

Vaginitis: Diagnosis and Management

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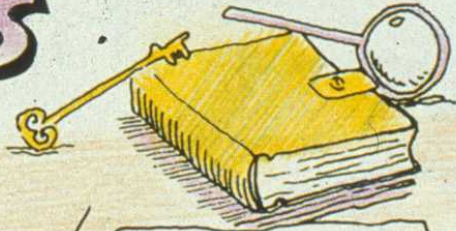
Learning Objectives

- **Describe a differential diagnosis of the patient presenting with a vaginal discharge.**
- **Analyze the role of the office laboratory in diagnosing vaginitis.**
- **Identify the three most common causes of vaginitis and discuss the effective management of each.**

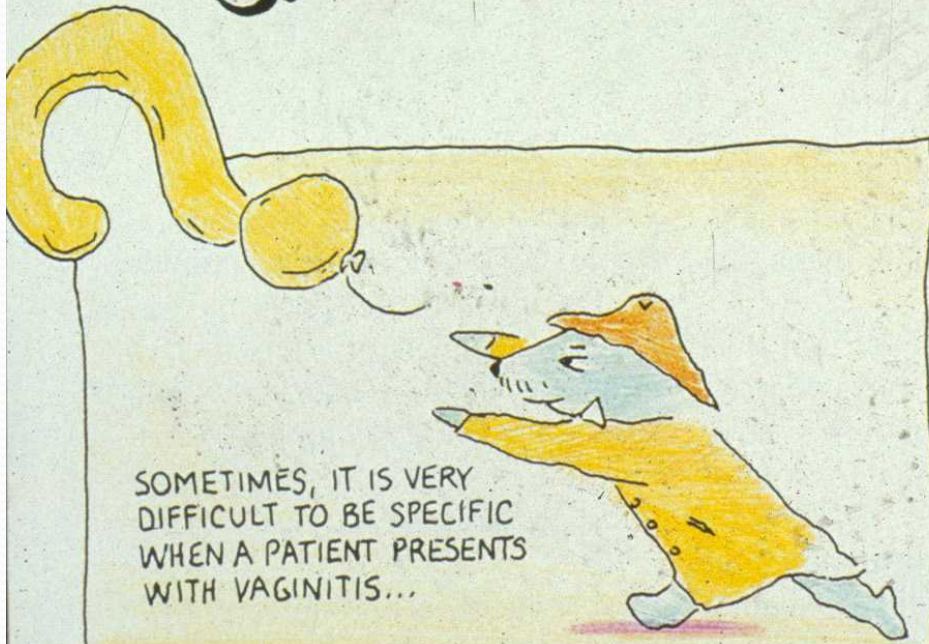
Vaginitis

- **one of the most common gynecologic disorders**
- **10 million office visits/ year and 7 % visits to gynecologists**
- **1 % antibiotics prescribed in ambulatory setting**

A VEXING CASE OF VAGINITIS

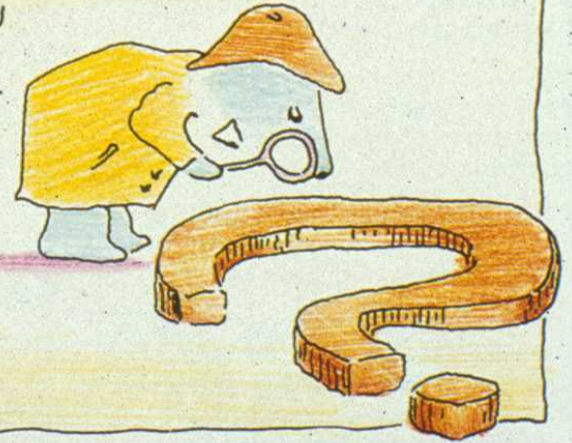


by
INSPECTOR
CLUECELL



SOMETIMES, IT IS VERY
DIFFICULT TO BE SPECIFIC
WHEN A PATIENT PRESENTS
WITH VAGINITIS...

THEREFORE, YOU
AND I MUST ACT
AS DETECTIVES--
DETERMINING
SUSPECTS,
LOOKING FOR
CLUES, MAKING
DECISIONS
BASED UPON
DEDUCTION...



