Microhematuria

Diagnosis, Evaluation and Follow-up
Dr. Christopher Moyer
Urology of Central PA

- Born Reading, PA
- BS Biology – Albright College
  - Medical School – PCOM
  - Urology Residency –
    - Albert Einstein, Philadelphia, PA
- Additional training Cleveland Clinic
- Practicing urology in central PA
  - Since 2001
- Special interests in robotics
Microhematuria

- Definition – 3 or greater RBC’s per HPF in absence of an obvious benign cause

- Positive dipstick does not define it
Microhematuria

- Assessment
  - history
  - physical exam
  - labs
- Above is used to rule out benign causes
  - infection
  - menstruation
  - vigorous exercise
  - medical renal disease
  - viral illness
  - trauma
  - recent urological procedures
Microhematuria

- Once a benign cause has been ruled out, a further workup is mandatory
  - Risk of detecting a malignancy
    - 1%–26%
  - Overall risk of a malignancy was 3.6%
Microhematuria

- Etiologies–clinically significant
- GU malignancies–renal/ureteral/bladder/prostatic/urethral
- Stones–renal/ureteral/bladder
- Stricture disease
- Medical renal disease
- BPH–benign prostatic hyperplasia
Microhematuria

- Urinary System
Microhematuria

- GU Malignancies
  - renal–renal cell CA/TCC renal pelvis
  - ureteral–TCC
  - bladder–TCC/squamous/adenocA
  - prostate–adenocA
  - urethral–squamous/TCC/adenocA
Microhematuria

- Risk factors for GU malignancies in patients with microhematuria
  - male
  - age > 35
  - past or current smoking
  - exposure to chemicals/dyes
  - benzenes/aromatic amines
  - analgesic abuse
  - irritative voiding symptoms
  - pelvic irradiation
  - chronic UTI’s
  - chronic indwelling foreign body
Microhematuria

- Kidney cancer
Microhematuria

- Ureteral cancer
Microhematuria

- Bladder Cancer
Microhematuria

- Prostate cancer
Microhematuria

- Stone Disease
- Types of stones
  - calcium
  - uric acid
  - struvite–infectious
  - cysteine
Microhematuria

> Renal Stones
Microhematuria

- Ureteral stones
Microhematuria

- Bladder stones
Medical renal disease
Nephropathies
obstruction
IgA
Nephritis
Presence of casts, proteins, dysmorphic red cells suggest this type of etiology
Microhematuria

Diagnosis, Evaluation and Follow-up of AMH

+AMH
(≥ 3 RBC per HPF on UA with microscopy)

Repeat UA after treatment of other cause(s)

History & Physical Assess for other potential AMH causes
(e.g., infection, menstruation, recent urologic procedures)

Release from care

Concurrent nephrologic work up if proteinuria, red cell morphology or other signs indicate nephrologic causes.

Renal Function Testing Cystoscopy Imaging (CTU)

Treatment

Follow up with at least one UA/micro yearly for at least two years

Follow persistent MH with annual UA. Consider nephrologic evaluation. Repeat anatomic evaluation within three to five years* or sooner, if clinically indicated.

If unable to undergo CTU, less optimal imaging options include:
- MR Urogram
- Retrograde pyelograms in combination with non-contrast CT, MRI, or US

Follow up as indicated by diagnosis. Re-evaluate for MH after resolution of identified condition.

Release from care

*The threshold for re-evaluation should take into account patient risk factors for urological pathological conditions such as malignancy.

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Microhematuria

- Initial work-up
  - renal function testing
  - cystoscopy
  - Imaging—CT urogram
Microhematuria

- Cystoscopy
- should be performed on all pts. 35 or older
- under 35 at drs. discretion
Microhematuria

Imaging

CT urogram is most sensitive study to rule out a significant cause—renal lesion or uppertract lesion

It will help lower need to order additional studies
Microhematuria

- CT urogram
- Without and with iv contrast in addition to delayed films
Microhematuria

- Other imaging modalities
  - MR urogram
  - Ultrasound
  - Retrograde pyelogram in combination with non-contrast CT/ultrasound/MRI
  - IVP

- None of these are as sensitive or specific in detecting a significant cause of microhematuria
Microhematuria

- Ultrasound
Microhematuria

MRI
Microhematuria

- Imaging Modalities

- If CT cannot be done—renal insufficiency/contrast allergy/pregnancy than MR urogram or ultrasound is an acceptable option
Microhematuria

- Urinary markers
  - cytology
  - NMP–22
  - BTA–stat
  - FISH
  - CX bladder

- Use of these tests are not recommended as part of the routine evaluation
- There are exceptions—pt with irritative symptoms, smokers, chemical exposure may benefit from cytology
Followup – original work-up neg
rec yearly UA’s–if hematuria worsens then repeat eval
if 2 yearly UA’s are neg then no further UA’s needed for eval of hematuria
if yearly UA’s show persistent hematuria(quantitatively no change) rec to repeat eval in 3–5 years
Microhematuria

Diagnosis, Evaluation and Follow-up of AMH

1. +AMH (≥ 3 RBC per HPF on UA with microscopy)
   - History & Physical Assess for other potential AMH causes (e.g., infection, menstruation, recent urologic procedures)
   - Concurrent nephrologic work up if proteinuria, red cell morphology or other signs indicate nephrologic causes.
   - Renal Function Testing Cystoscopy Imaging (CTU)
   - Treatment
   - Follow up with at least one UA/micro yearly for at least two years
   - If unable to undergo CTU, less optimal imaging options include:
     - MR Urogram
     - Retrograde pyelograms in combination with non-contrast CT, MRI, or US
   - Follow persistent MH with annual UA. Consider nephrologic evaluation. Repeat anatomic evaluation within three to five years* or sooner, if clinically indicated.

2. Repeat UA after treatment of other cause(s)
   - Release from care
   - If negative, continue treatment.
   - Release from care

3. Release from care

*The threshold for re-evaluation should take into account patient risk factors for urological pathological conditions such as malignancy.