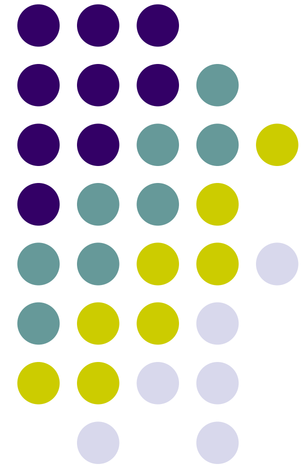
Hematuria- Current *approach for management*

This Presentation's sole purpose is free teaching and training of MBBS students not for any Commercial Purpose



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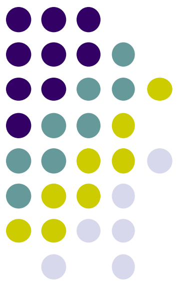

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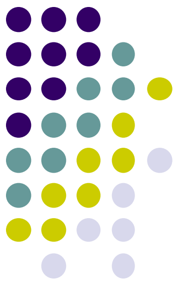
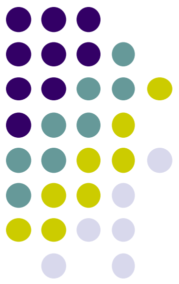
Objectives

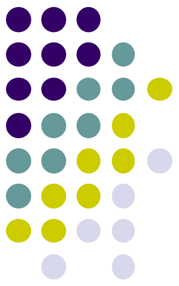


- Common case Scenarios
- Define and Classify Hematuria.
- Initial Management of Hematurea
- Discuss a rational diagnostic approach to the patient with hematuria.
- Discuss effective use of lab and imaging tests in the hematuria work-up.

Case 1

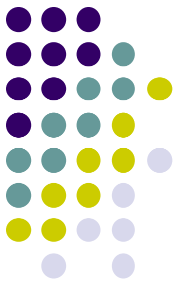


- A 55 years old male has history of recurrent painless hematuria for 6 months .
- Not associated LUTS or Fever .
- H/O of Smoking for 30 yrs
- Left renal Lump on examination.



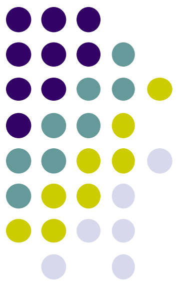
- How to proceed ?
- What is the Probable diagnosis?

Case 2



- A 50 years male had history of self-limiting recurrent Hematuria for last 2 years which was not associated with fever are any LUTS

- Now he is admitted in emergency with H/O of frank Hematurea with passage of clots and Retention of Urine



- How to proceed?
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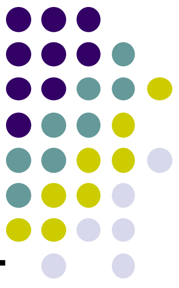
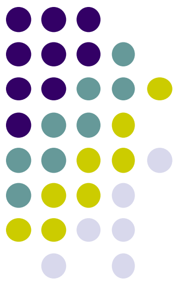
Case 3

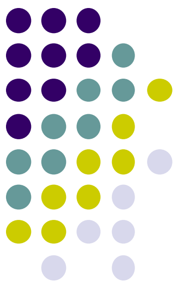


- History : 45 years old male has history of Left flank colicky pain 2 episodes since 3 weeks. He has history of taking medication- diclofenac for pain relief.
- Now he has presented in OPD with complaints of single episode of blood mixed urine associated with pain left lumbar region.



- What is the probabale diagnosis?
- How to proceed?

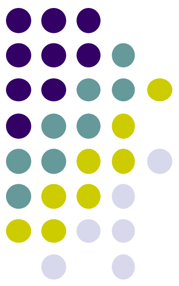
Case 4



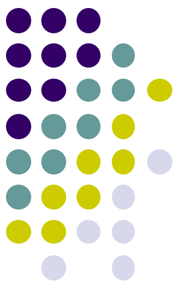
History of RTA 2 hours back

A 28years male has been brought to Emergency/Casualty Room with while driving a motorcycle and he fell on his back over pavement.

On primary survey, His airway is clear; RR – 20/min, Bony crepitus right lower chest, bruise over right back and lower chest; BP- 80/60 mm Hg, PR 130/min. He has passed urine mixed with Blood .

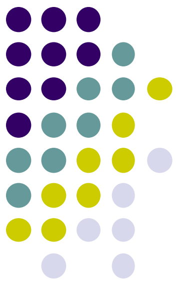


- What is the Probabale diagnosis?
- How to proceed?



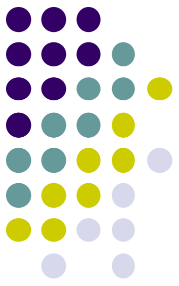
Case 5

- A 30 years old male has been brought to emergency with history of RTA 4 hours back while has driving a bicycle and he fell on pavement over his lower abdomen. He has not passed urine since then.
- On evaluation his airway is clear; Breathing , RR 16/min ; BP 110/70 mmHg, PR 110/min; GCS – 15/15.



- What is the probabale diagnosis?
- How to proceed?

