

Laboratory Diagnosis of Vaginitis and vaginosis

Dr. Ali Somily

Termonology and Pathogenesis

- **Vulvovaginitis, vulvitis, and vaginitis**
- Are general terms that refer to the inflammation of the vagina and/or vulva
- **Normal flora**
- Lactobacilli
- Changes in the vaginal acidity or disturb the normal bacteria in the vagina may predispose to an infection .

Characteristics of the Vagina and Cervix in Women of Reproductive Age

	Vagina	Cervix
pH	<4.5	7.0
Epithelial cells	Squamous	Columnar
Pathogens/ Syndrome	Bacterial vaginosis Candida species Trichomonas vaginalis	Neisseria gonorrhoeae Chlamydia trachomatis

VAGINOSIS/VAGINITIS

- Most common reason for patient visit to OB/GYN.
- Three primary infections in order of prevalence:
 - Bacterial vaginosis
 - Candidiasis
 - Trichomoniasis

Causes of vulvovaginitis

- **Bacterial** : Bacterial vaginosis (40%)
- **Fungal** : Candida vulvovaginitis (25%)
- **Parasitic** : trichomonal vulvovaginitis (25%)
- **Low estrogen levels** (called "atrophic vaginitis")
- **Allergic or irritation or injury response** from spermicidal products, condoms, soaps, and bubble bath called “contact vulvovaginitis”.

History

- General gynecological history
- Menstrual history
- Pregnancy
- Sexual Hx
- Contraception
- Sexual relationship
- Prior infection
- General medical Hx
 - Allergies
 - DM
 - Malignancies
 - Immunodeficiency
- Medication
 - OCP < steroids, douches
- Symptoms

Bacterial Vaginosis

- Most common of vaginal syndrome
- A change in the balance of normal vaginal bacteria .
- Very high numbers of bacteria such as
- *Gardnerella vaginalis*, *Mycoplasma hominis*, *Bacteroides* species, and *Mobiluncus* species.
- In contrast, *Lactobacillus* bacteria are in very low numbers or completely absent.

Clinical Features

- Itching and burning.
- Fishy-smelling (specially after sexual intercourse and menses)
thin, milky-white or gray vaginal discharge.

Clinical presentation of BV



BV Sequelae

OB complication

- Preterm delivery
- Premature rupture of membranes
- Amniotic fluid infection
- Chorioamnionitis
- Postpartum endometritis
- Premature labor
- Low birth weight

GYN Complication

- Pelvic inflammatory disease (PID)
- Postabortal pelvic inflammatory disease
- Posthysterectomy infections
- Mucopurulent cervicitis
- Endometritis
- Increased risk of HIV/STD

Diagnosis

- Related symptoms and sexual history.
- Examination of introitus may reveal erythema of the vulva and edema of the labia.
- Speculum examination.
- A sample of the vaginal swab.

Office Diagnostics for Vaginitis

- Empiric diagnoses often inaccurate and lead to incorrect treatment and management.
- Need for rapid, accurate and inexpensive diagnostic tests.

OFFICE-BASED TESTS FOR VAGINITIS ARE UNDERUTILIZED

- Simple, inexpensive, office-based tests were underutilized.
 - ❖ Microscopy
 - ❖ PH measurement
 - ❖ Whiff amine test

CLINICAL DIAGNOSIS OF BV

Clinical diagnosis.

❖ 3 out of 4 of these criteria.

1. PH greater than 4.5
2. Positive Whiff test
3. Any clue cells
4. Homogenous discharge.

Clue cell wet mount



Gram Stain Diagnosis

- Predominance of lactobacilli = normal.
- mixed small gram-positive and gram-negative rods \pm curved rods = BV.

Gram Stain Diagnosis (cont.)

