



Medical Laboratory Techniques Department

Microscopic examination of urine

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* Requirements:

- 1-Centrifuge tube or test tube
- 2-Glass slide
- 3-Coverslips
- 4-Pasteur pipettes
- 5-Centrifuge
- 6-Microscope
- 7-Sample

*Principle:

The microscopic elements present in urine are collected in the form of deposit by centrifugation .A small drop of the sediments poured on a glass slide , a cover slip is place over it and observed under microscope.

A variety of normal and abnormal cellular elements

- 1-Red blood cells or Erythrocytes (RBCs)
- 2-White blood cells (WBCs)
- 3-Mucus
- 4-Different types of epithelial cells
- 5-Different types of Crystals

6-Casts

7-Bacteria

8-Fungi

9-Parasite

10-Artifacts

1-Red blood cells or Erythrocytes (RBCs)

•Hematuria is the presence of abnormal numbers of red cells in urine due to any of several possible causes:

a)Glomerular damage

b) Kidney trauma

c) Urinary tract stones

d) Urinary tract infections

e) Physical stress

In fresh urine these cells have a normal ,pale or yellow appearance ,they do not contain nuclei .



2-White blood cells (WBCs)

•Pyuria refers to the presence of abnormal numbers of WBCs that may appear with infection in the urinary tract



WBCs have lobed nuclei and granular cytoplasm

3-Mucus

- A protein material produced by the glands and epithelial cells of lower genitourinary tract and the renal tubular epithelial (RTE)



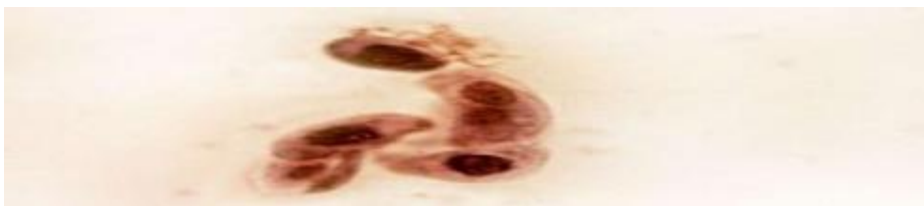
4-Different types of epithelial cells

A-Squamous epithelial cells



These are large ,flat and irregular in shape and contain abundant cytoplasm and small central nuclei

B-Transitional epithelial cells



-They may be pear shaped or round

C-Tubular epithelial cells

-They may be round shaped or egg-shaped



These cells may contain a large round or oval nucleus

5-Different types of Crystals

*Formed by precipitation of urinary salts when alteration in multiple factors affect their solubility like pH , temperature and concentration

•Crystals found in acidic urine

1-Calciumoxalate 2-Uric acid 3-Amorphousurate 4-Sodiumurate

5-Calcium sulphate 6-Cystine 7-Tyrosine

1-Calciumoxalate

-These are colorless and envelop shaped

-These can be present in urine after the ingestion of tomatoes ,Oranges and Vitamin C

-Can cause extensive tubular injury



2-Uric acid

-Appear mostly as diamond rhombic or rosette form

-Increase amount are associated with increase levels of purine and nucleic acids,
also, in patients with leukemia receiving therapy



3-Amorphousurate

-Pink to red dust , they do not form a crystalline



4-Sodiumurate

-These are in the form of elongated prisms or plates



5-Calciumsulphate

-These are long ,thin needle arranged in star-like manner



6-Cystine

-These are hexagonal plates with equal or unequal sides



7-Tyrosine

-These appear in the form of fine, needles that forms rosettes