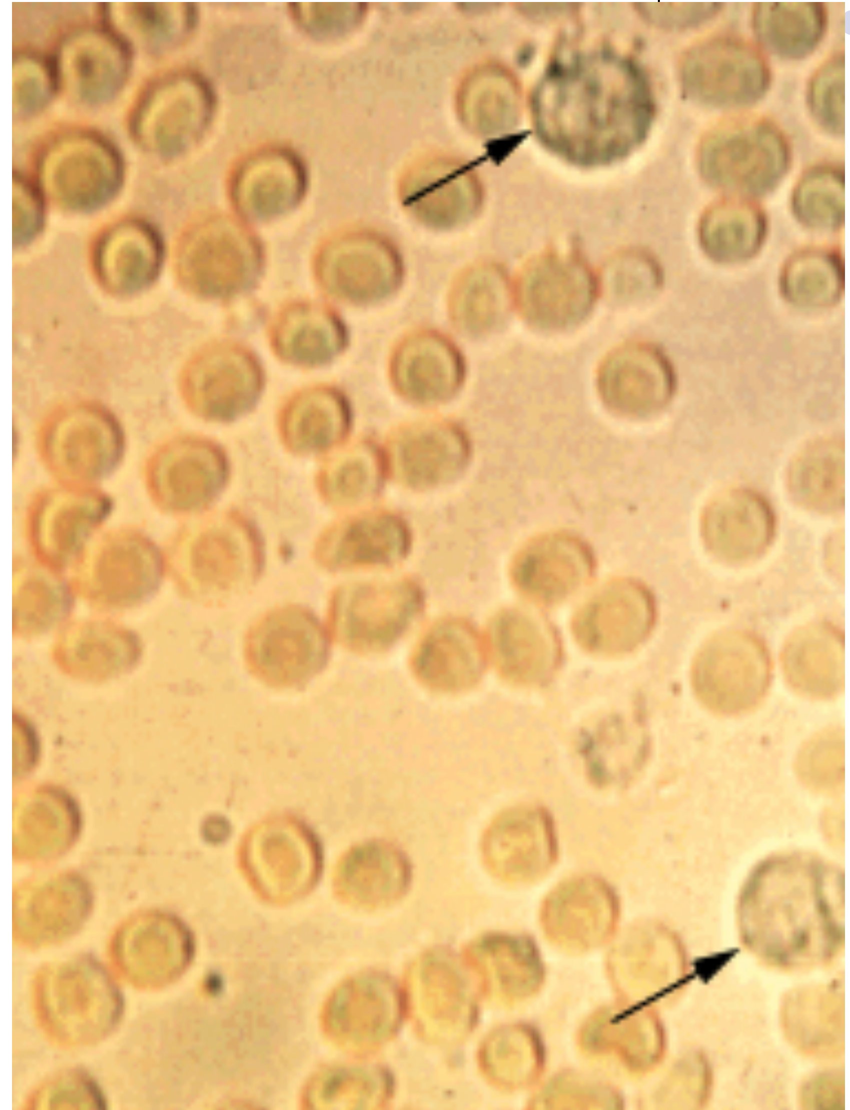
Q1: Hematuria is defined as 2 of 3 samples with:



1. Any number of RBCs per hpf.
2. More than 3 RBCs per hpf.
3. More than 30 RBCs per hpf.
4. 3+ blood on urine dipstick.
5. Visibly red urine.

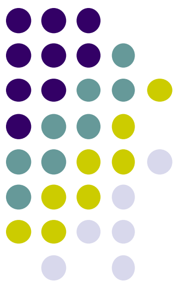
Definitions

- Hematuria is defined as **three or more RBCs per high-powered field** on urine microscopy, **from 2 of 3 specimens.**



In this photo, arrows point to WBCs surrounded by monomorphic RBCs.

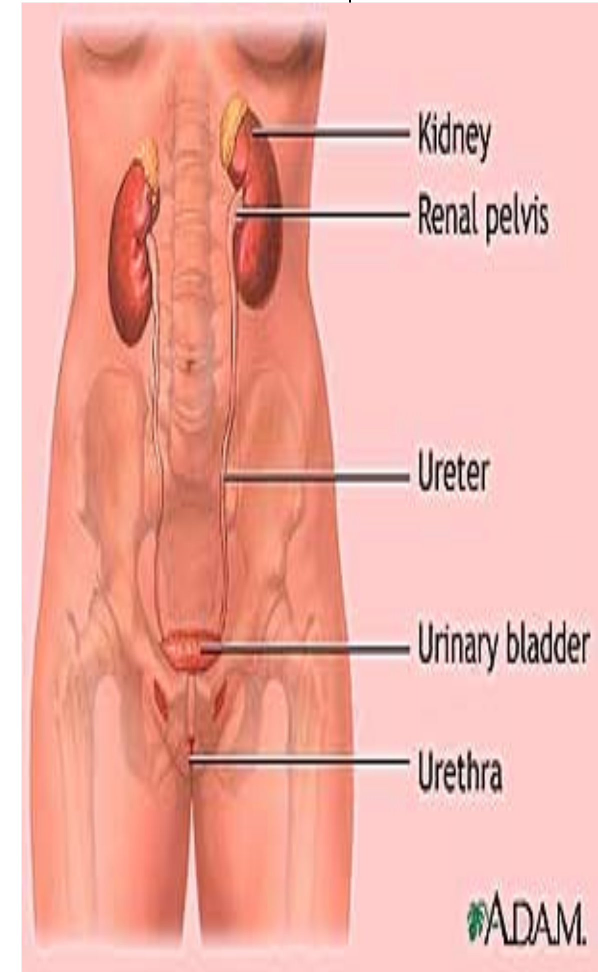
Definition- Passing *Blood mixed with Urine*



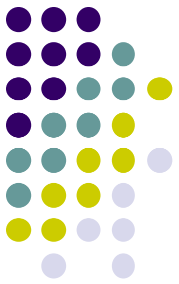
Grass : on Gross Examination

Microscopic : > 3 RBCs./ hpf

Rule out Urethral Bleeding



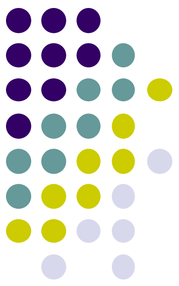
Is it Haematuria ?