Score: 0, no cells present

1+, <1cell/OIF

2+, 1-5 cells/OIF

3+, 5-30 cells/OIF

4+, >30 cells/OIF

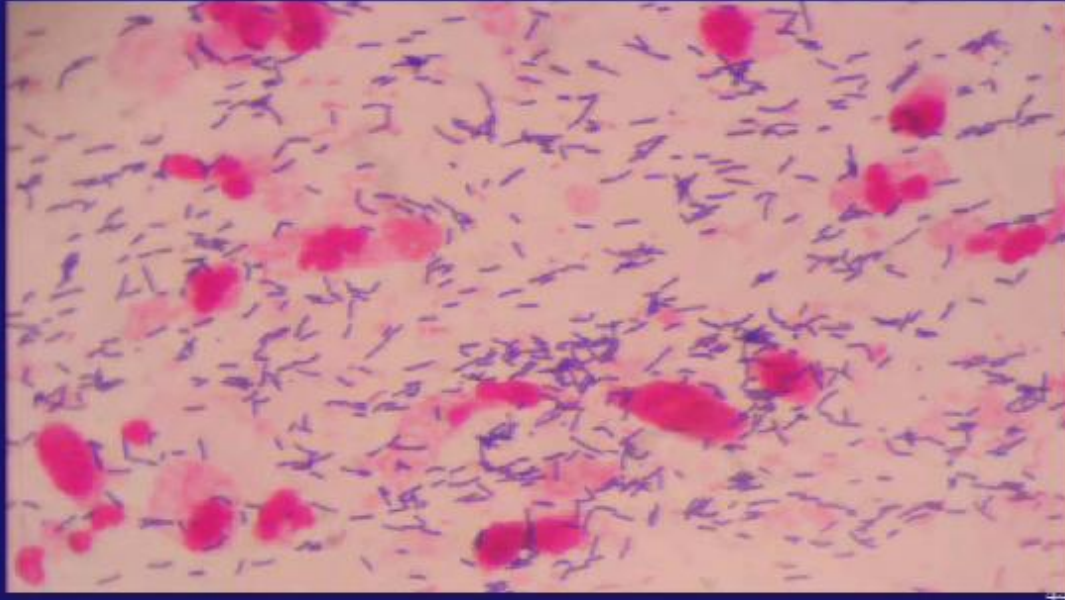
Nugent Scoring System

Score	<i>Lactobacillus</i> morphotype	<i>Gardnerella</i> and <i>Prevotella</i> morphotypes	<i>Mobiluncus</i> morphotype
