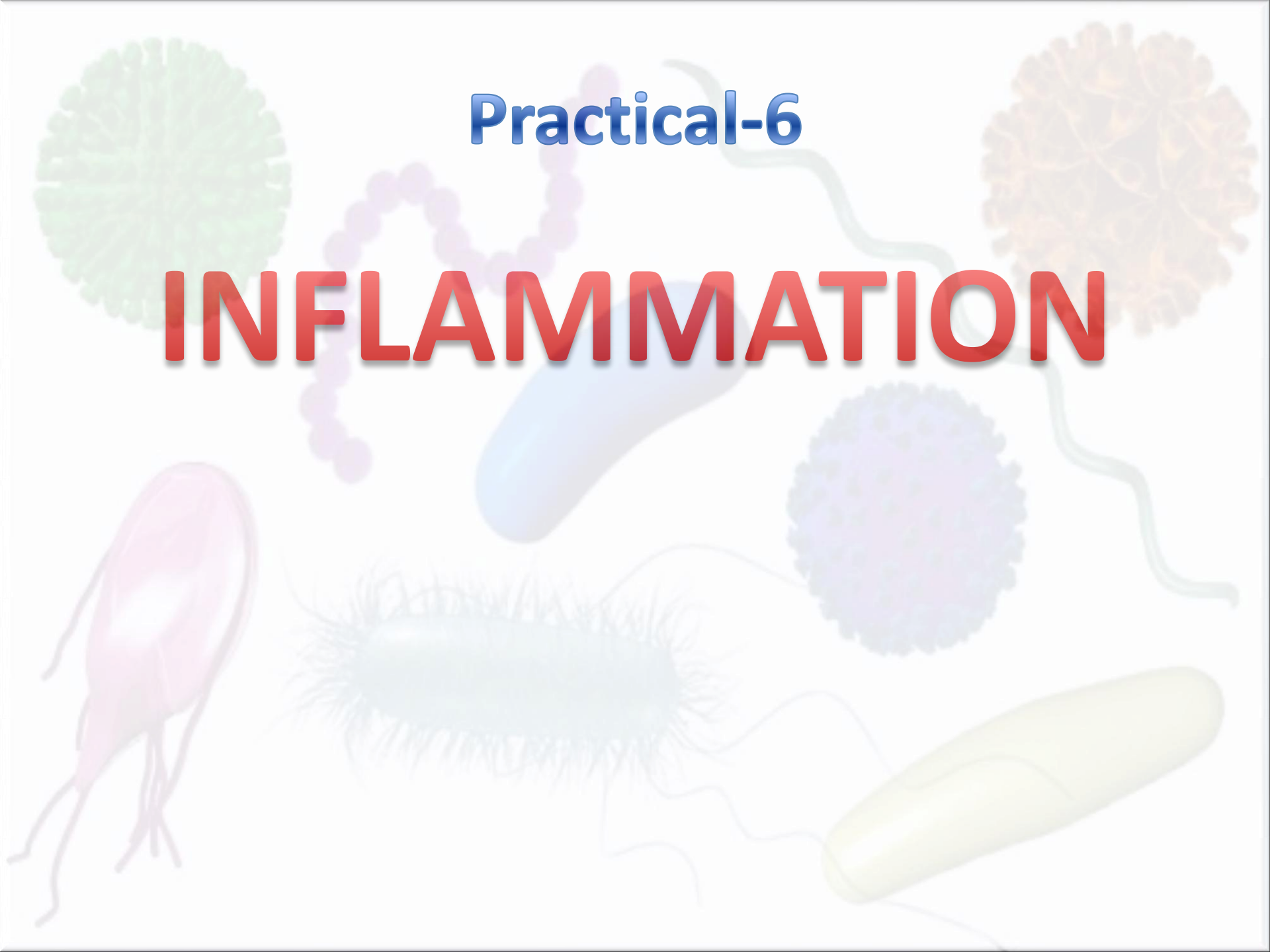


Practical-6

INFLAMMATION



***INFLAMMATION**

- The presence of infection in the female genital tract may procure certain cellular changes in the epithelium. Such changes are seen in **nucleus and cytoplasm surrounding the nucleus.**
- ***Thus, there is two types of changes:**
 - Cytoplasmic changes
 - Nuclear changes

***A- Cytoplasmic changes:**

1. Cytoplasmic vacuolization:

It is the presence of vacuoles within the cytoplasm which indicate degenerative changes (death of cells) as a result of inflammation.

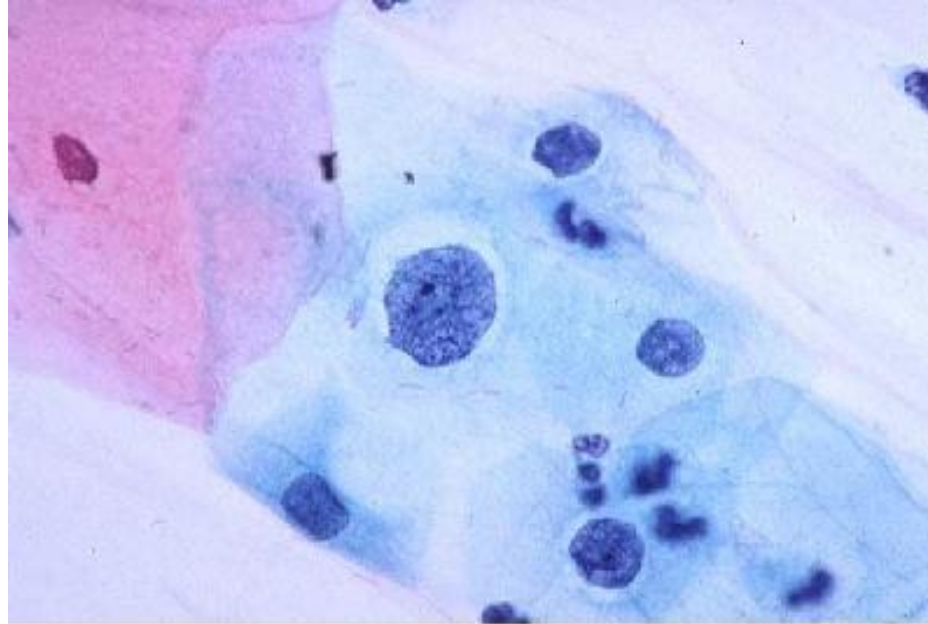
2. Variation in outline of the cells:

Size varies from small to a very large cell.

3. Peri nuclear halo:

The nucleus of degenerative cells are often surrounded by narrow clear zone (halos).

Peri nuclear halo

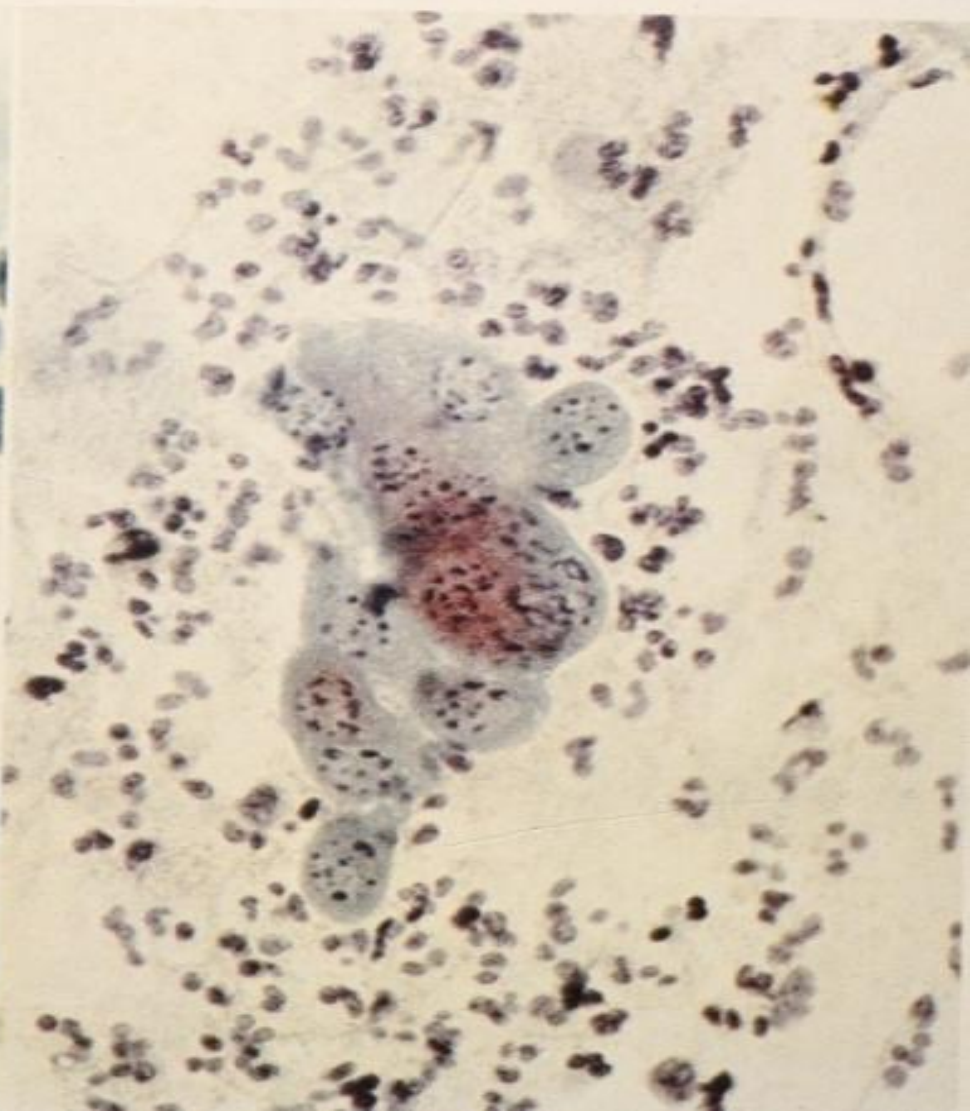
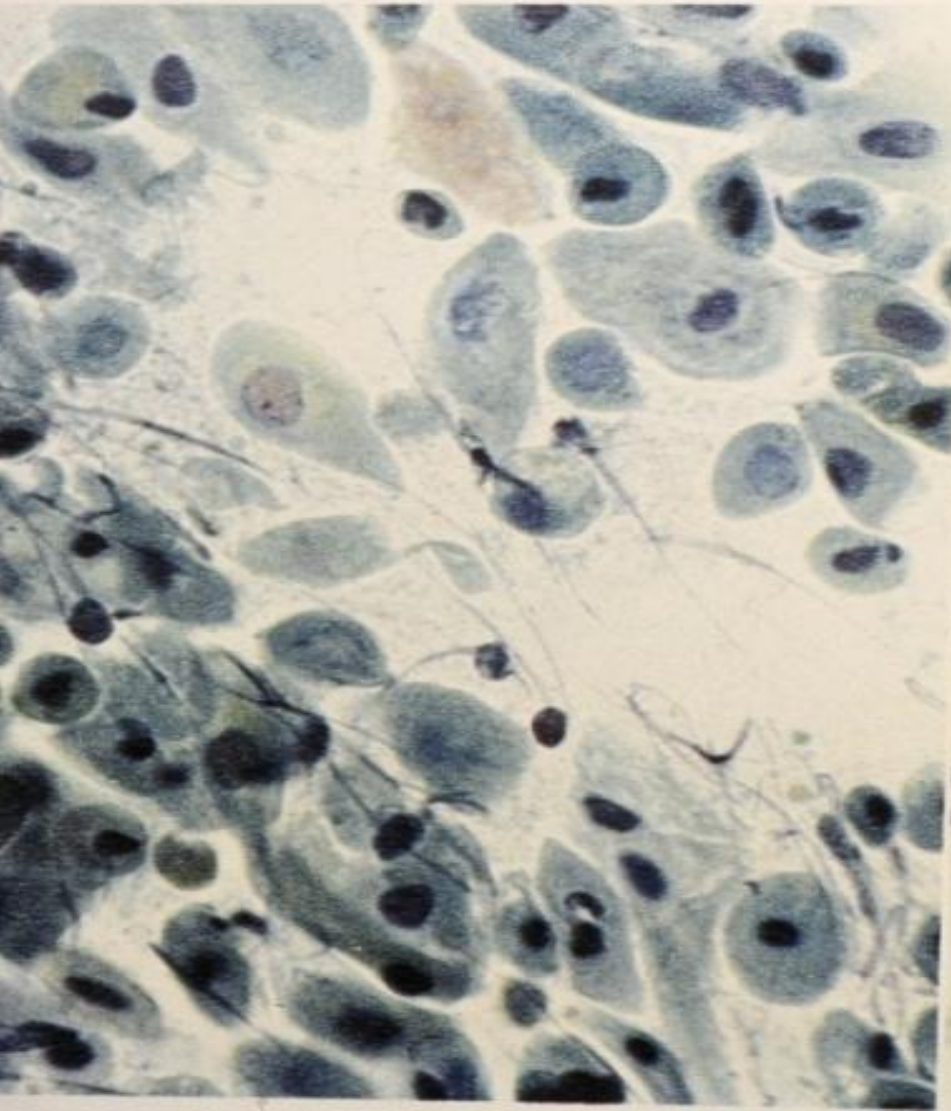