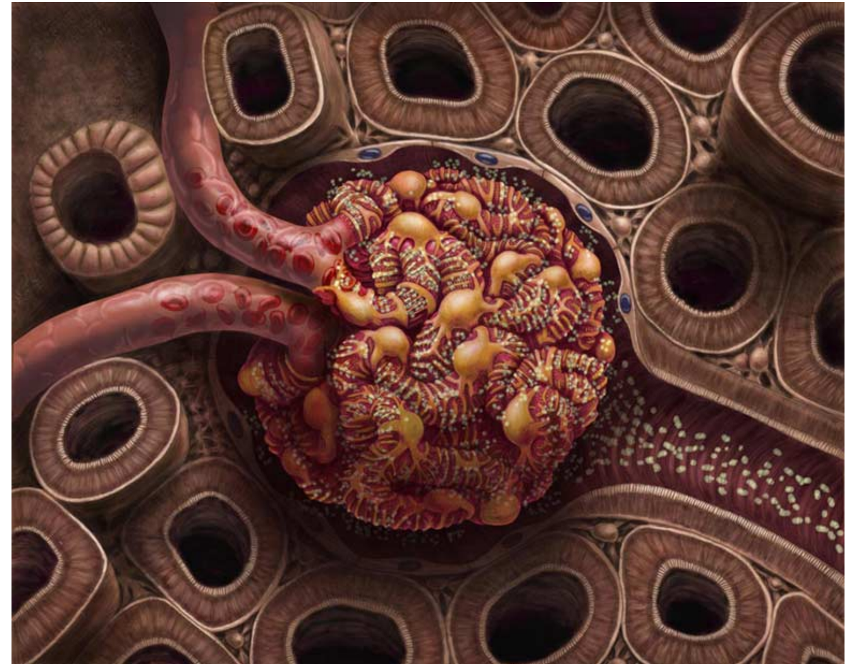
Red Colored Urine

- Haemoglobinuria / myoglobinuria
- Anthrocyanine – Beates & Blackberry
- Chronic Lead & Mercury Poison
- Phenolphthalein (laxative)
- Phenothiazine
- Rifampicin etc

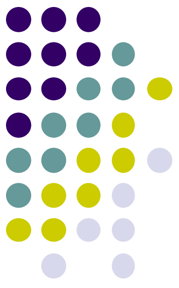
Classification



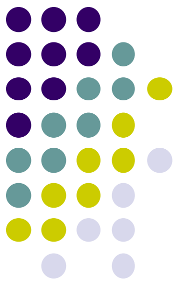
- CLINICAL
- Gross
    - frankly bloody
- Macroscopic
    - red urine
- Microscopic
    - not discolored
- PATHOPHYS
    - Glomerular
    - Non-Glomerular



How to confirm Diagnosis ?



- Grass Inspection
- Urine Dipstick test : High false positive so needs .Confirmation by M/E
- M/E Urine examination: *Gold standard*



Clinical Presentation

- **History**

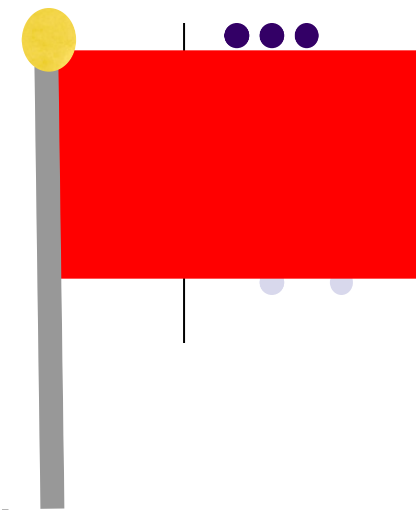
  Severity –Mild, Mod, Sever- Brisk

  Associated with Symptoms / Painless

  Total ,Terminal ,Initial ,

- **Examination**

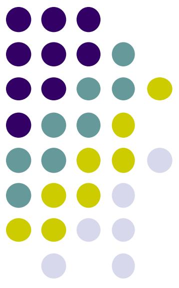
RED FLAGS



- Smoking history
- Occupational exposure to chemicals or dyes (benzenes or aromatic amines)
- History of gross hematuria
- Age >40 years (>50, some sources say)
- History of urologic disorder or disease (not simple UTIs)
- History of persistent irritative voiding symptoms
- History of recurrent or chronic urinary tract infection
- Analgesic abuse
- History of pelvic irradiation

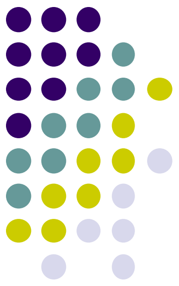
Source: Urology 2001;57(4)

Physical Examination



- Vitals
  - Fever ? Infection (Pyelo) HTN? (Glomerulonephritis)
- Heart
  - New murmur? (Endocarditis)
- Lungs
  - Crackles, Rhonchi? (Goodpasture's syndrome)
- Abdomen
  - Masses? (Cancer, Obstruction) Bruits? (Renal Ischemia)
- Extremities
  - Edema? (glomerulonephritis) rashes? (HSP, CTD, SLE)
- Rectal
  - BPH? Nodules, Hard ? (Cancer) Tenderness? (Prostatitis, Endometriosis)

Management– *Principle* *ABC….*



- **Assessment & Initial Tt**

  Resuscitation &

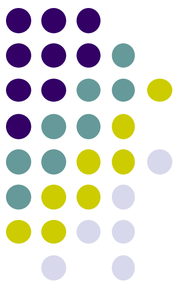
  Bleeding control

- **Be aware of Causes**

  Establishment of Diagnosis

- **Cure - Definitive Treatment**

Management– *Principle (Cont)*



- **Assessment : Initial Tt**

  Sever- Hemorrhagic Shock -Resuscitation

  Restoration of IV Volume- IV Fluid- (Crystalloids/Colloids)

  Blood Component Transfusion

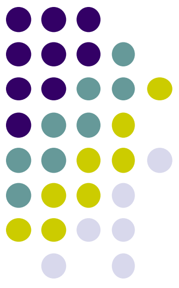
  Base line lab. Tests :