Vaginitis: Differential Diagnosis

- **Infectious vaginitis- 60 %**
 - Bacterial vaginosis**
 - Candida vaginitis**
 - Trichomonas vaginitis**
- **Cervicitis- 20%**
- **Normal discharge- 10%**
- **Atrophic vaginitis**

Differential Diagnosis (con't)

- **Psychosomatic vaginitis**
- **Iatrogenic vaginitis**
 - Foreign body vaginitis**
 - Allergic / irritant vaginitis**
- **Miscellaneous**
 - Cervical polyps/ neoplasms**
 - Vulvar and vaginal neoplasms**
 - Macerated condylomata**



*"Finding the cause of back pain is often difficult,
but let's give it a stab."*

Useful historical items

- **age**
- **menstrual status**
- **characteristics:**
 - **onset**
 - **color**
 - **consistency**
 - **viscosity**

Associated symptoms

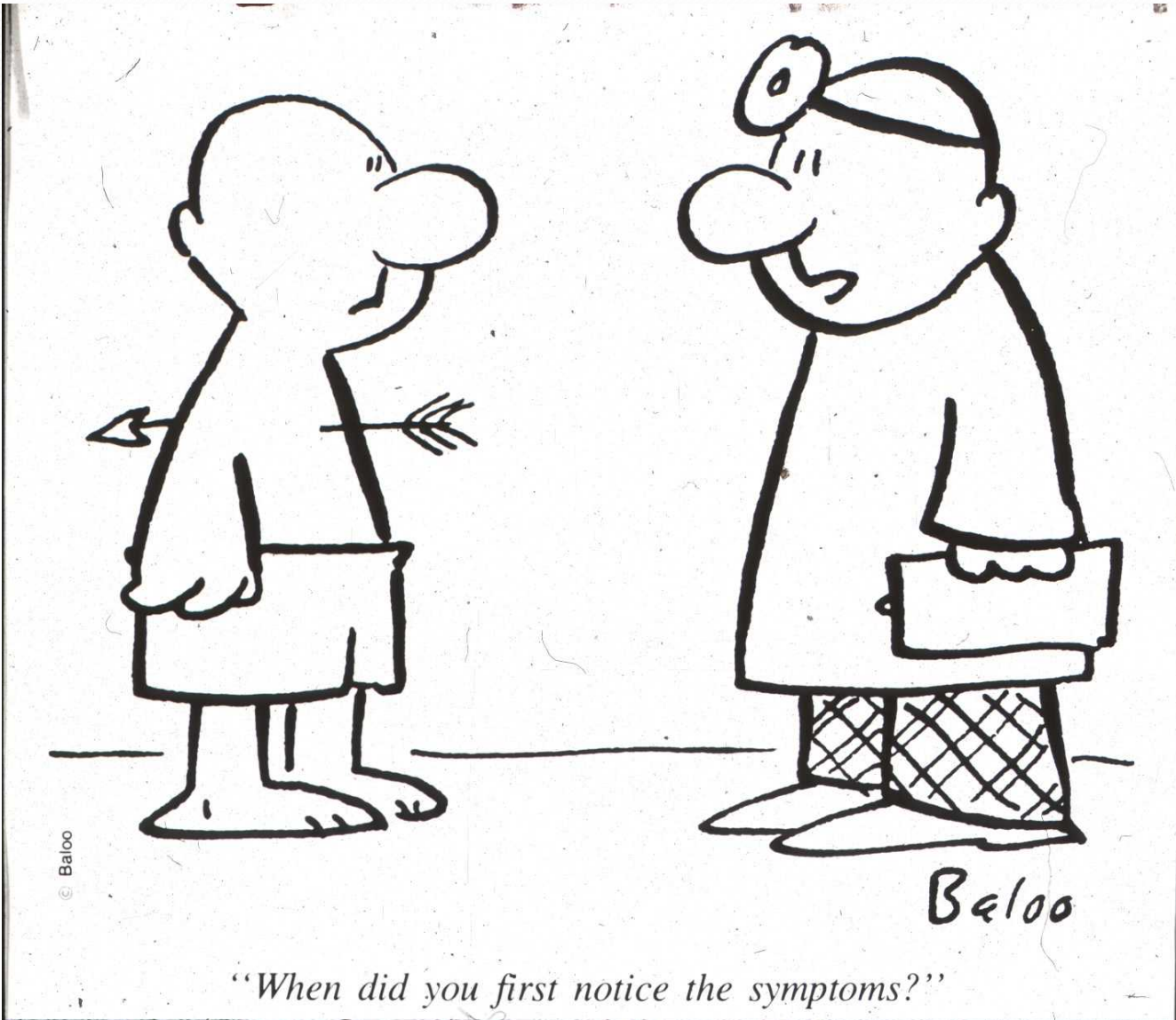
- **pruritis**
- **burning**
- **malodor**
- **dysuria**
- **dyspareunia**

Historical items

- **Past medical history**
 - **diabetes**
 - **recent infection**
 - **medications**
 - **method of contraception**
- **Sexual history**
- **Hygienic practices**

Physical examination

- **careful gynecologic exam**
- **inspection of discharge**
- **close examination of vulvovaginal area**
- **careful inspection of cervix**



“When did you first notice the symptoms?”



