

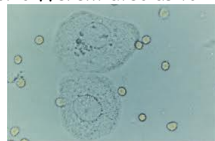
Urinalysis and Body Fluids CP9

Unit 2; Session 4

Epithelial Cells
in the Urine Microscopic

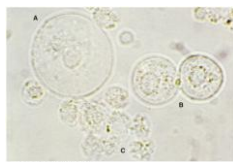
Microscopic Sediment - Epithelial Cells

- Epithelial Cells
 - Cells sloughed from the kidney, urethra, bladder and genital track.
 - Unless increased in number or abnormal forms, they are normal part of sediment.
 - May be reported as present or differentiated as to types.



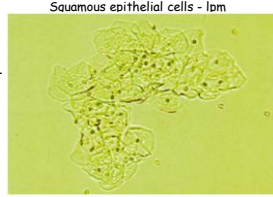
Microscopic Sediment - Epithelial Cells

- Epithelial Cells
 - Three major types
 - Classified according to site of origin
 - Squamous
 - Transitional
 - Renal tubular.



Microscopic Sediment - Epithelial Cells

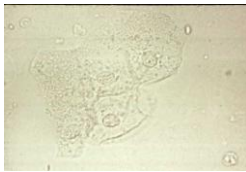
- Squamous epithelial cells
 - Physically the largest.
 - Small centrally located nucleus
 - Abundant cytoplasm
 - May be rolled-up or folded and appear to be casts.
- Easy to see under lpm.
- Origins
 - Lower part of urethra
 - Female vagina.
 - Specimen contaminant



Microscopic Sediment - Epithelial Cells

- Squamous epithelial cells
 - Report as average number seen / lpf.
 - See [Urinalysis Reporting Standardization Guide](#)

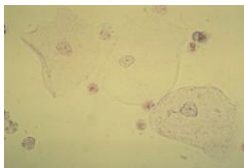
Unstained squamous epithelial cells / lpf



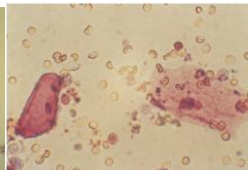
Microscopic Sediment - Epithelial Cells

- Squamous epithelial cells - (stained with Sternheimer-Malbin)

Sternheimer Malbin -stained RBCs, WBCs, and Squamous epithelial cells

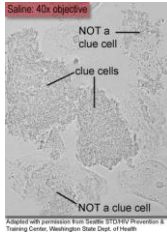
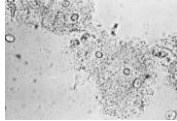


Sternheimer Malbin -stained RBCs, WBCs, and Squamous epithelial cells



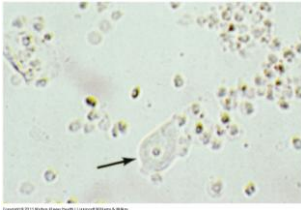
Microscopic Sediment - Epithelial Cells

- Squamous epithelial cells
- Clue cells - squamous epithelial cells with *Gardnerella vaginalis* bacteria colonizing the cell - a sign of vaginal infection.
- Wet prep specimen of vaginal scrapings / washings are most often used in diagnosis.
- Urine specimen may also demonstrate clue cells.



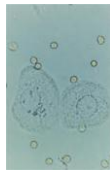
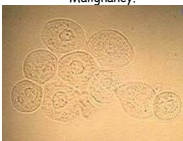
Microscopic Sediment - Epithelial Cells

- Transitional epithelial cells
- Line urinary track from renal pelvis to upper portion of the urethra.



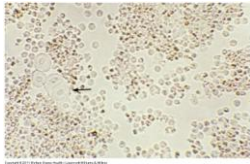
Microscopic Sediment - Epithelial Cells

- Transitional epithelial cells
- Normally present in low numbers.
- Shape depends on origin
 - Spherical, polyhedral and caudate are terms describing shapes.
- All have distinct centrally located nuclei.
- Can be seen in clumps called syncytia.
 - Catheterization
 - Malignancy.