  Hb%, Hematocrit ,Renal function- Creatinine

  R/O Bleeding Diathesis : BT,CT,PT,PC,INR,Activated Thromboplastin Time , Platelet Count, etc

  Blood Cross match

Management– *Principle (Cont)*



- Conservative Tt : Bleeding Control

. Hemostatics :

Ethamsylate : **Cpillary Hmg.,250-500 mg tds ,iv/oral**

Tranexamic : **Acid Activation of Plasminogen ,500-1000mg/tid**

Adrenochrome : **Oxidised product of Adrenaline,10-20 mg/ day**

Botropause : **Venoum based ,1ml sos, up to 2to 3 times/ day**

Varios Combinations

.Antibiotics

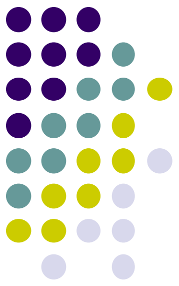
.Assurance , Anxiolytic

.IV Fluid

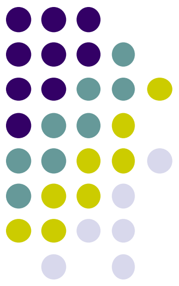
.Catheter If Retention – Bladder Irrigation

Be aware of Causes

Establishment of Diagnosis



CAUSES



1. **Medical** 2. **Surgical/Urological**

1. **Drugs** 2. **Nephrolgical** 3. **Bleeding Diathesis**

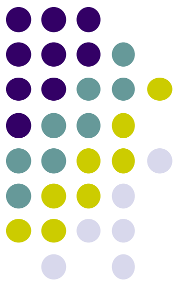
- **Glomerular**

  Cast,Proteinurea,Dysmorphic RBCs.

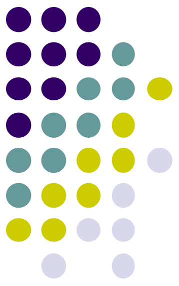
- **Tubulointerstitial**

  Uniform round RBCs

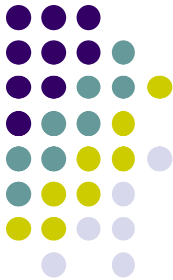
Glomerular - Casts and Dysmorphic RBCs (arrow)



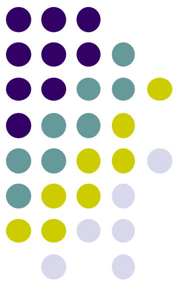
Glomerular - Acanthocytes

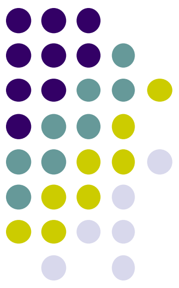


Non-Glomerular - Isomorphic RBCs



Trick Slide - Crenated RBCs (Arrowhead) in concentrated urine

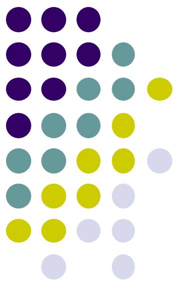




2. Surgical/Urological

- Tumor – Renal, Ureter ,Bladder, Prostate
- Trauma- Iatrogenic, External
- STone - KUB
- Infection - Tuberculosis, Filaria, Nonspecific
- Vascular- Renal artery embolism, Thrombosis, AV fistula
- Congenital- Adult Polycystic Kidney, PUJ Obst.

Causes



Blood dyscrasias
Purpura
Sickle cell trait
Anticoagulants

Renal tumours
Transitional cell carcinoma
Wilms' tumour

Infarct
Injury
Tuberculosis
Stone

Stone in ureter

Hypernephroma

Focal and glomerular nephritis

Neoplasm of ureter

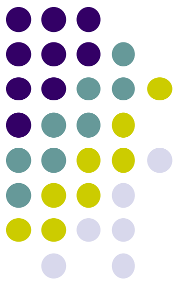
Bladder
Tuberculosis
Cystitis
Tumours
Bilharzia
Stone

Prostate
Benign
Malignant

Jogger's haematuria

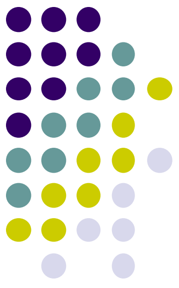
Urethral neoplasm

Investigation For Definitive Diagnosis



- **Urine Examination**
- **U/S**
- **IVU**
- **Cystoscopy , RGU , Ureteroscopy**
- **CT-** Multi Plane
- **MRI**
- **Renal Angiography**
- **PCN- Renoscopy**