***B- Nuclear changes:**

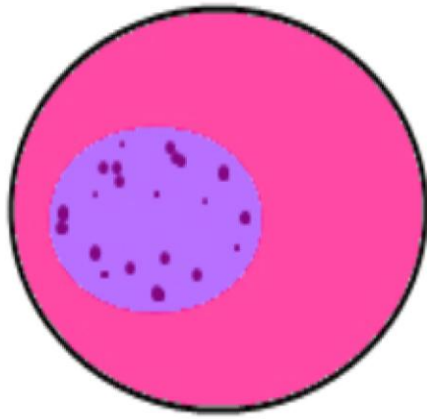
- 1. Nuclear enlargement and irregularity**, cell size will increase but not necessarily accompanied by hyperchromasia.
- 2. Multinucleation**.
- 3. Chromatin granulation**.
- 4. Pyknosis and karyorrhexis** (the fragmentation of the nucleus).
- 5. Karyolysis** (the nucleus become faint and lyses).

KARYOLYSIS *

*KARYORRHEXIS



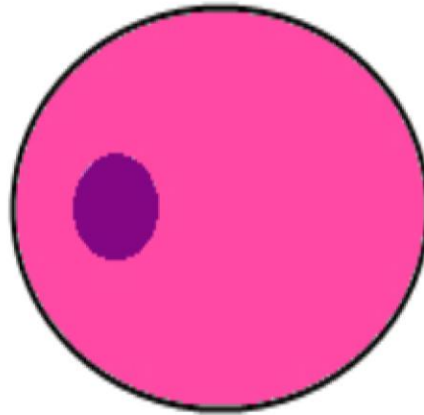
* KARYOLYSIS



Nuclear fading

chromatin dissolution due to action of DNAases & RNAases

PYKNOSIS



Nuclear shrinkage

DNA condenses into shrunken basophilic mass

KARYORRHEXIS



Nuclear fragmentation

Pyknotic nuclei membrane ruptures & nucleus undergoes fragmentation



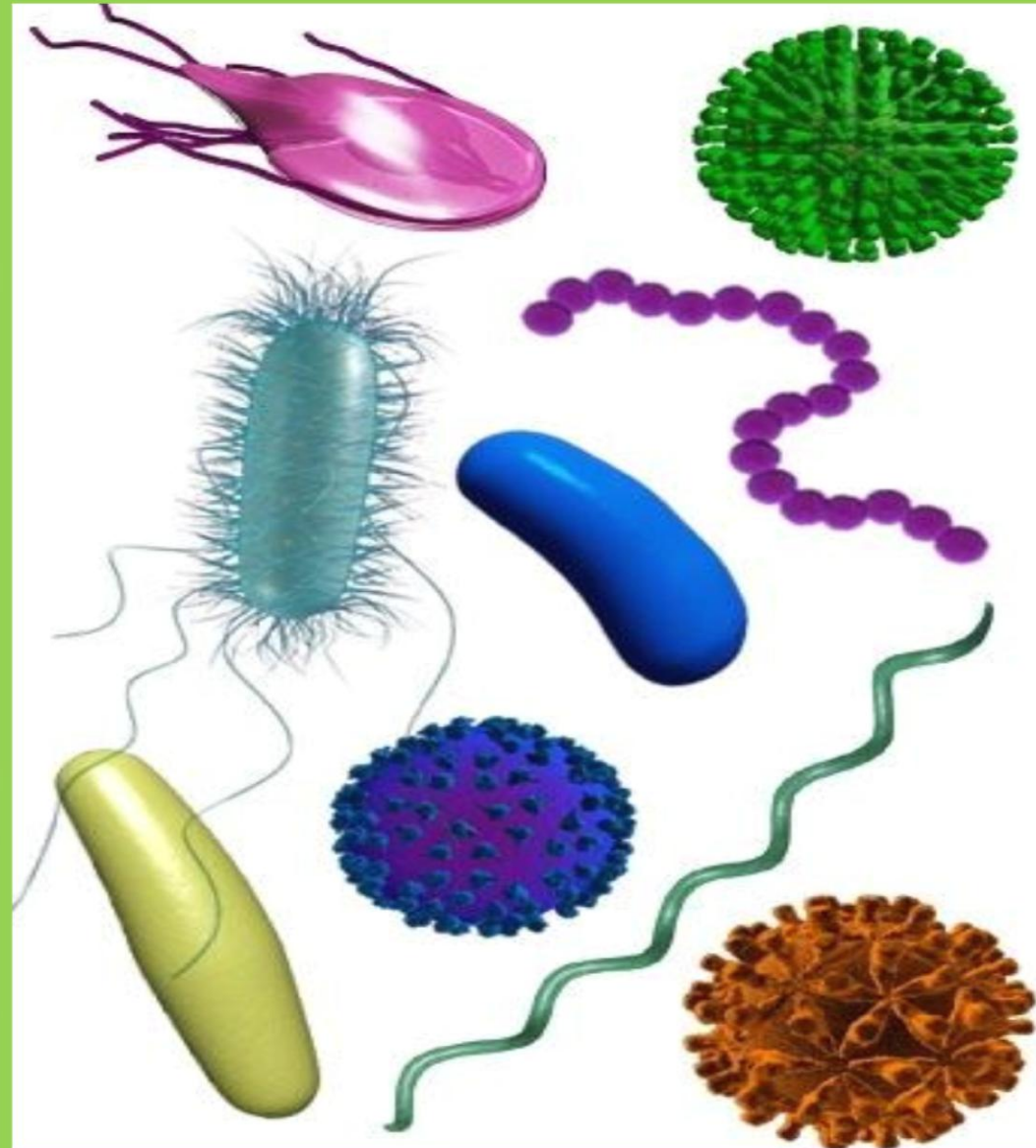
Nuclear dissolution



ANUCLEAR NECROTIC CELL

*THE COMMON CAUSES OF INFLAMMATION:

- **Bacteria**
- **Parasites**
- **Fungi**
- **Viruses**

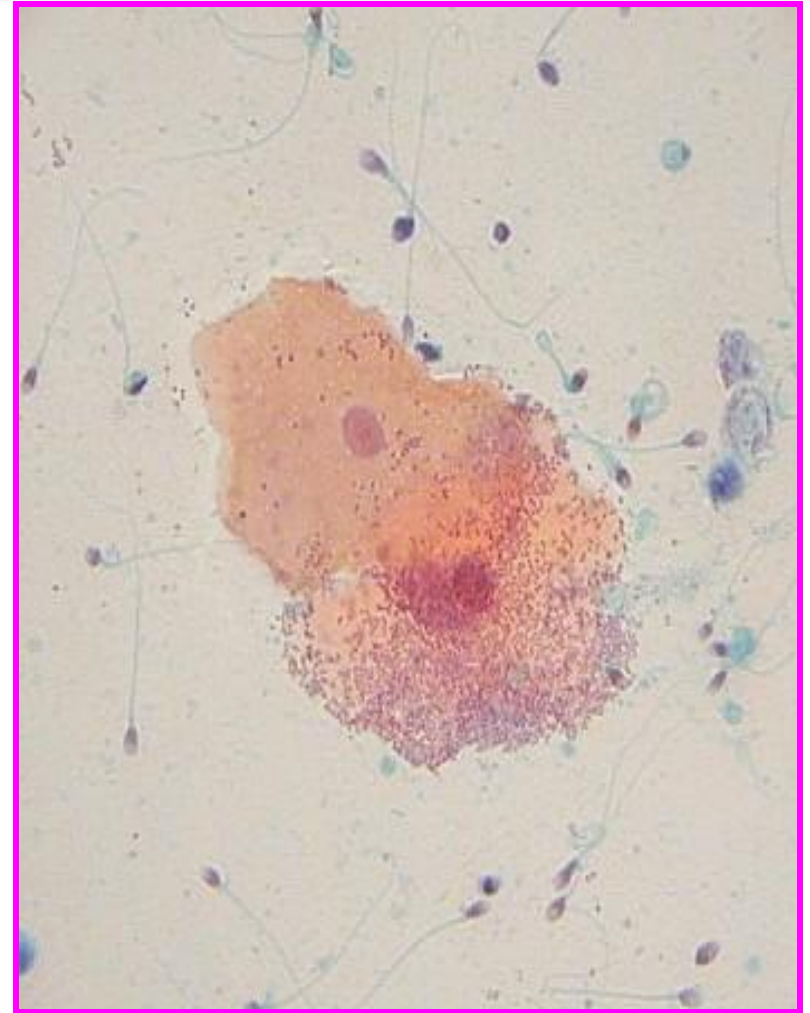
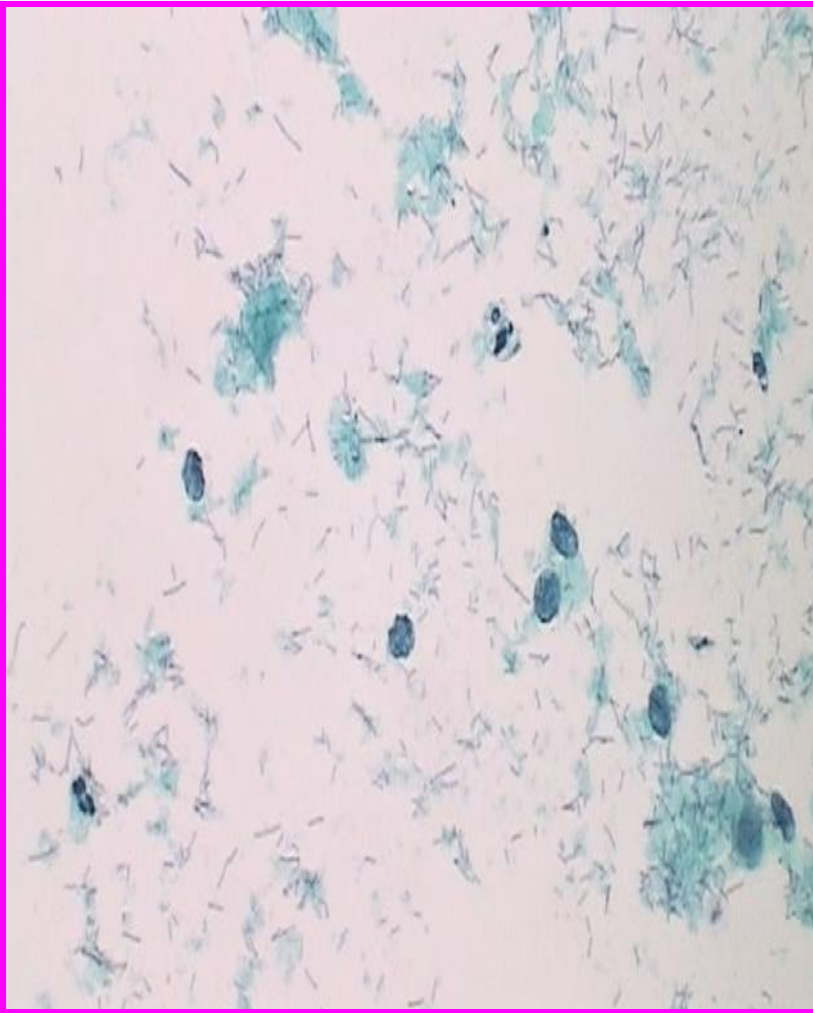


*Bacterial Infection

- Doderlein bacilli = lactobacillus = bacillus vaginalis these bacteria are considered to be vaginal normal flora, help maintaining the acidic ph. (3.5-4.5).
- These non-pathogenic bacteria may become pathogenic if the immune system of the host is weakened for any reasons.
- The 2 main changes are:
 - Cytolysis resulted from bacterial infection.
 - Clue cells which form by Coco bacilli

Cytolysis

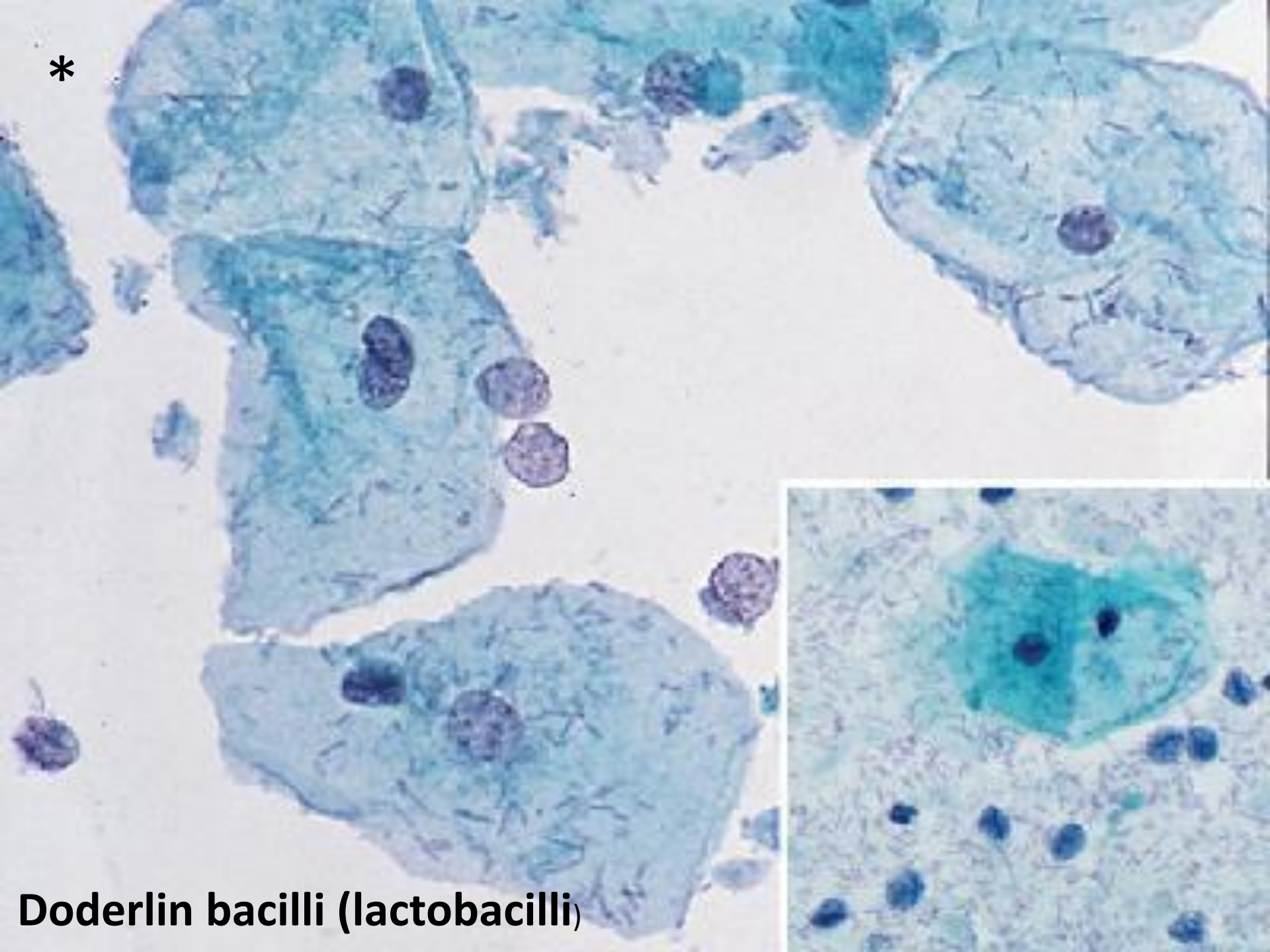
Cocobacilli & Sperms



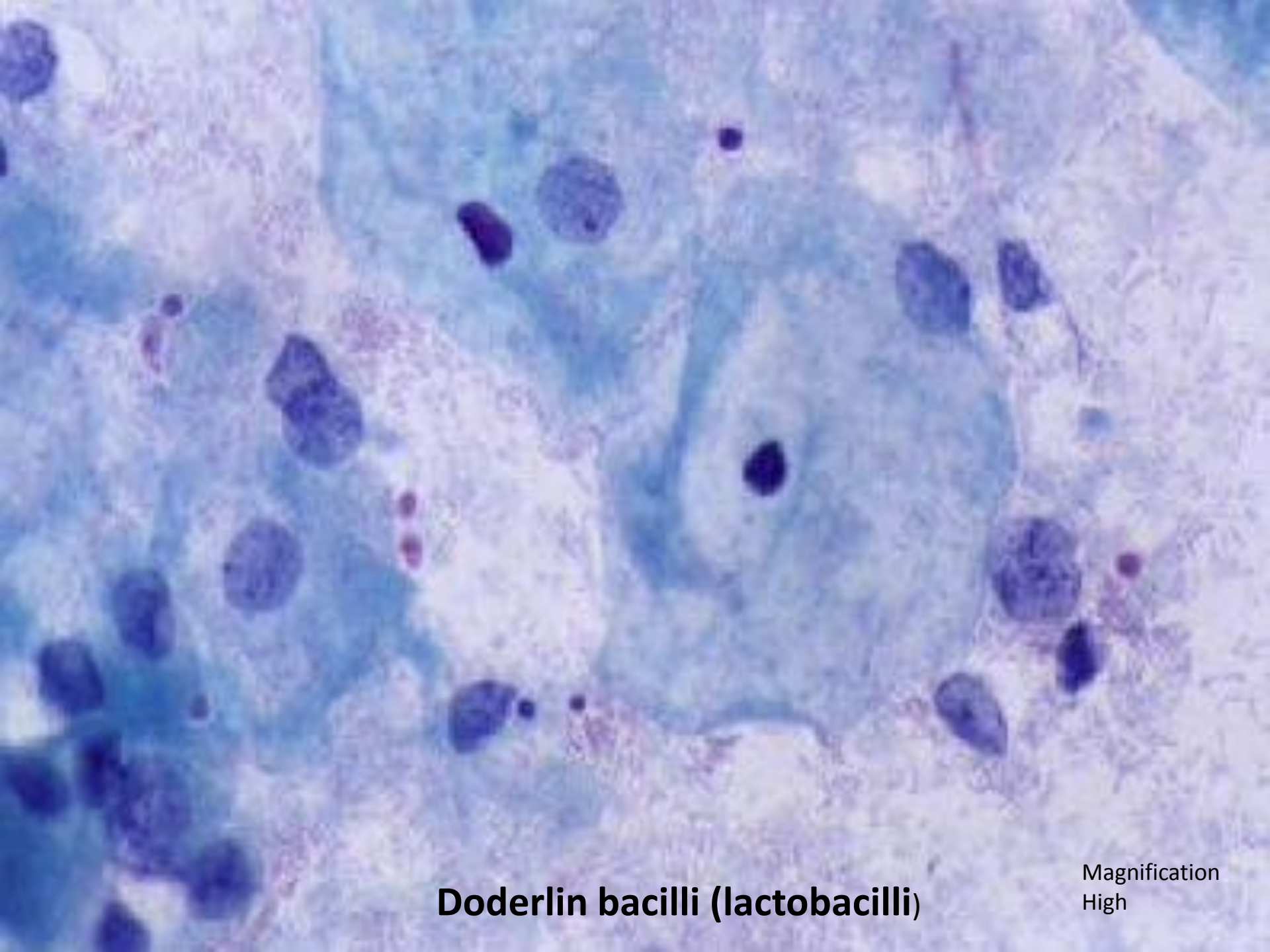
***1- Doderlein bacilli (lactobacilli)**