Office Laboratory Methods

- **vaginal pool wet mount**
 - **saline prep (0.9 % saline)**
 - **KOH prep (10%)**
- **“whiff” test: (+) in BV**
- **vaginal pH: normal 3.5 to 4.5**
- **“Q-tip” test: (+) in cervicitis**

“Q-tip” test:

Mucopurulent cervicitis



Office Laboratory (con't)

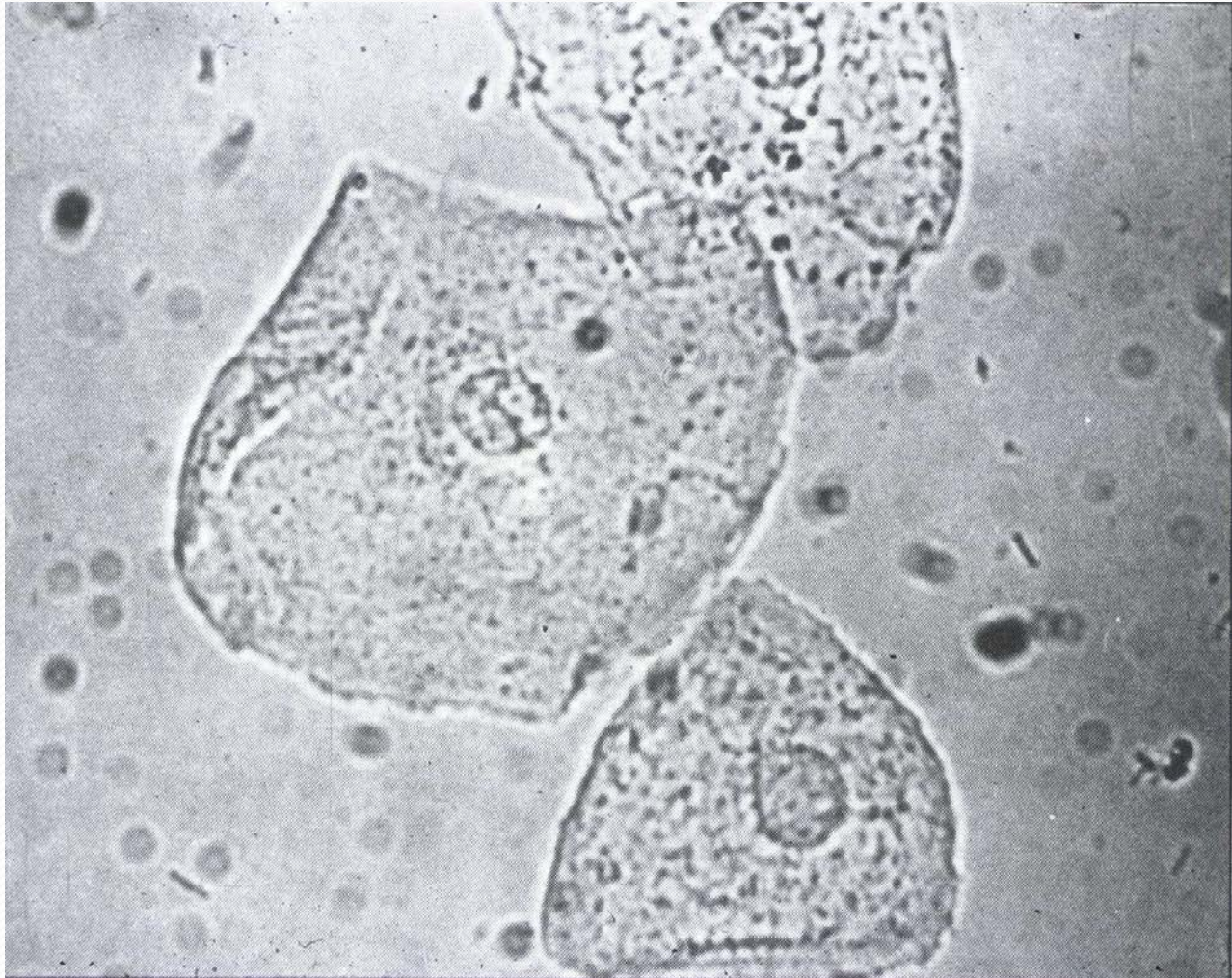
- **vaginal cultures- used on selective basis**
 - **Trichomonas:**
 - **modified Diamond's, Trichosel, InPouchTV**
 - **Candida:**
 - **Sabouraud's, Nickerson's media**