0	4	0	0
1	3+	1+	1+ or 2+
2	2+	2+	3+ or 4+
3	1+	3+	
4	0	4+	

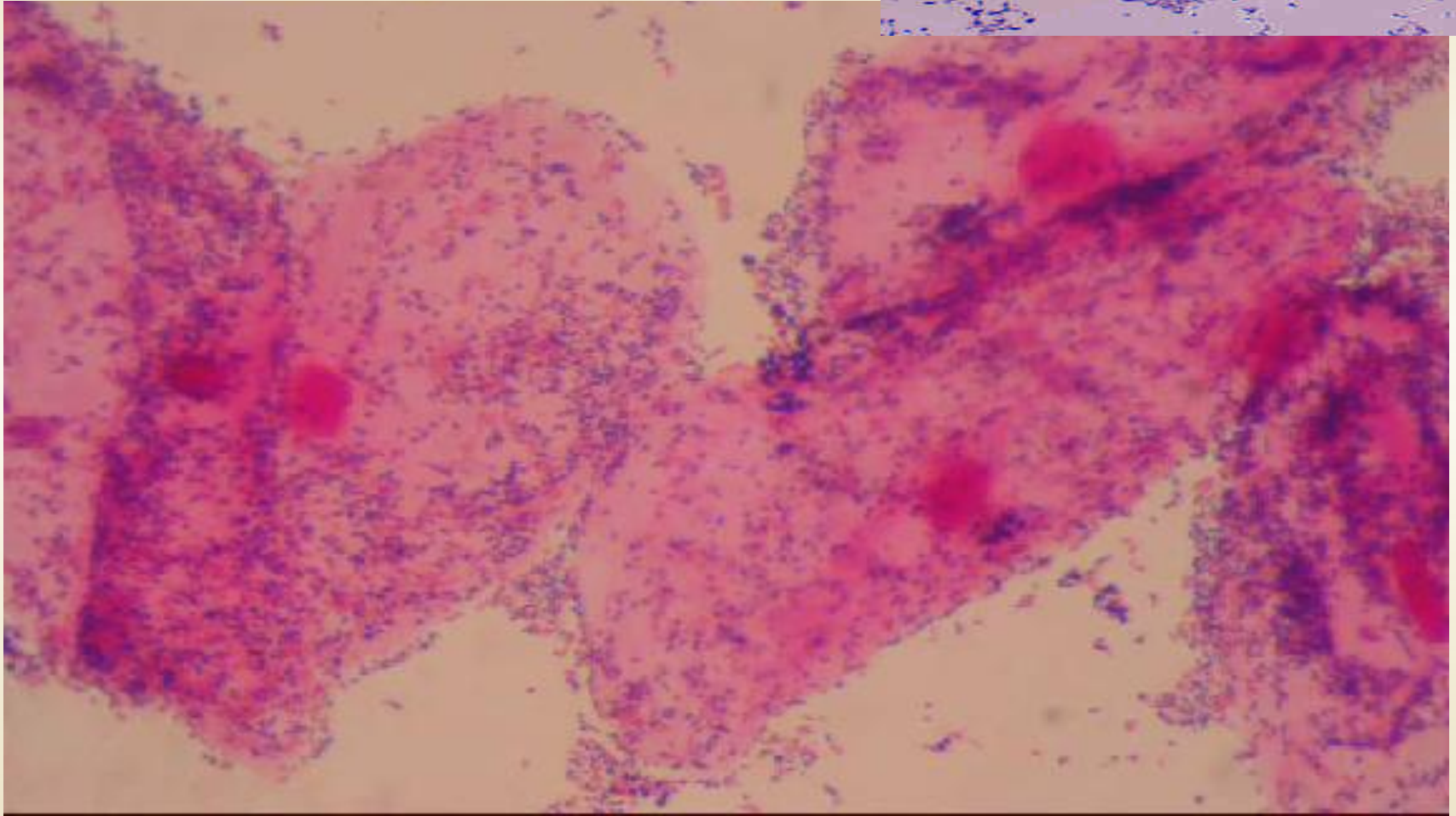
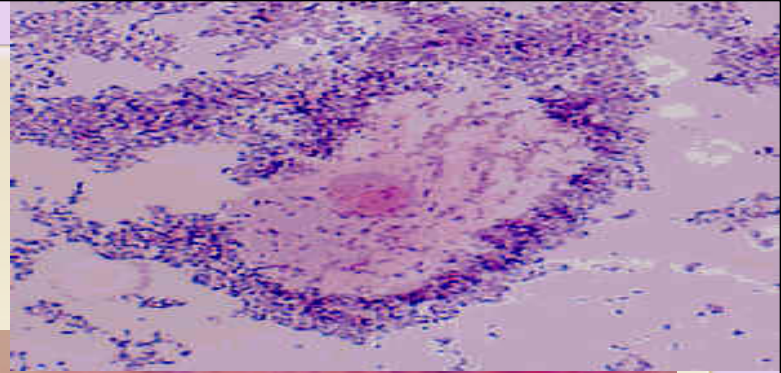
Interpretation: 1-3, normal; 4-6 intermediate (altered vaginal flora); 7-10, BV