Investigation of Choice for *Select* *conditions*



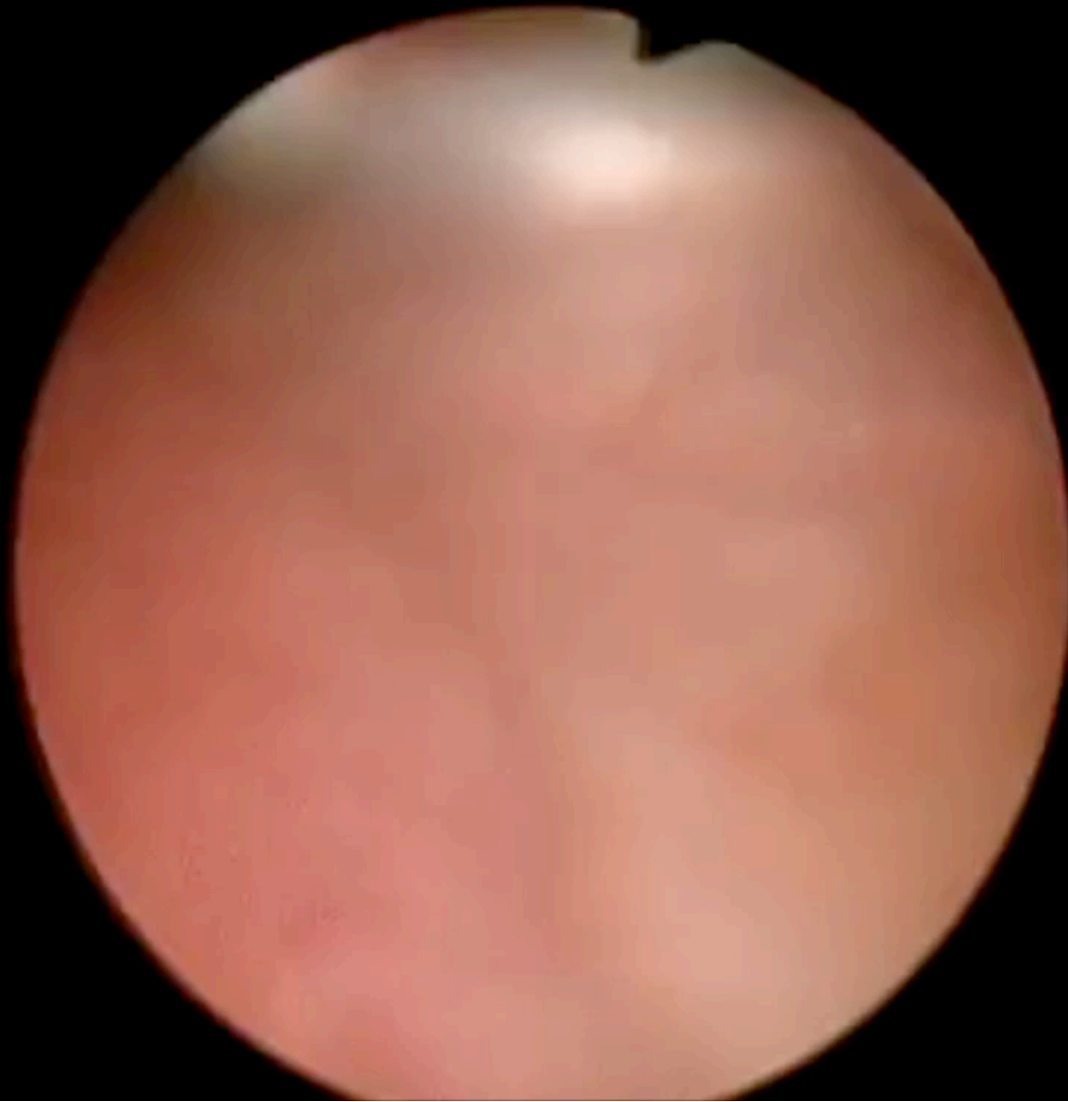
- **U/S** - Stone, Mass
- **CECT** - RCC, Poly Cystic Kidney ,Trauma
- **IVU ?-** TB ,TCC Upper tract ,
- **Cystoscopy –** Bladder Lesion
- **Ureteroscopy –** Ureter and calyx
- **Renal Angiography** -Vascular Causes

Cystoscopy

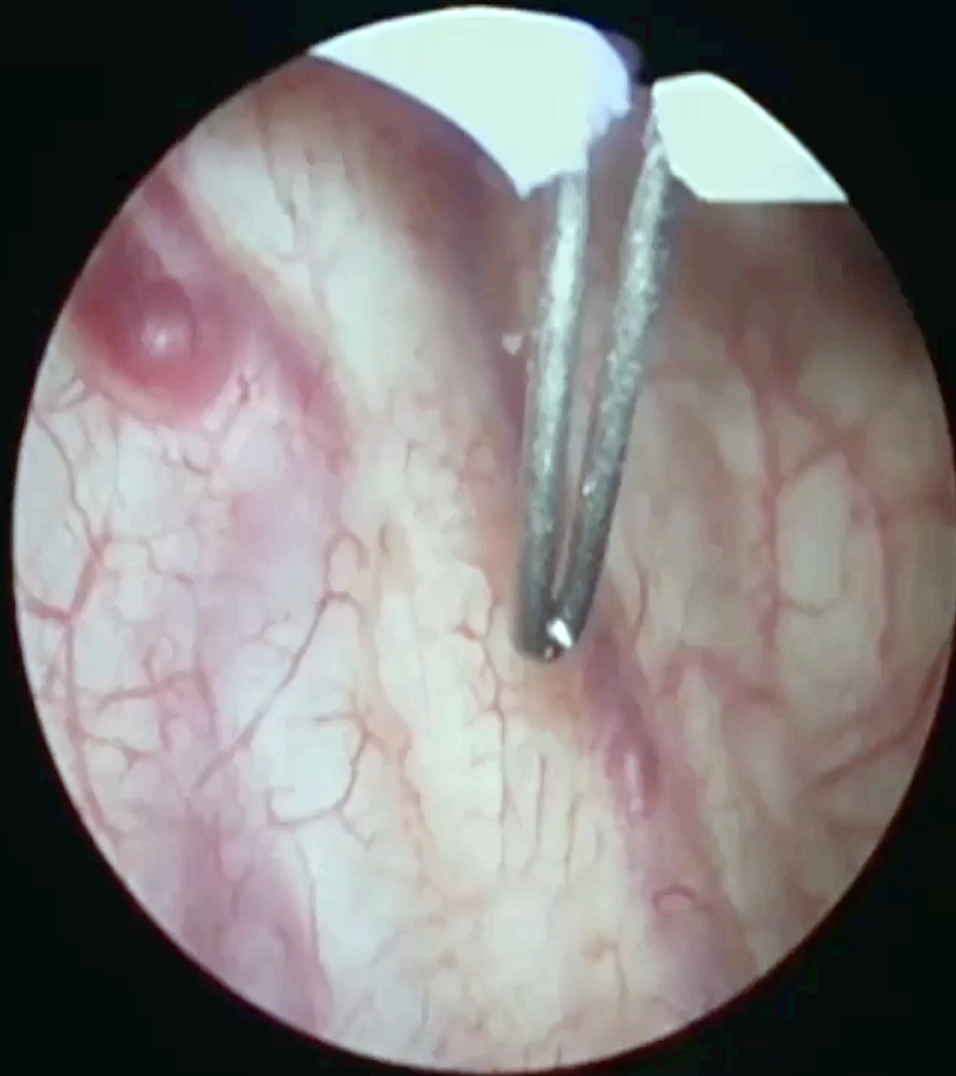
- Gold standard
- Complete visualization of urethral and bladder mucosa; allows biopsy/resection of any lesions
- Invasive
  - Can be performed with minimal discomfort with topical local anesthesia in the urethra
- Standard schedule (q3–4mo) not based on clinical validation
- Expensive
- Sensitivity: 73%; specificity: 68.5%[1]
  - Can be enhanced to 97% sensitivity with 5-aminolevulinic acid–induced fluorescence,[1] but not widely practiced