- **Lactobacilli (gram +ve rods) induced cytolytic vaginosis results from Lactobacillus overgrowth.**
- **LB is characterized by a transformation in the length of lactobacilli.**
- **The delicate balance of the vaginal ecosystem is challenged constantly by several factors such as hormonal changes, medications, intercourse, stress, infection, douching, and hygiene.**

*



Doderlin bacilli (lactobacilli)

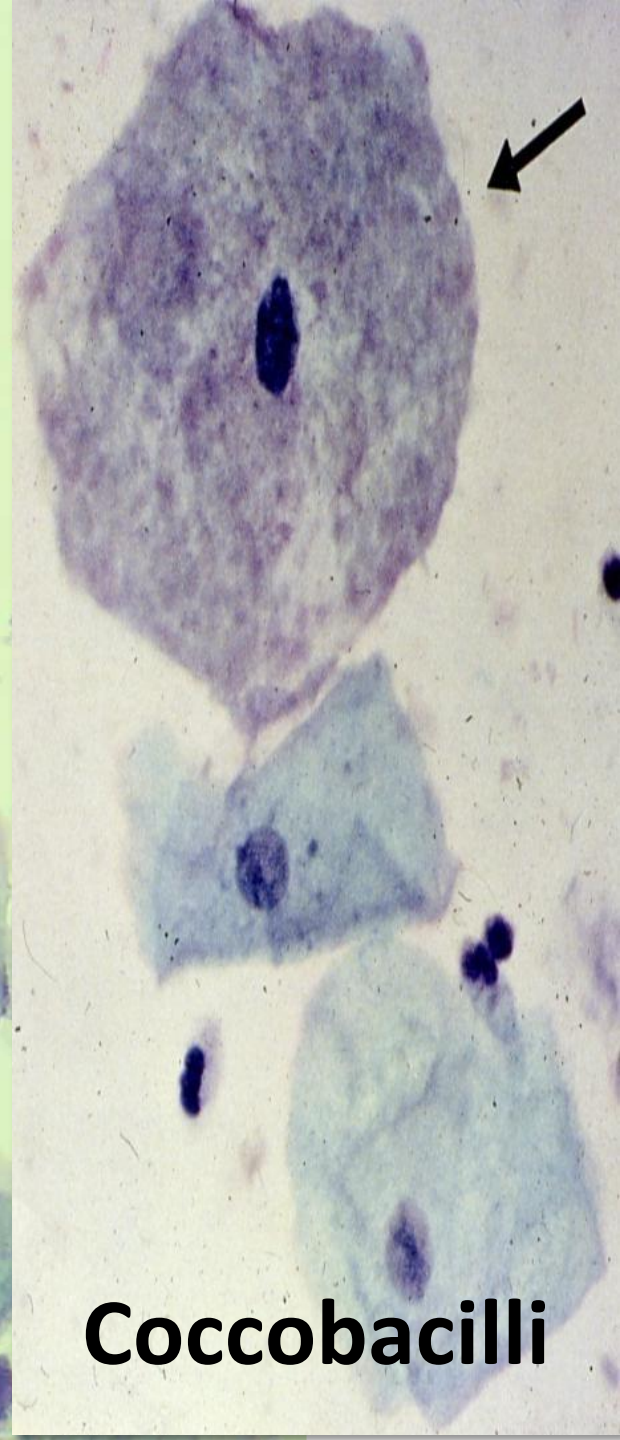
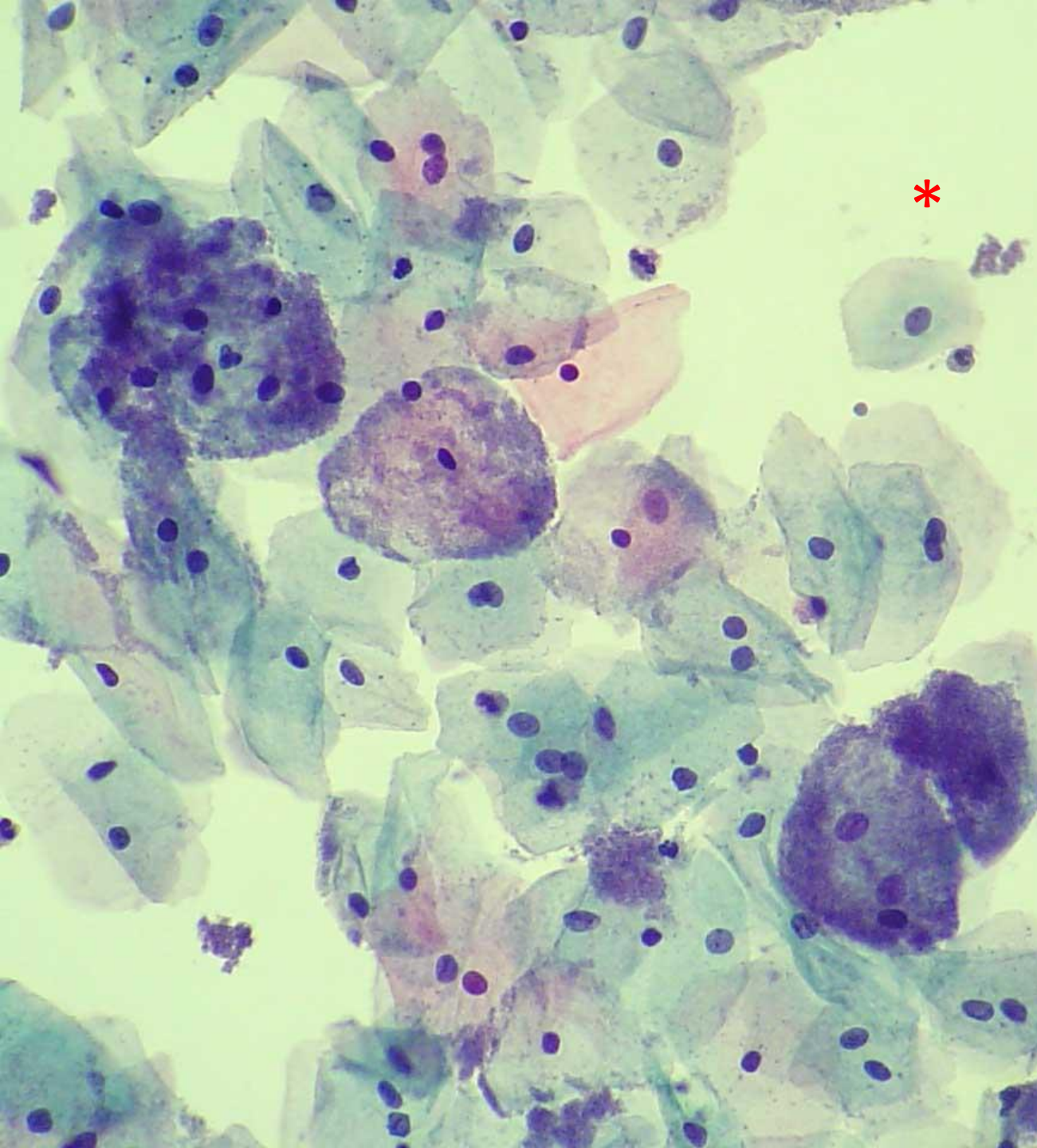


Doderlin bacilli (lactobacilli)

Magnification
High

*2- Gardnerella (Haemophilus) vaginalis (Coco bacilli)

- A common vaginal bacterial infection which is usually accompanied with yeast, trichomonas or urinary tract infection.
- The infection diagnose by the presence of the masses in the background of the smear that covers the surface of large vaginal squamous epithelial cells (**clue cells**).
- Clue cells which form by Coco bacilli.



Coccobacilli

***3- Actinomyces (Actinomycosis)**

- A presence of amorphous cluster or balls of purple stained (dense central core), filament balls.
- Branching of the filaments may occasionally be seen.
- This invasion seems to be related to the prolonged used of INTRA UTERINE DEVICES (IUD).

*

Actinomyces



***4- Leptothrix**

- **Larger and segmented unlike doderlein bacilli which is shorter and narrower.**
- **Usually elongated and very thin hair like structure with rare branching.**
- **Stain poorly and grayish in color.**

*

Leptothrix



Parasitic Infection

Trichomonas vaginalis

- One of the most common parasitic infections of the F.G.T.
- The disorder involves the vagina, urethra and bladder in women.
- The vagina is the most common site of infection in women. In men, it affects mainly the prostate gland and urethra (urine canal).

*Characteristics:

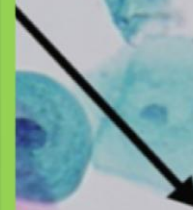
- **Trichomonas vaginalis** is a parasitic protozoan flagellate, and organisms vary in size but are usually around 10 μm in length and 7 μm in width.
- It usually has an oval or pear-like shape, but can assume an amoeboid form when attached to vaginal epithelial cells.
- In fixed and stained slides, the parasites become circular in size, and different in shape. Has characteristic greenish or gray color. Flagella often seen
- Its cytoplasm contains reddish granules and the shadow nucleus is present.