Normal vaginal gram stain

Normal Vaginal Gram Stain

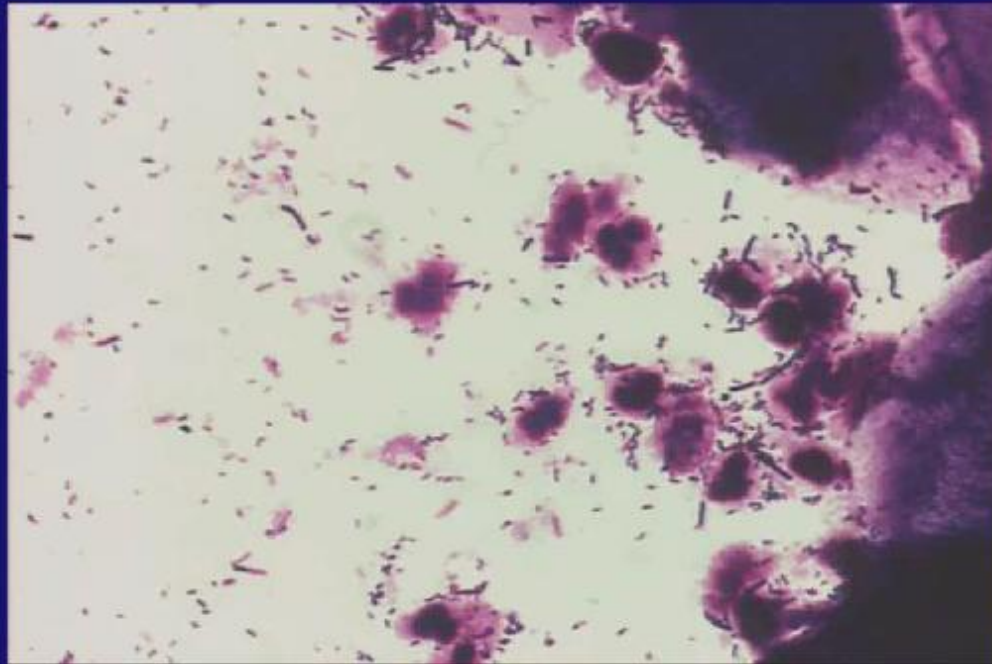


BV



Intermediate gram stain

Intermediate Gram Stain



PH TEST

- PH indicator strips: pH 3.5 ~ 7.0
- Place sample of vaginal secretion on test strip: read while still moist.
- PH > 4.5 indicates abnormality (i.e. *BV*~ *Trichomonas*~ or menstrual blood).
- Be careful not to sample the cervix; cervical secretions and blood have a PH 7.0.



KOH "WHIFF" TEST

- Sample of vaginal secretions are placed in a test tube with 10% KOH.
- KOH alkalizes amines produced by anaerobic bacteria~results in a sharp "fishy odor"

WET MOUNT PREPARATION

- Vaginal secretion sample from the anterior fornix and lateral wall
- Place swab in test tube with small amount of normal saline and place sample on glass slide with cover slip
- Visualize at both low and high power
- Clue cells, yeast, trichomonas, WBC, bacteria.