Kriegmair M, et al. *J Urol*. 1996;155:105.

TURBT



Bladder Tumor



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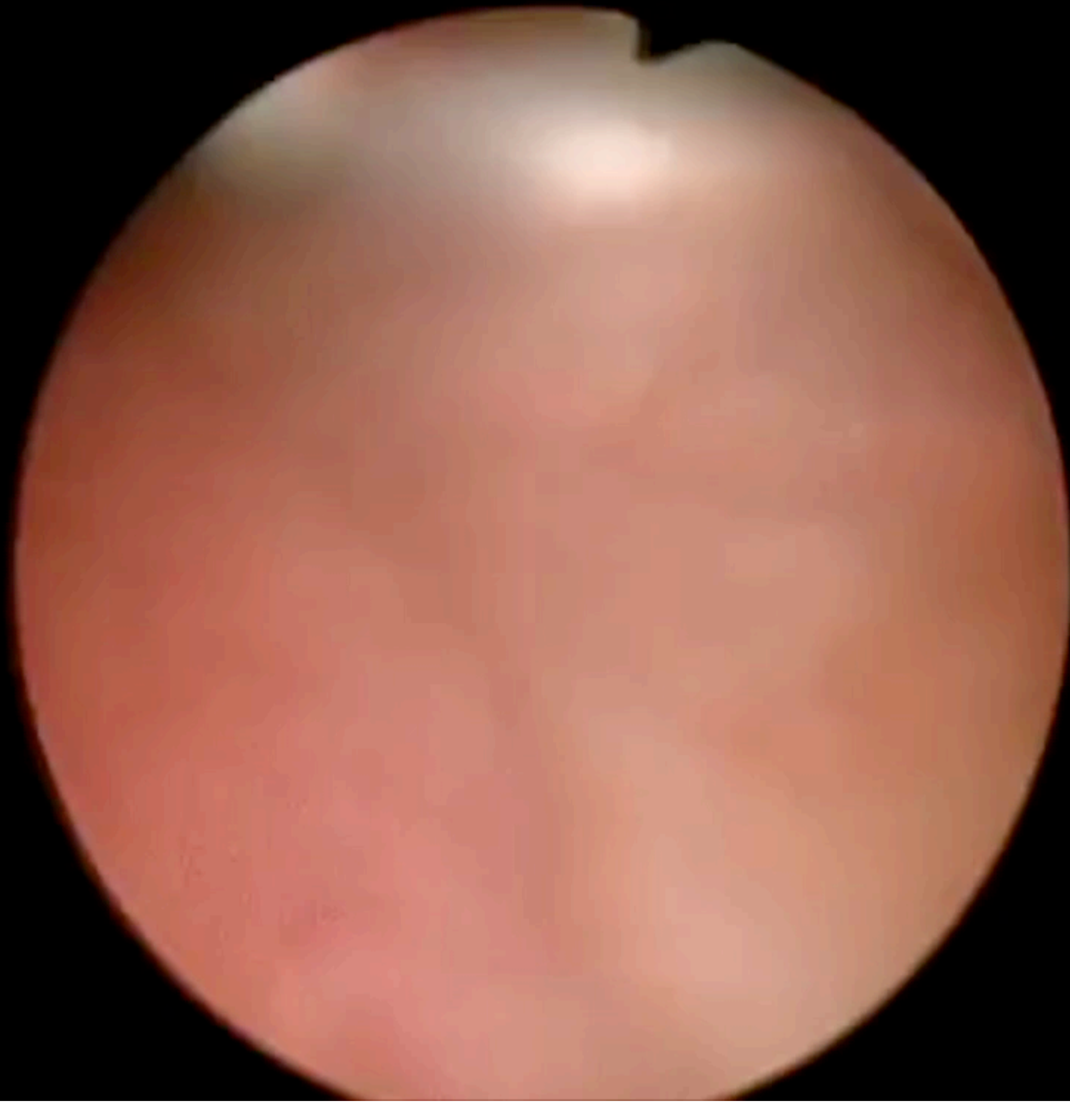
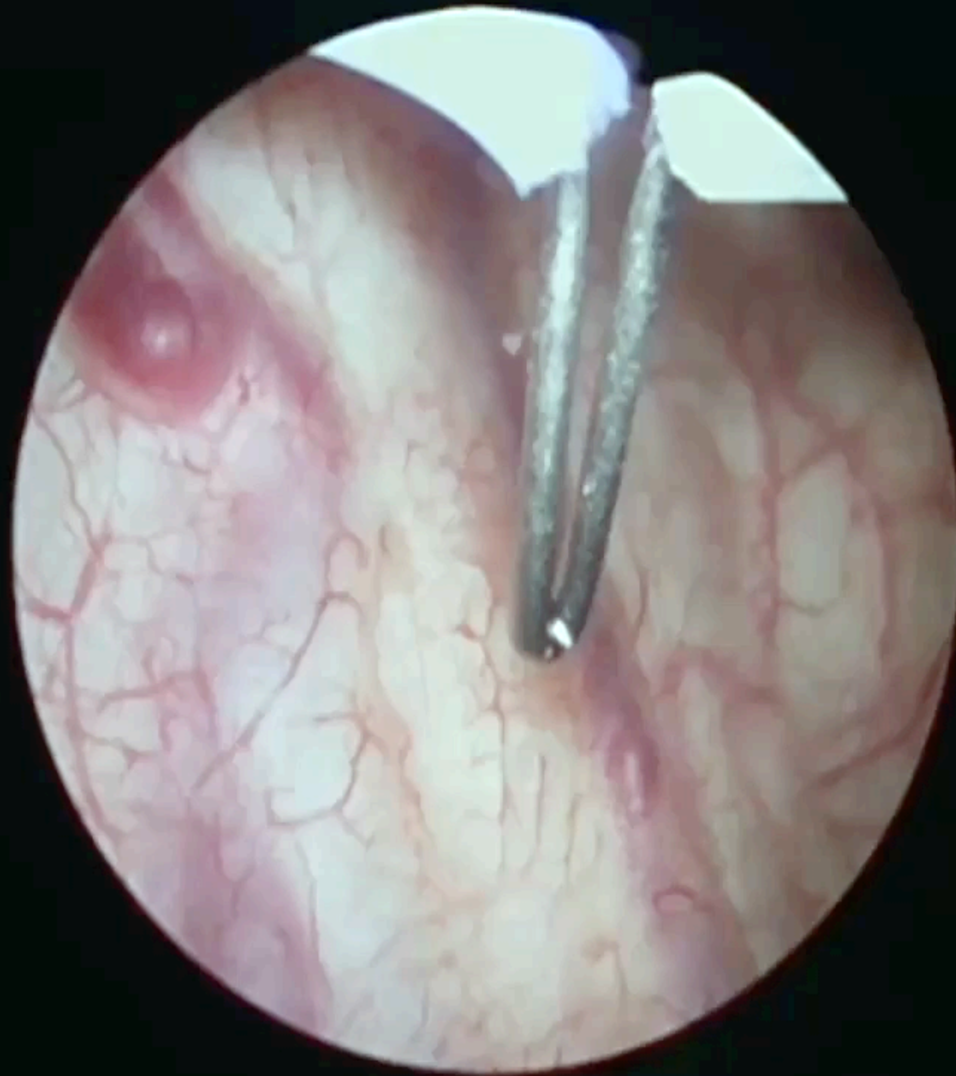
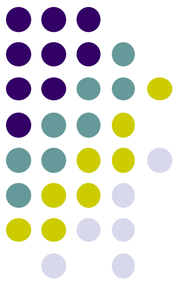