Case # 1:

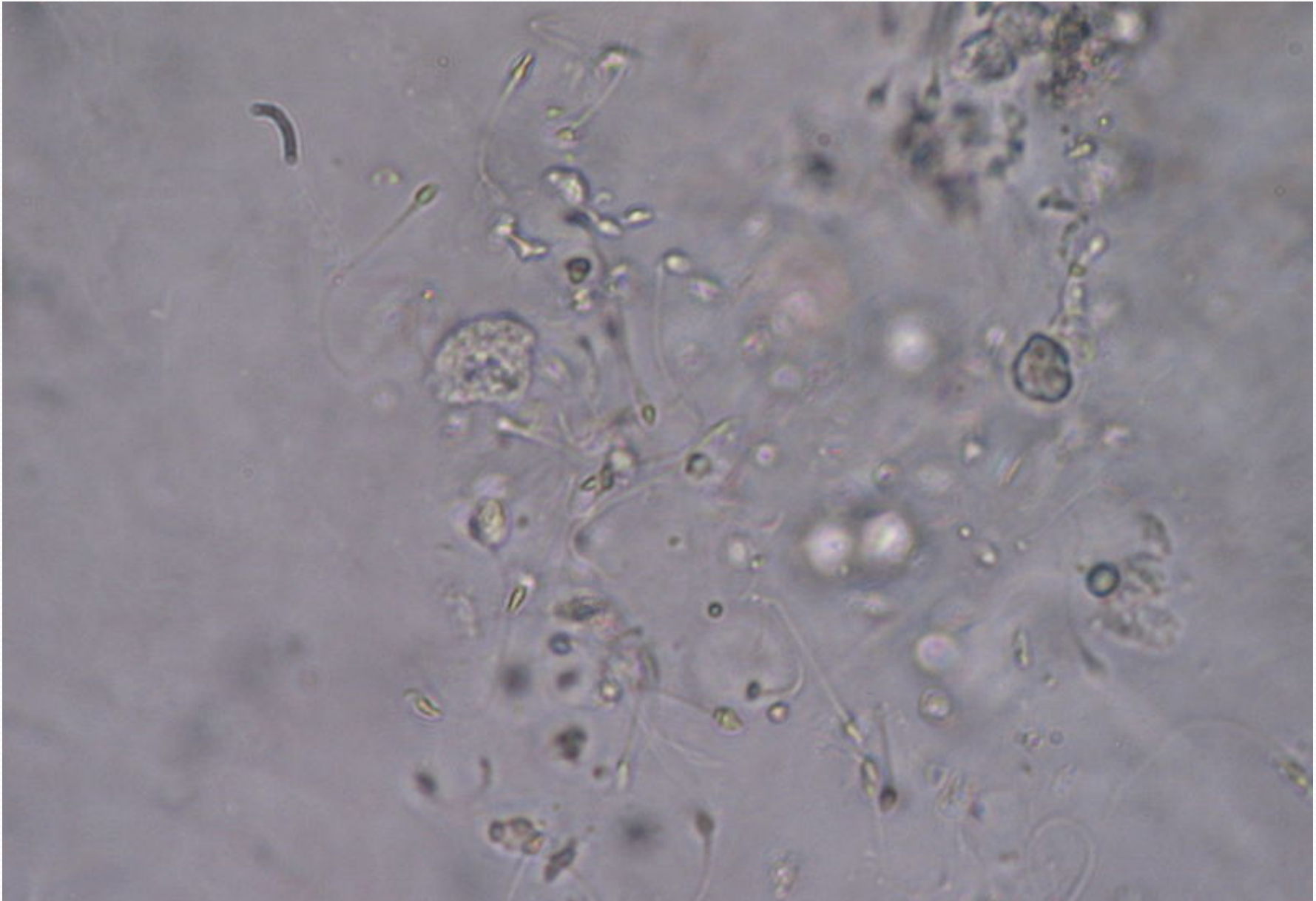
A 17 y/o female HS student presents with a one day history of an increase in vaginal discharge-- slightly sticky & cloudy-- associated with mild soreness. Denies itching, burning, or malodor. Microscopic examination of the saline slide prep shows:

Wet mount:

Vaginal epithelial cells



Vaginal pool wet mount



Case # 1

A 17 y/o female HS student presents with a 1 day history of a vaginal discharge-- slightly sticky & cloudy-- associated with mild soreness.

Denies itching, burning, or malodor.

Microscopic exam

“Whiff test”- neg. Vaginal pH- 6.0

Question # 1:

What is your diagnosis?