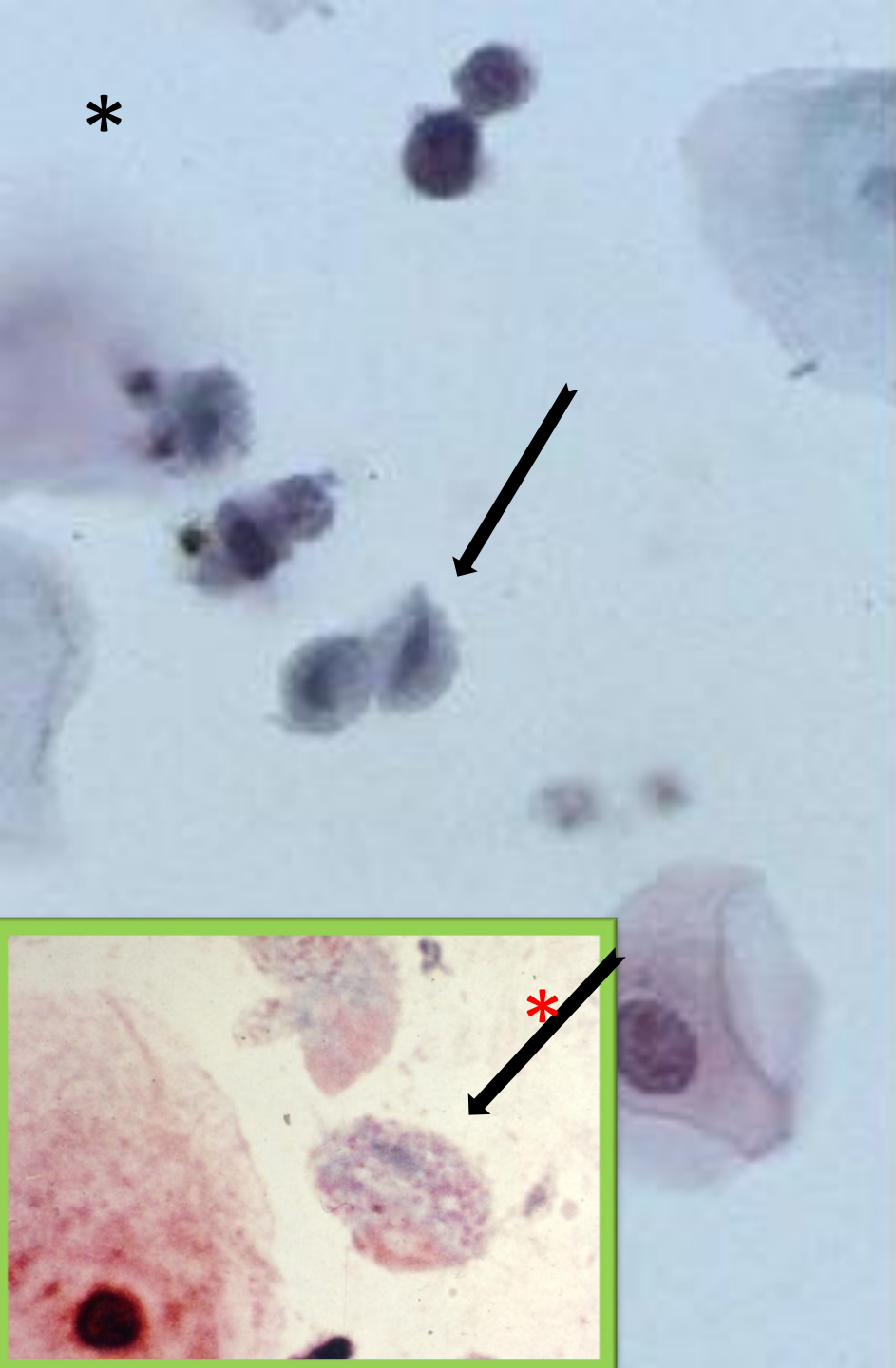
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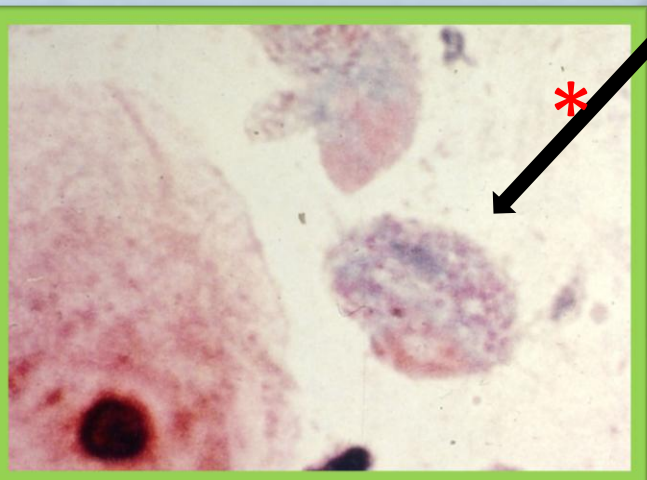
Trichomonas vaginalis

peri nuclear halo /inflammation infection with trichomonas





Trichomonas vaginalis



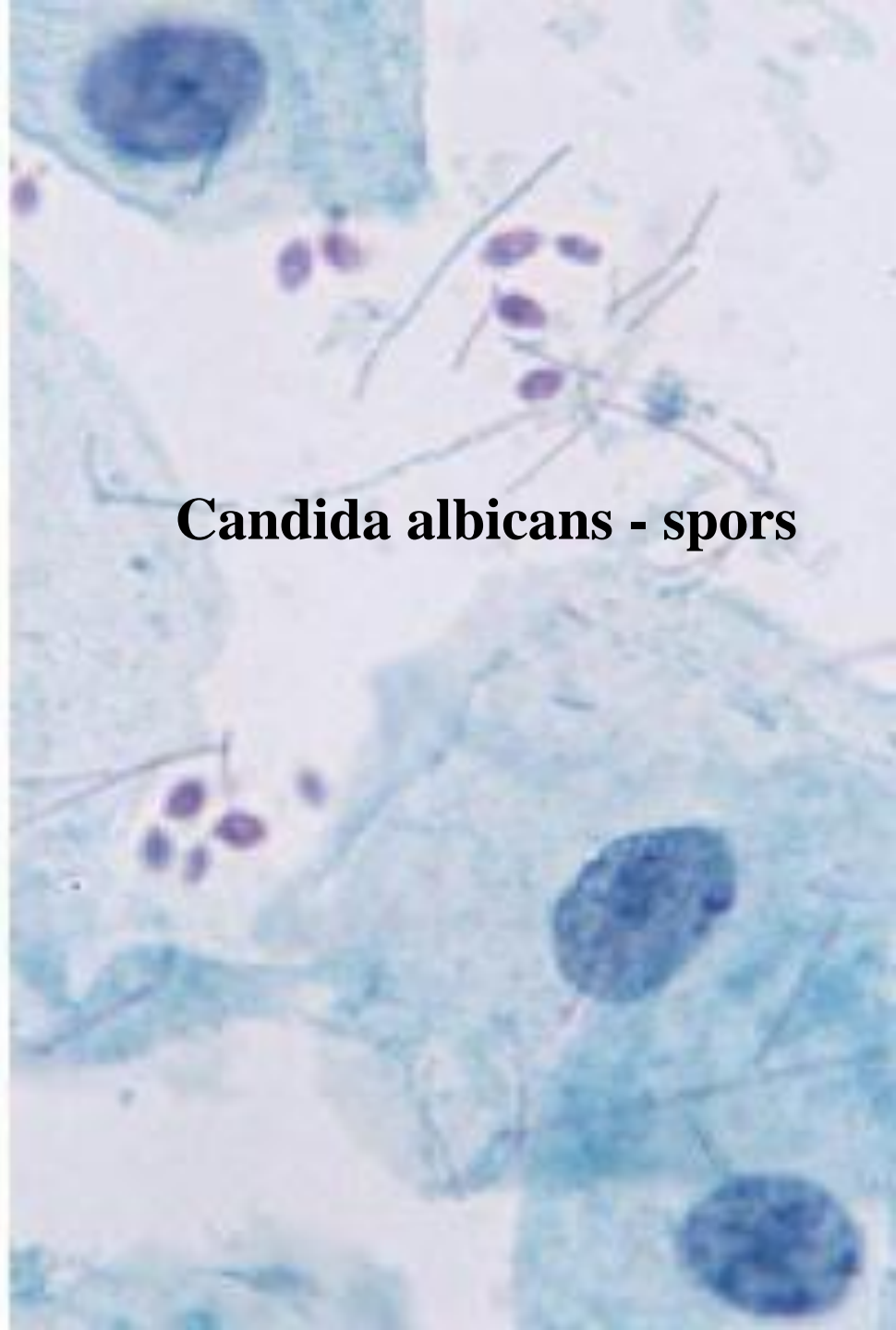
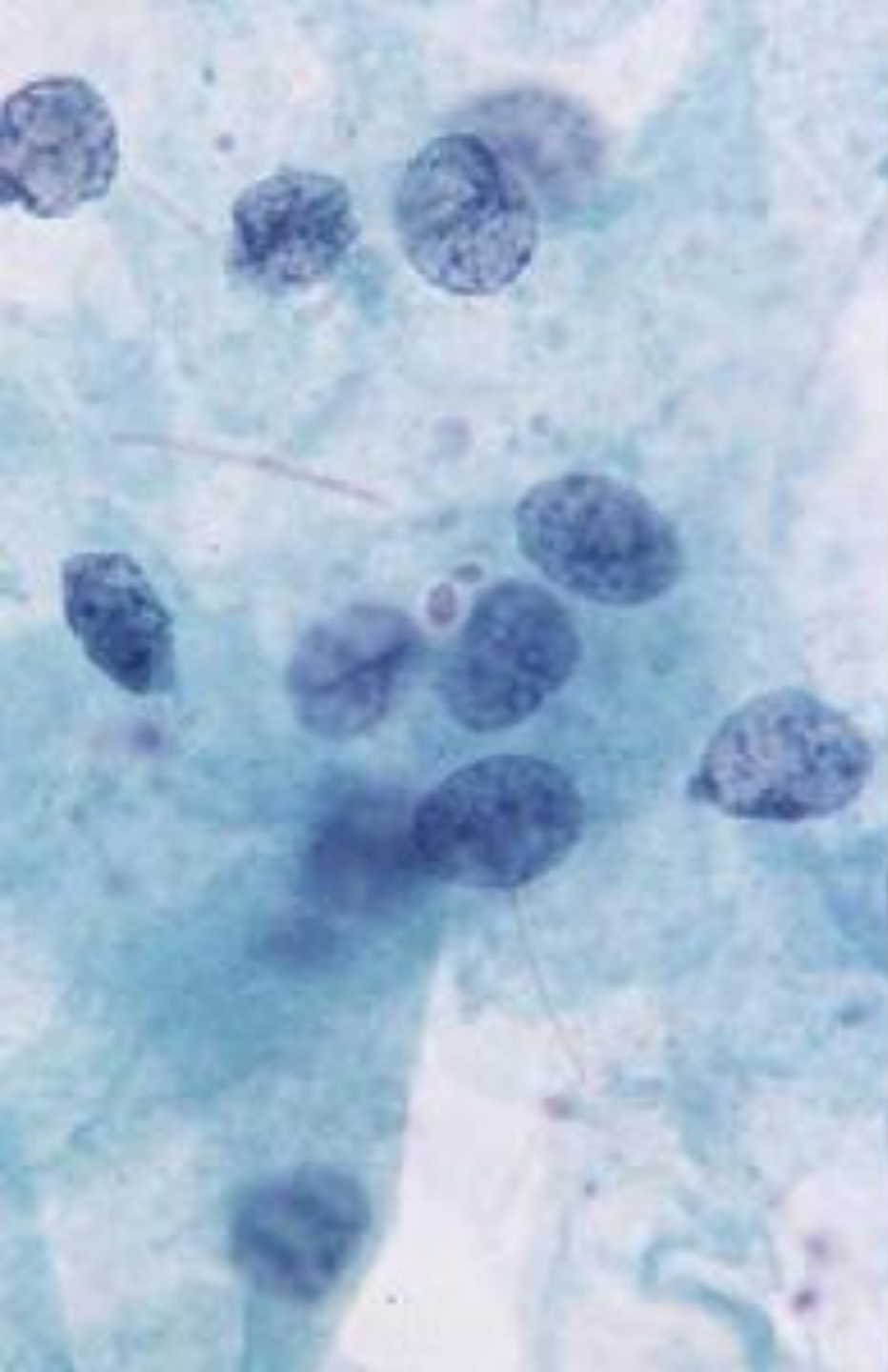
Fungi Infection