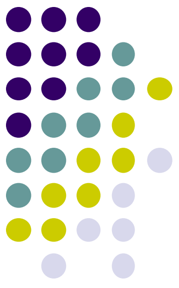
Bladder Tumor



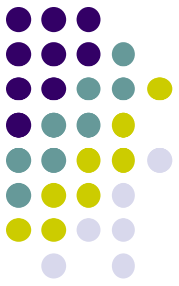
Cystoscopy

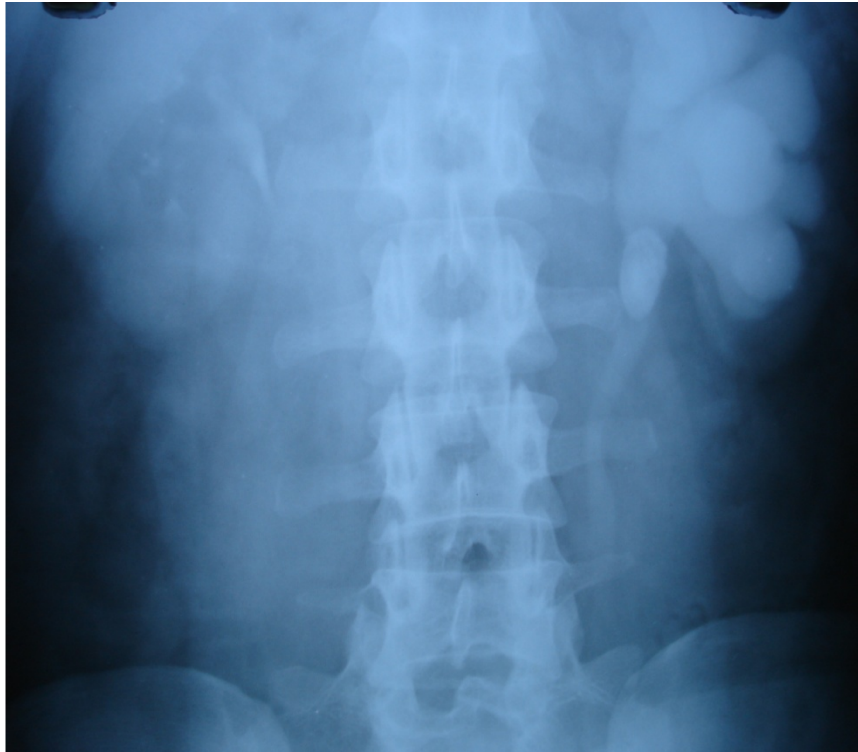


U/S

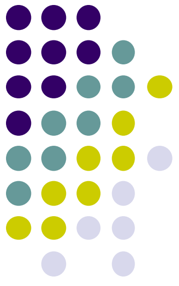


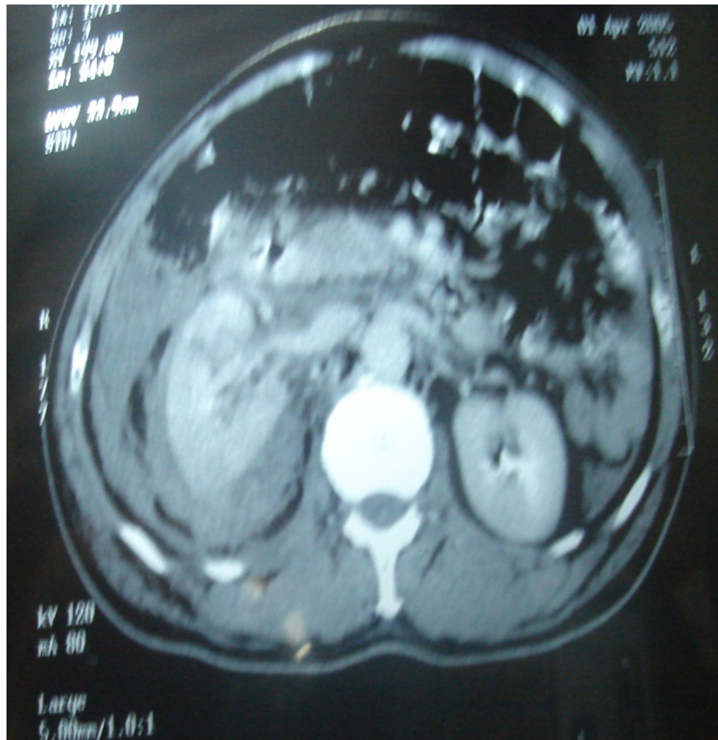
IVU

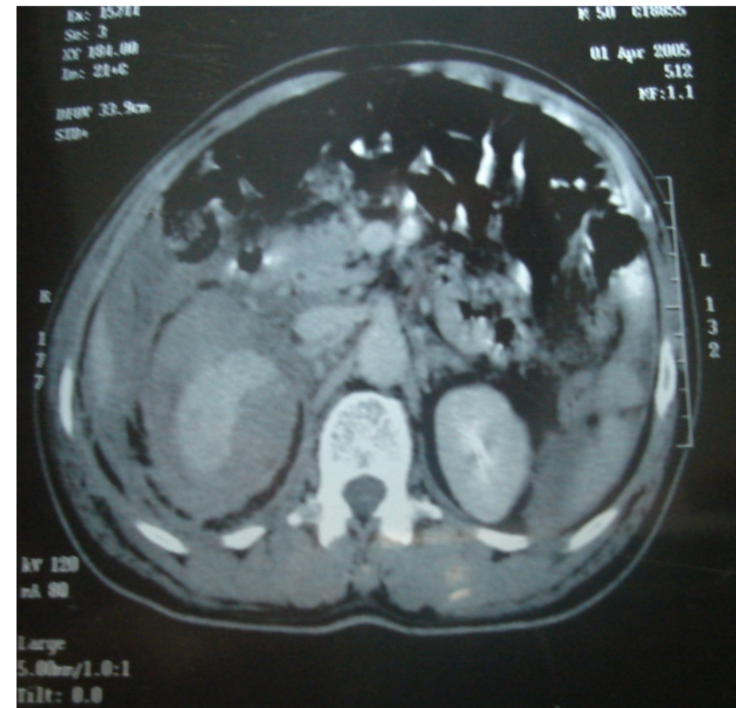




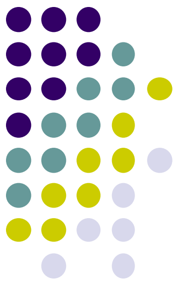
CT :







Evaluation of Symptomatic Haematuria



Detection of Microscopic hematuria
>5RBC/hpf or +ve dipstik test

↓

Exclude benign causes :
Menstruating women
Women with UTI
False +ve result
Recent strenous exercise
Sexual activity, viral illness,trauma etc

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Primary care investigation
History
Examination
Renal function
Urine microscopy and culture

↓

Proteinuria
Red cell cast/dysmorphic red blood cells
Renal Impairment

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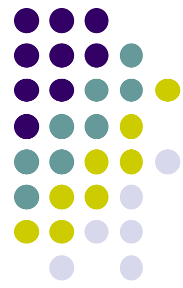
Nephrological referral

Isolated microscopic haematuria and age >40 years

↓

Consider Urological referral

