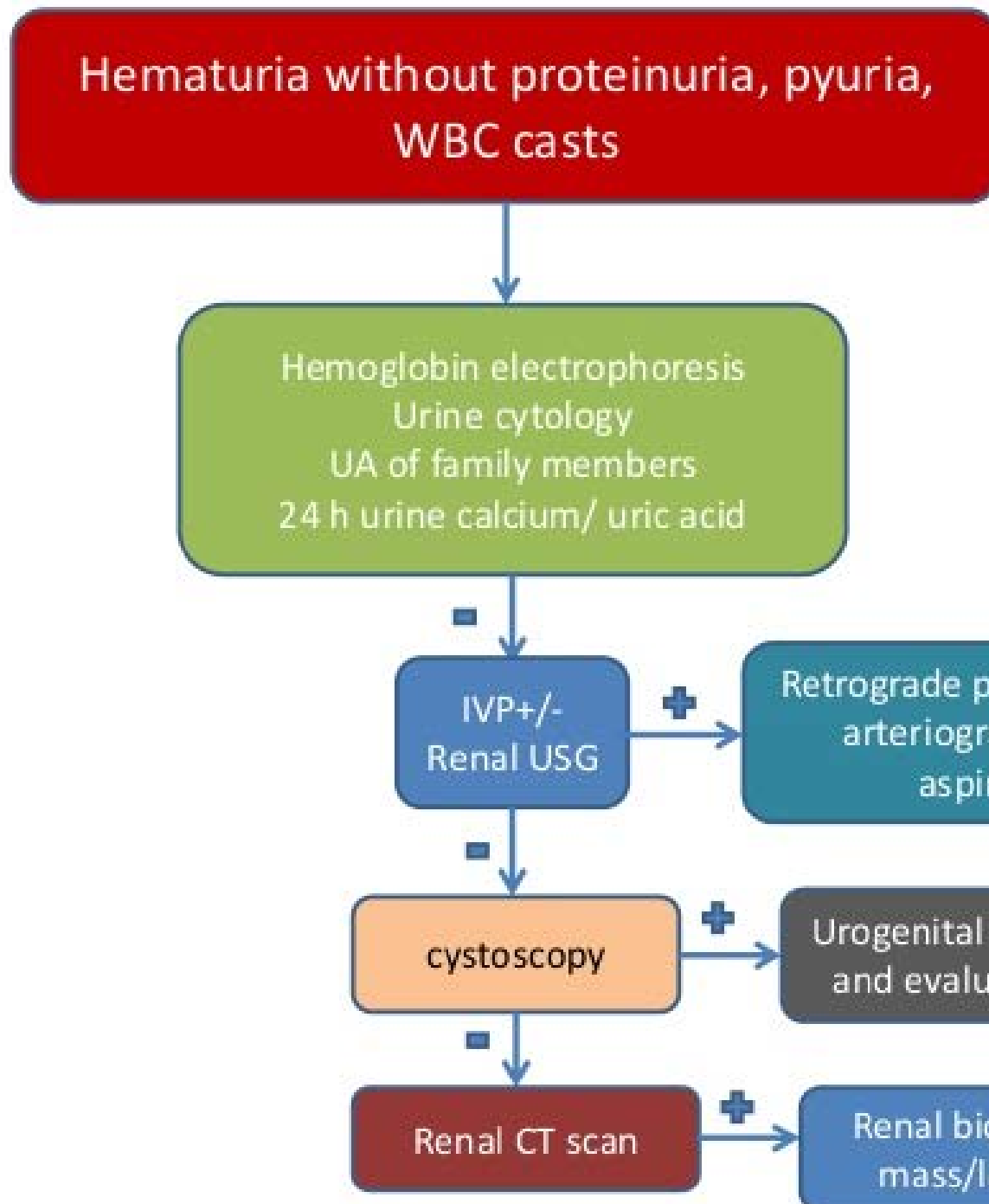
+
Retrograde pyelography or
arteriogram or cyst
aspiration

-
cystoscopy

+
Urogenital biopsy
and evaluation

-
Renal CT scan

+
Renal biopsy of
mass/lesion



Interpretation

- Isolated microscopic hematuria can be a manifestation of glomerular diseases.
- RBCs of glomerular origin are often dysmorphic when examined by phase contrast microscopy.

Causes are IgA nephropathy, hereditary nephritis and thin basement membrane disease.

Hematuria with dysmorphic RBCs , RBC casts and protein excretion >500 mg/d is virtually diagnostic of glomerulonephritis.¹

Interpretation

Even in the absence of azotemia, these patients should undergo serologic evaluation and renal biopsy.¹



Take home message

- Even if a dipstick test is positive, true question is whether it is blood in urine or free Hb or myoglobin.
- Hematuria + proteinuria = glomerular disease.
- Painless hematuria without proteinuria suggests coagulation disorders, cancers, structural anomalies.
- Colicky pain in pt with hematuria suggests stone.