*Vaginal Candidiasis

- Is an infection or inflammation of the vagina caused by a yeast-like fungus (usually Candida Albicans = single-celled fungus).
- It is the second most common vaginitis (bacterial vaginitis is the most common). Because candida is part of the body's normal flora.
- Yeast infections are common during pregnancy, due to the alteration in the acidity and the sugar content of vaginal secretions. Oral contraceptives, which have a similar effect in the body, also can lead to the development of yeast infections.
- Intrauterine devices (IUDs) can create a more favorable environment for fungal growth by decreasing normal vaginal secretions.

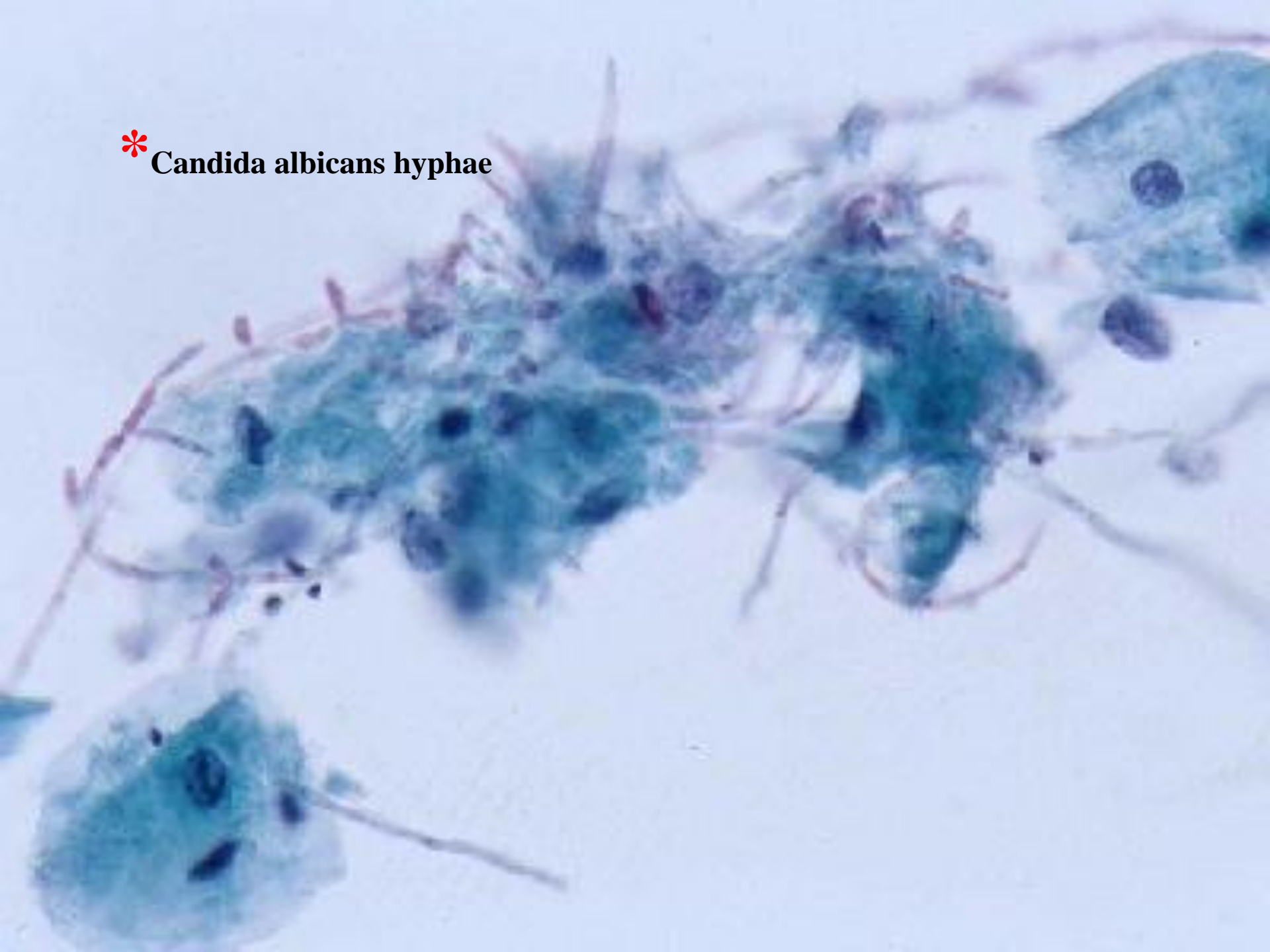
***Characteristics:**

- Easily identified
- Hyphae and budding clearly visible.
- Stained light pink with Pap smears.
- Weaves through the cells
- Associated inflammatory changes still identified
- Shish Kebab appearance



Candida albicans - spors

* **Candida albicans hyphae**



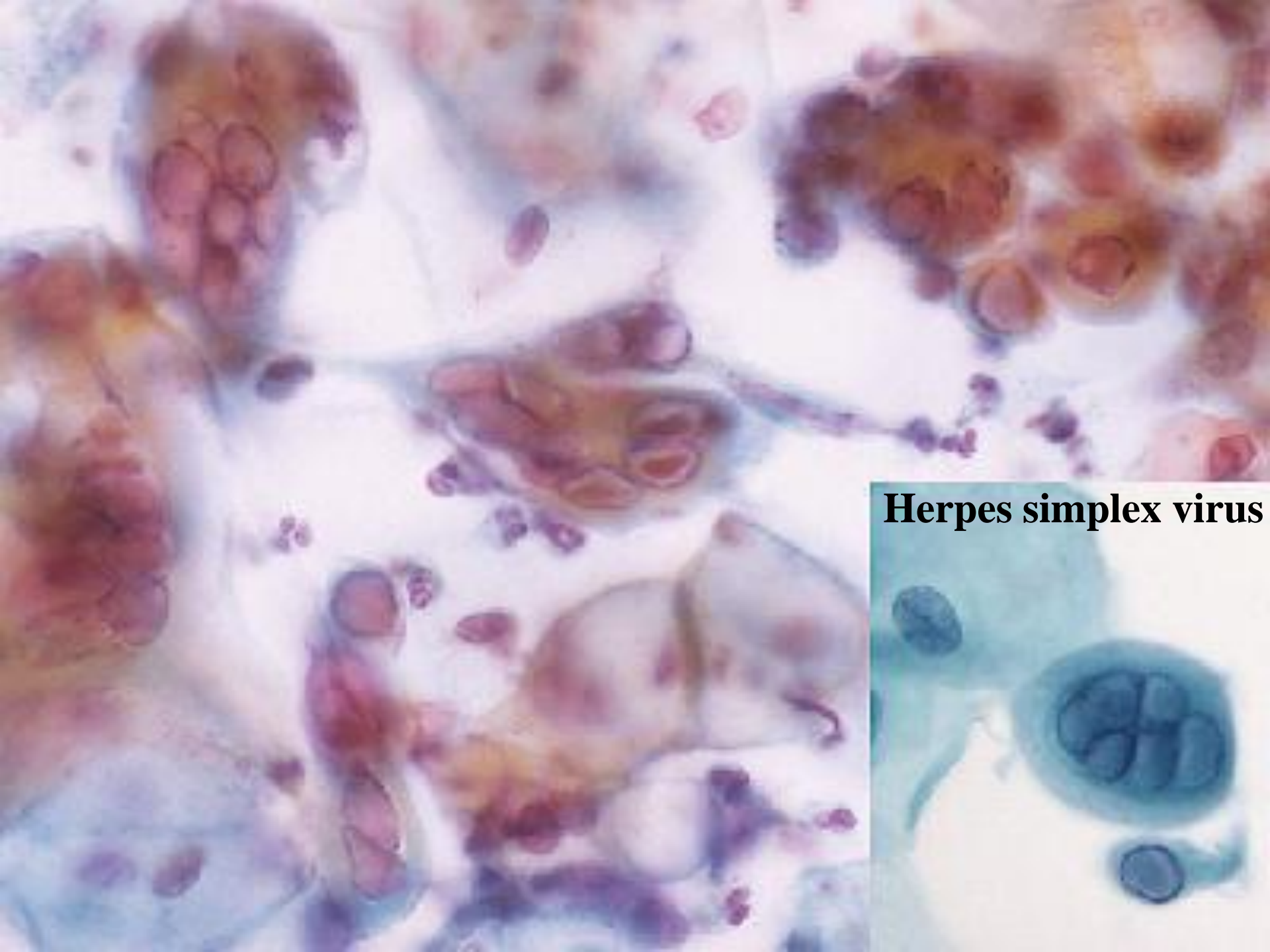
***Viral Infection**

Viral Cytopathic Changes:

- **Late ballooning type of cytoplasmic and nuclear degenerative vacuolization.**
- **Nuclear enlargement followed by distortion and lysis.**
- **Inclusion body, surrounded by more or less prominent halo.**
- **Development of multinucleation.**
- **Disturbance of the texture of cytoplasmic ground substance, hypertrophy of the cytoplasm or the nucleus or both.**

***1- HERPES SIMPLEX VIRUS (HSV):**

- Characteristic cytopathic effect is seen in both squamous and endocervical columnar cells.
- The infected cells maybe mononuclear, but more often contain several nuclei which mold on each another.
- The nucleus has a ground glassy appearance due to the accumulation of intra-nuclear viral particles.
- The chromatin pushed to the periphery, sharply demarcates the nuclear margin.