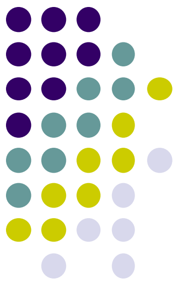
Urological Management Algorithm



U/S
↓
IVU
↓

- Normal
  - Cytology
  - Cystoscopy
    - Normal → C.T.
      - N
      - Mass
    - Bladder Tumor
    - Lateralized Grass Hema. → RGU, Upper Tract Cyto. → U/S, CT → Renal angiography
- Abnormal
  - Renal Mass
  - Stone
  - Filling Defect → RGU → Cytology, Brush Biopsy → Ureteroscopy

Take Home



- Confirm Hematuria

  Positive Dipsticks for blood should get microscopic confirmation

  R/O Urethral Bleeding

- Assessment and Initial Management :

  Resuscitation & Control Bleeding

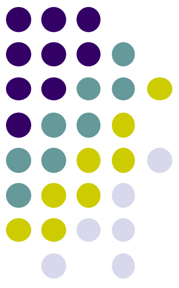
- Beware of Causes : Establish diagnosis

  Top 3 Suspects are: **I**nfection**, S**tones **and T**umor**.**

  Proper evaluation to establish cause & site of Bleeding is always mandatory

- Cure –Definitive Treatment of Disease

References



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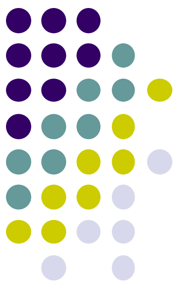
Still Expecting lot ……….



THANK YOU