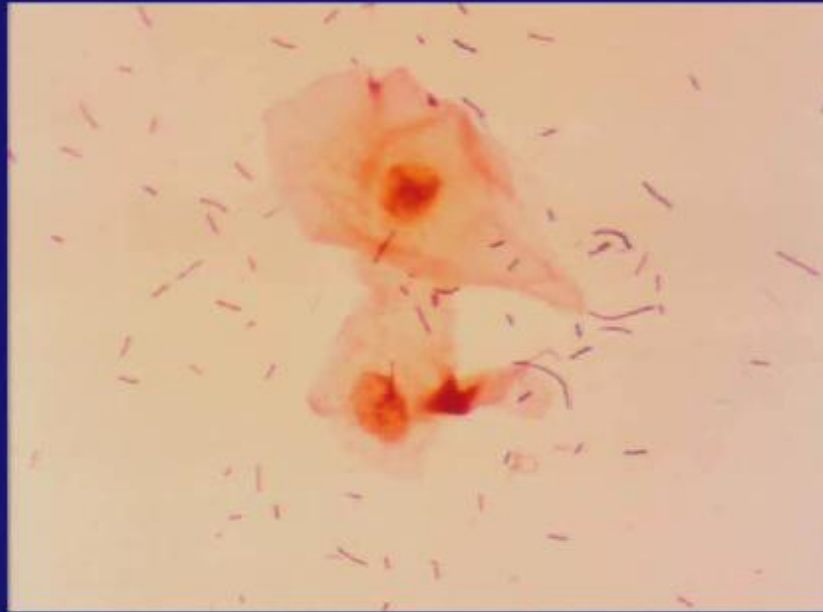


NORMAL-WET MOUNT



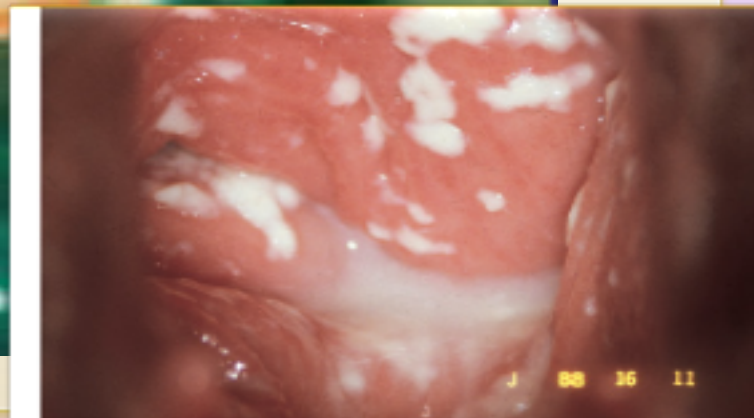
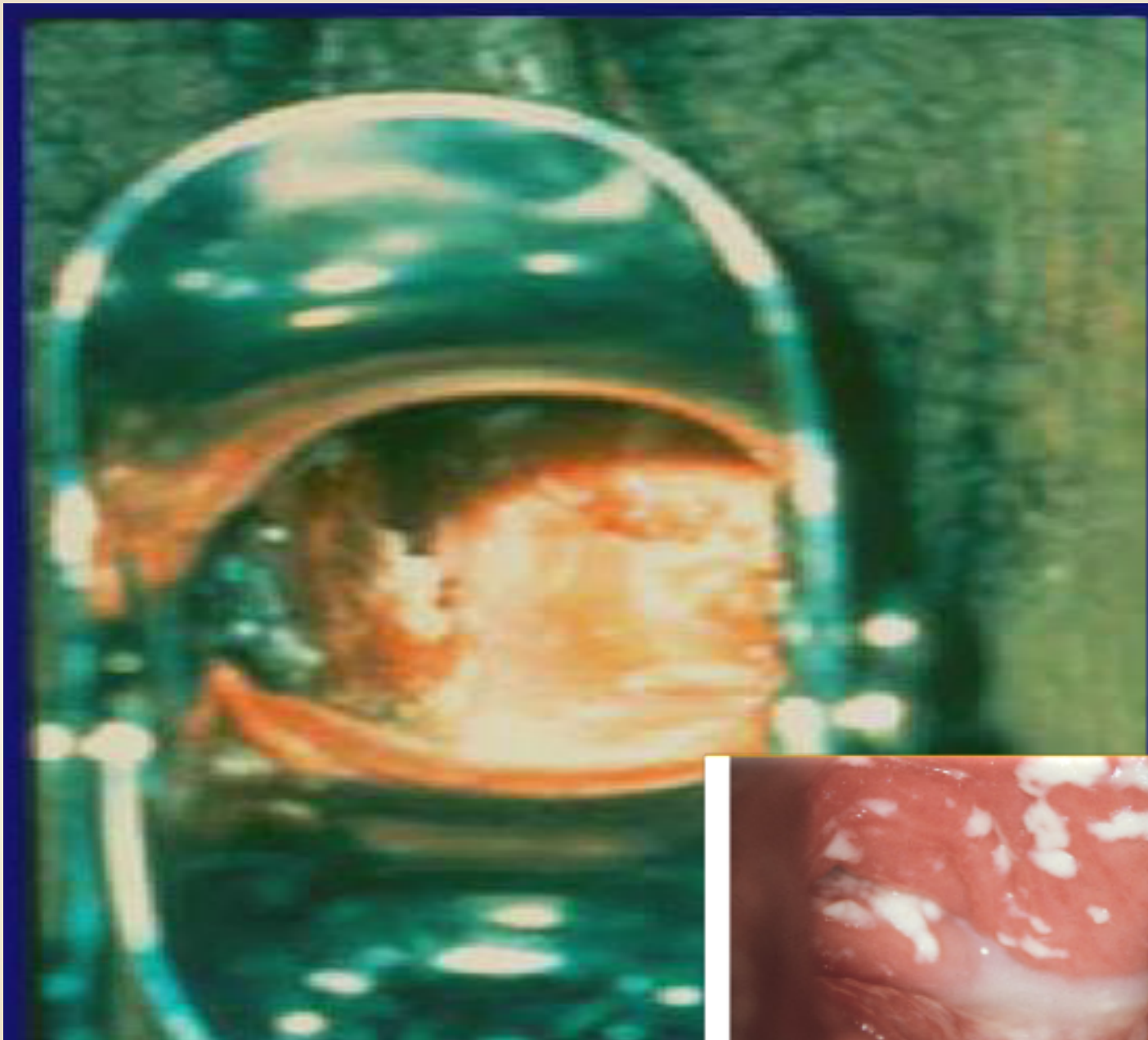
Normal vaginal Gram Stain