Microscopic Sediment - Epithelial Cells

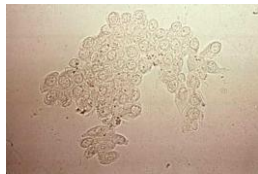
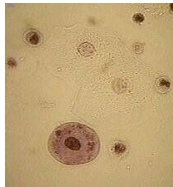
- Transitional epithelial cells



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Microscopic Sediment - Epithelial Cells

- Transitional epithelial cells
- Report as average number / hpf
 - On left, squamous and transitional cells, hpf, Toluidine blue stain.



Microscopic Sediment - Epithelial Cells

- Renal Tubular Epithelial Cells (RTEs)
 - Line the tubules of the nephron
 - Shape varies
 - Depending on exact origin
 - They may be flat, cuboidal, or columnar.
 - Larger than leukocytes
 - Contain a large round nucleus



Microscopic Sediment - Epithelial Cells

- Renal Tubular Epithelial Cells (RTEs)
 - Most significant of the epithelial cells
 - Increased numbers of tubular epithelial cells suggest tubular damage:
 - Glomerulonephritis, Acute tubular necrosis,
 - Salicylate intoxication, heavy metal poisoning, diethylene glycol (antifreeze) poisoning,
 - Kidney transplant rejection, some viral infections
 - Can absorb pigments such as hemoglobin & bilirubin
 - Can contain vacuoles
 - Non-lipid vacuoles = bubble cells
 - Lipid vacuoles - oval fat bodies

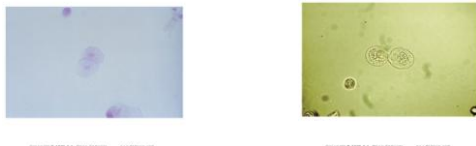
Microscopic Sediment - Epithelial Cells

- Renal tubular epithelial cell types
 - Proximal tubular renal epithelial cells
 - Rarely found
 - Largest of the RTEs
 - Round eccentric nucleus, granular cytoplasm, may have brushy border.
 - Their long trip from the proximal tubule usually results in cell degrading (may explain why cytoplasm gets granular).
 - Columnar in shape and may look like small casts
 - Pictures are hpf magnification.



Microscopic Sediment - Epithelial Cells

- Renal tubular epithelial cell types
 - Distal tubular epithelial cells
 - Smaller, round to oval shaped
 - May resemble WBCs, or spherical transitional cells
 - Round eccentric nucleus, granular cytoplasm, may have brushy border.
 - Pictures are hpf magnification.



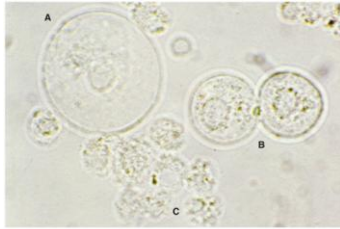
Microscopic Sediment - Epithelial Cells

- Renal tubular epithelial cell types
 - Collecting duct epithelial cells
 - Cuboidal, never round
 - At least one straight edge
 - Eccentric nucleus
 - Three or more cells in clump is renal fragment; often large sheets
 - Proximal and distal RTEs do not do this.
 - Pictures are hpf magnification



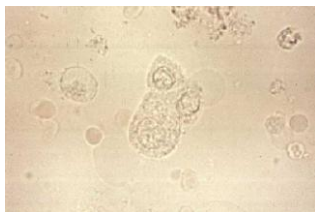
Microscopic Sediment - Epithelial Cells

- Transitional cell (A), Renal epithelial cells (B) and WBCs (C).



Microscopic Sediment - Epithelial Cells

- RTEs; 250x magnification
- Also WBC and RBCs



References

- > Lillian Mundt & Kristy Shanahan, Graff's Textbook of Urinalysis and Body Fluids, 2nd Ed.
- > Susan Strassinger & Marjorie Di Lorenzo, Urinalysis and Body Fluids, 5th Ed.
- > Mery Haber, MD, A Primer of Microscopic Urinalysis, 2nd Ed.
- > Zenggang Pan, MD, PhD., Dept of Pathology, U of Alabama at Birmingham
 - > <http://www.enjoypath.com/cp/Chem/Urine-Morphology/Urine-morphology.htm>
- > Department of the Army, Landstuhl Regional Medical Center
 - > <http://www.dcss.cs.amedd.army.mil/field/FLIP%20Disk%204.2/FLIP42.html>
- > Seattle STD/HIV Prevention & Training Center, Washington State Dept. of Health (clue cells)