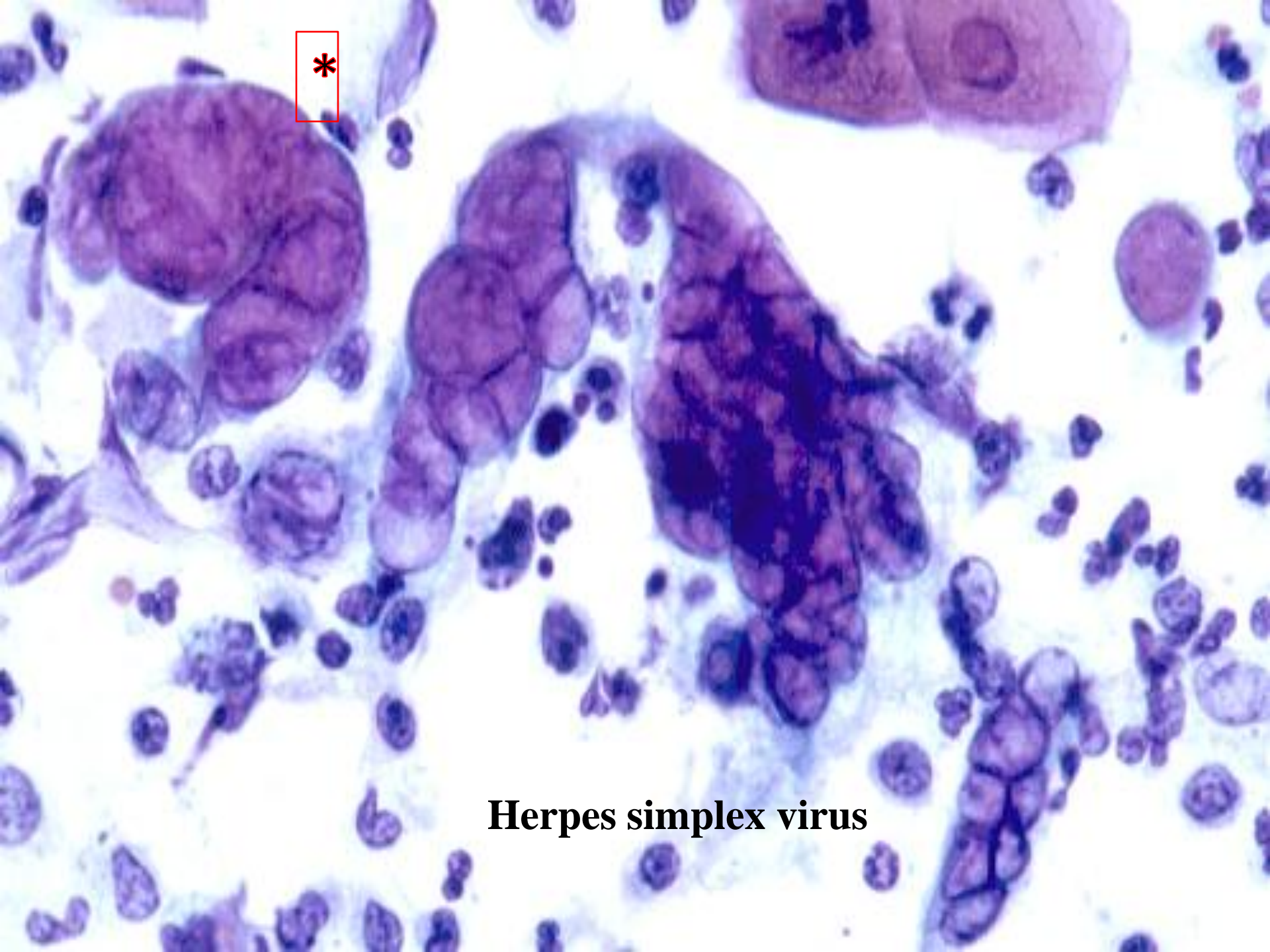
Herpes simplex virus



***One clumps of chromatin may be seen attached to the inner surface of the nuclear membrane.**

- **Multinucleated giant cell**
- **Prominent molding of the nuclei**
- **Associated inflammatory appearance**
- **Often intermingled with endocervical and metaplastic cells**



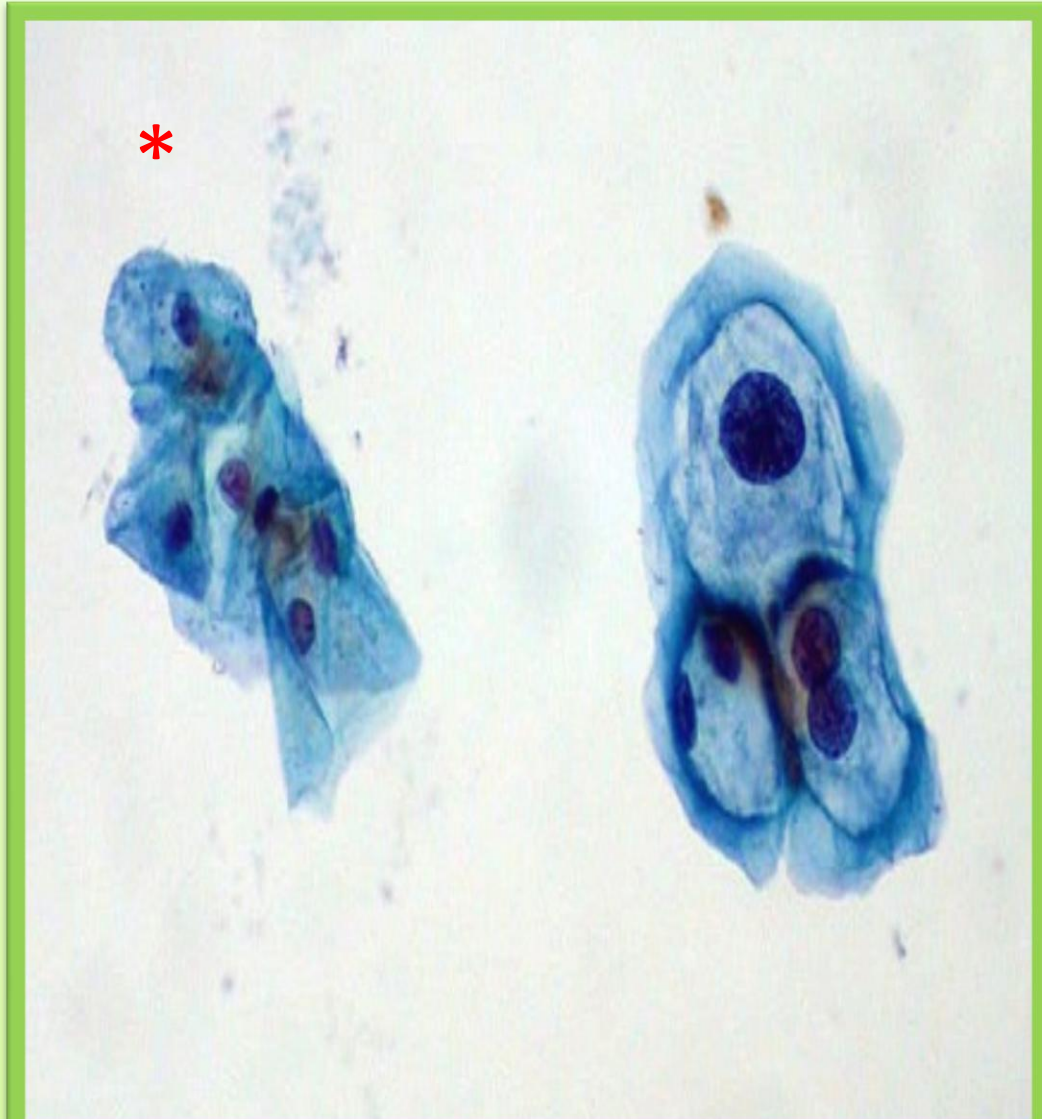


Herpes simplex virus

***2-HUMAN PAPILLOMA VIRUS (HPV)**

- Sexually transmitted viruses, known to cause **Papillomas & warts.**
- The change is seen in intermediate squamous cells and consists of a **large peri nuclear vacuole.**
- Surrounded by **thick, deeply stained cytoplasmic rim,** affected cells is referred as Koilocyte.

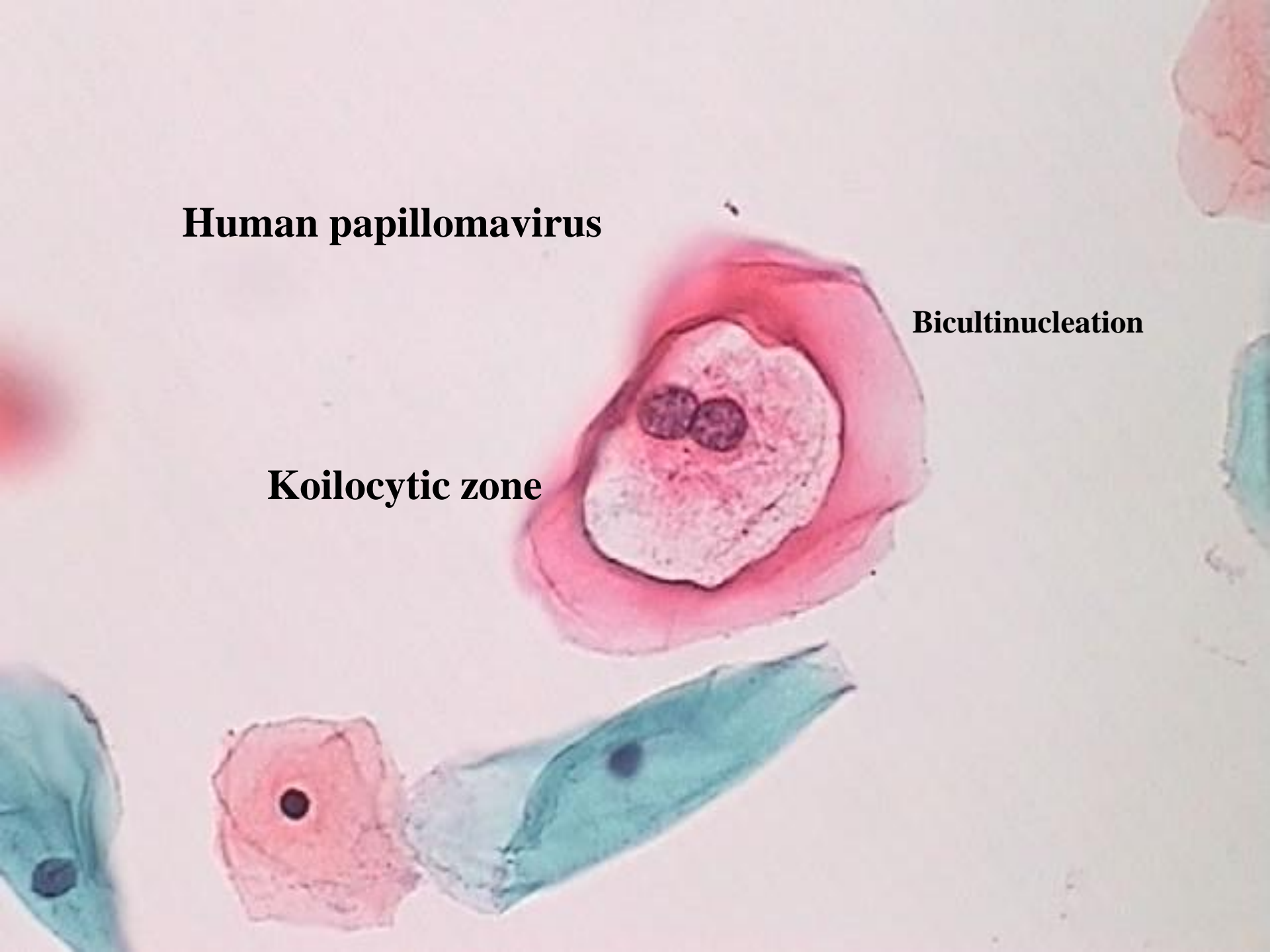
- Vacuole is large and the nucleus may be enlarged, irregular, hyperchromatic, binucleation or multinucleation is common feature.
- Increase N/C ratio
- Dyskeratosis