**NORMAL VAGINAL
GRAM STAIN**



CANDIDIASIS

- Overgrowth of a normal inhabitant of the vagina.
- Predisposing factors: Pregnancy , DM, Immunocompromised conditions, antibacterial treatment .
- Clinical Presentation : Irritation, pruritis, soreness, painful sexual intercourse burring on passing urine , and a thick, curdy, white (like cottage cheese) vaginal discharge.



Diagnosis of VVC

- Wet prep to see clumps of pseudohyphae.
- Budding yeast and no pseudohyphae in patients with *C glabrata*.
- KOH prep helpful but not always necessary.

Yeast-Wet Prep

YEAST-WET PREP



Candidiasis



Vaginal Yeast Cultures

- Probably not routinely indicated ~ many women are colonized with Candida
- If obtained must correlate with patient signs and symptoms
- For recurrent infections culture and susceptibility testing may be helpful

TRICHOMONIASIS

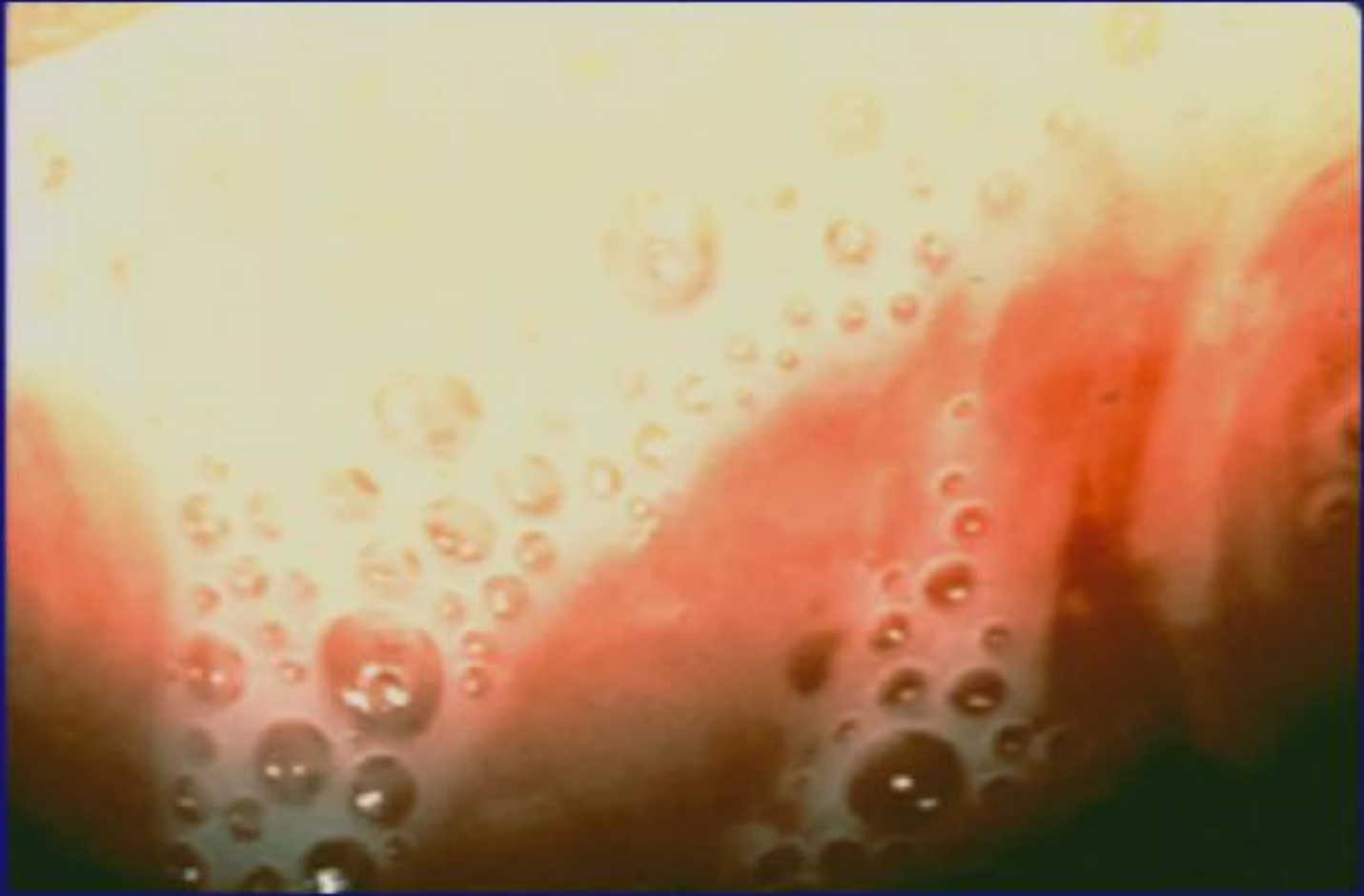
- Sexually transmitted parasite
- Trichomonas is the most prevalent non-viral sexually transmitted disease (STD) agent.

Clinical Features

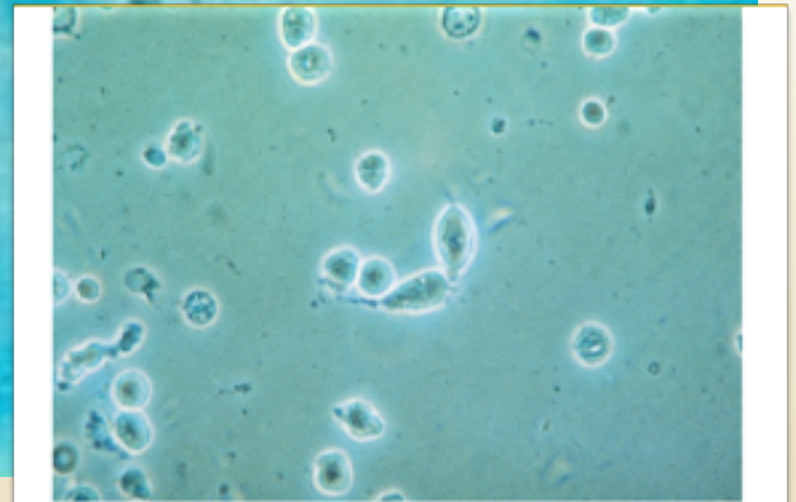
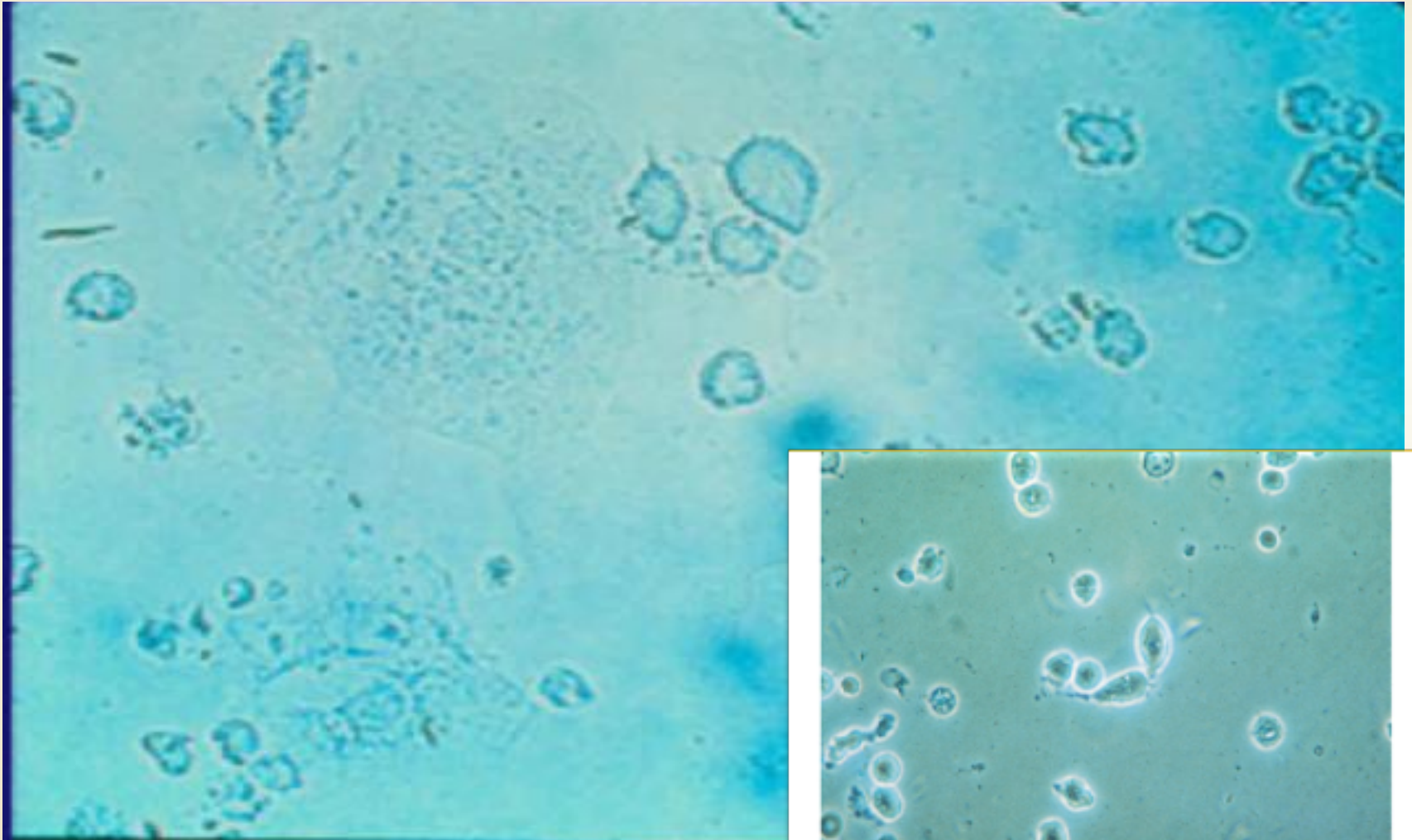
- ❑ Vaginal discharge, pruritis in females, but may be asymptomatic.
- Painful urination, Painful sexual intercourse
- A malodorous smelling yellow-**green** to gray, sometimes **frothy**, vaginal discharge.
- ❑ Males usually asymptomatic, but can cause Non-gonococcal urethritis .