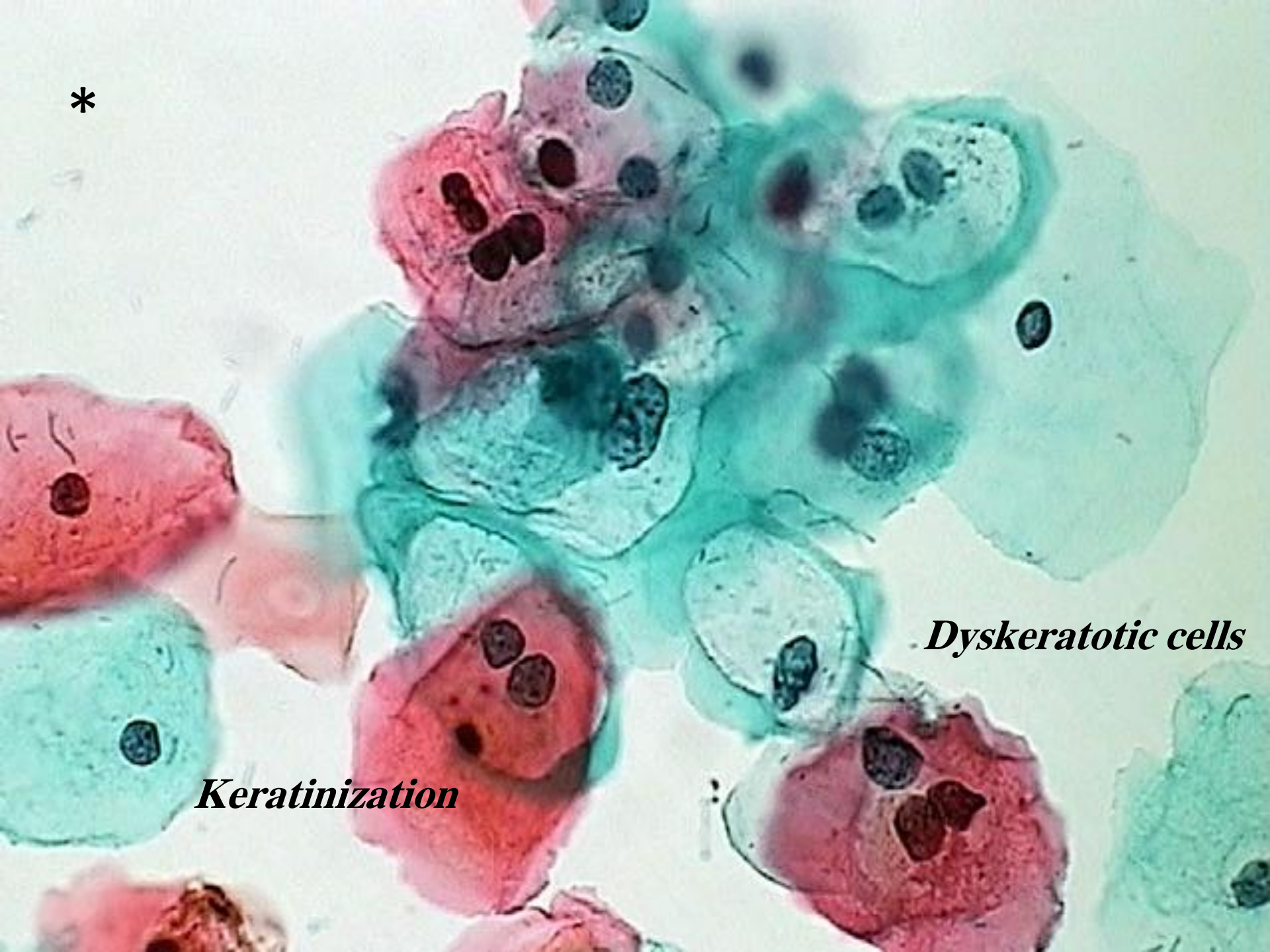
Human papillomavirus

Bicultinucleation

Koilocytic zone



*

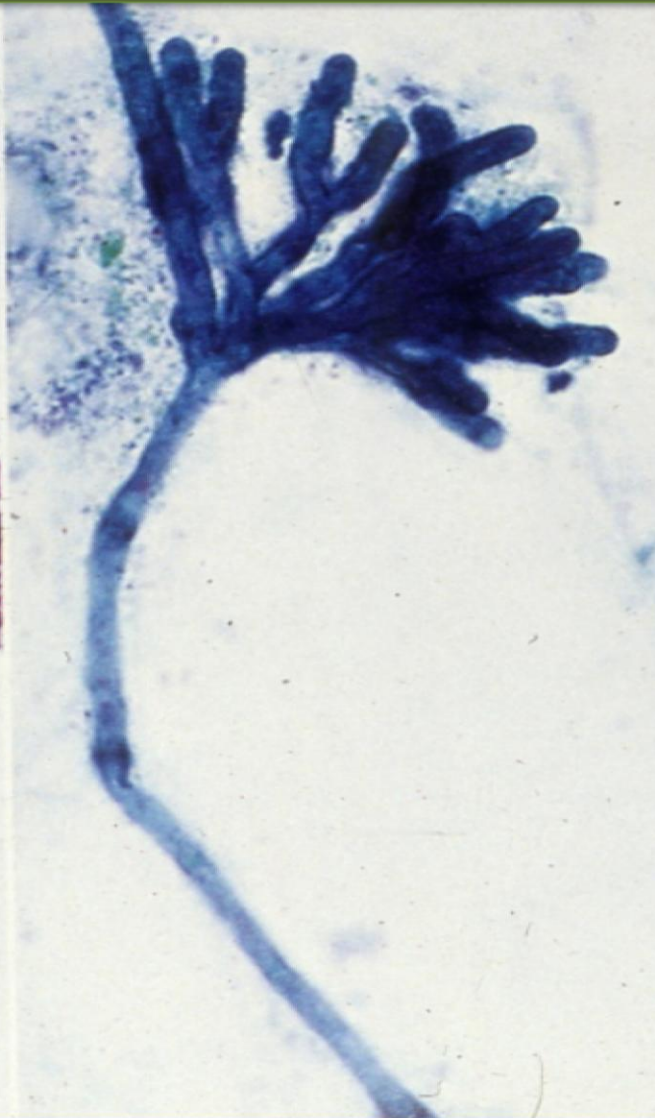
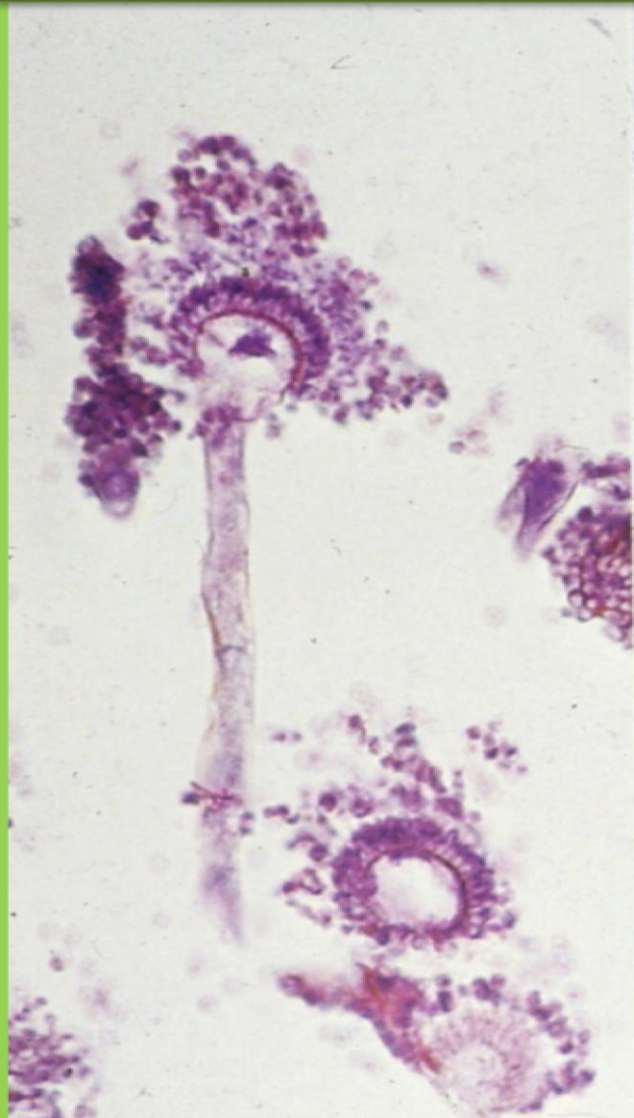


Dyskeratotic cells

Keratinization

Other inflammatory Features

ASPERGELOUS



ASBESTOS BOSIES