Trichomonas Complications

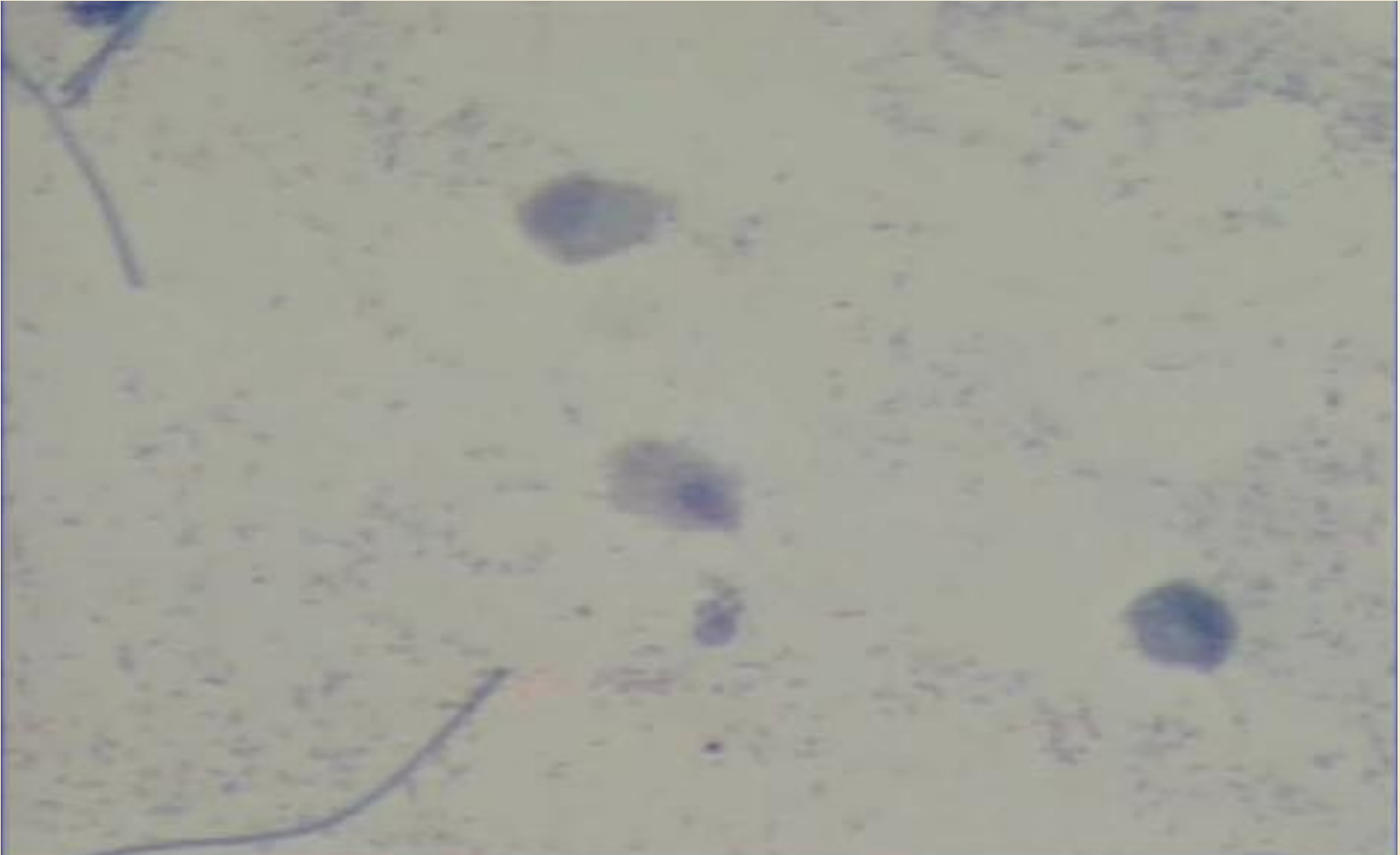
- Trichomonas associated with:
 - Premature rupture of membranes
 - Preterm labor and birth
 - Low birth weight
 - Increased transmission of other STDs including HIV



Trichomonas Wet Prep



Trichomonas-Pap Smear

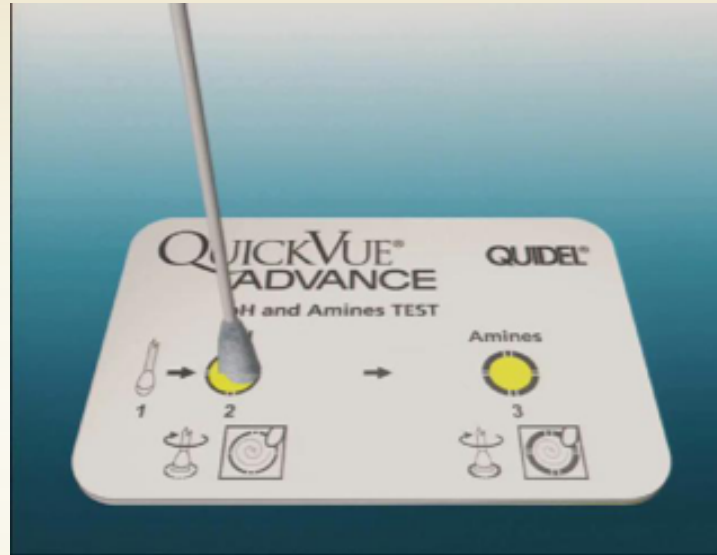




Culture is considered the gold standard for the diagnosis of trichomoniasis. Its disadvantages include cost and prolonged time before diagnosis

Other Methods of Diagnosis

- EIA
- Sensitivity 91.6%
- Specificity 97.7%



- DNA Probe

Clinical syndrome	Etiology	Treatment
<p>Bacterial vaginosis Malodorous vaginal discharge, pH >4.5</p>	<p>Etiology unclear: associated with <i>Gardenella vaginalis</i> <i>mobiluncus</i>, <i>Prevotella sp.</i>,</p>	<p>Metronidazole Tinidazole</p>
<p>Trichomoniasis Copious foamy discharge, pH >4.5 Treat sexual partners</p>	<p><i>Trichomonas vaginalis</i></p>	<p>Metronidazole Tinidazole</p>
<p>Candidiasis Pruritus, thick cheesy discharge, pH <4.5</p>	<p><i>Candida albicans</i> 80-90%. <i>C. Glabrata</i>, <i>C. tropicalis</i></p>	<p>Oral azole: Fluconazole Itraconazole</p>