- a. Bacterial vaginosis**
- b. Candida vaginitis**
- c. Trichomonas vaginitis**
- d. Abnormal discharge- other**
- e. Normal discharge**

Physiologic discharge

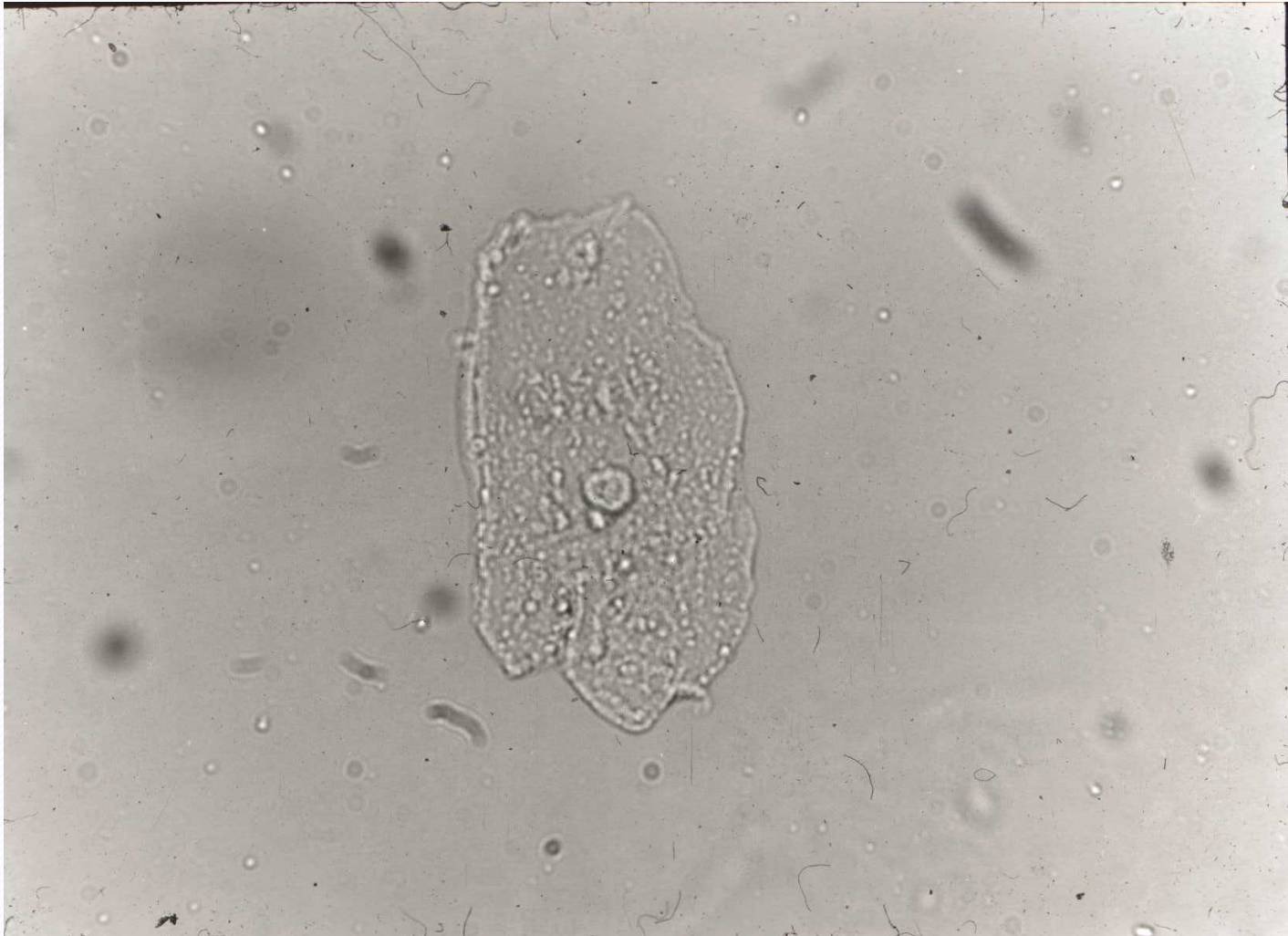
- responsible for 10 percent of cases of vaginal discharge
- composed of vaginal squamous cells suspended in fluid medium
- clinical characteristics:
 - clear to slightly cloudy
 - non-homogeneous
 - highly viscous

Normal vaginal discharge

- **not associated with:**
 - **itching**
 - **burning**
 - **malodor**
- **normal increase in volume**
 - **ovulation**
 - **following coitus**
 - **after menses**
 - **during pregnancy**

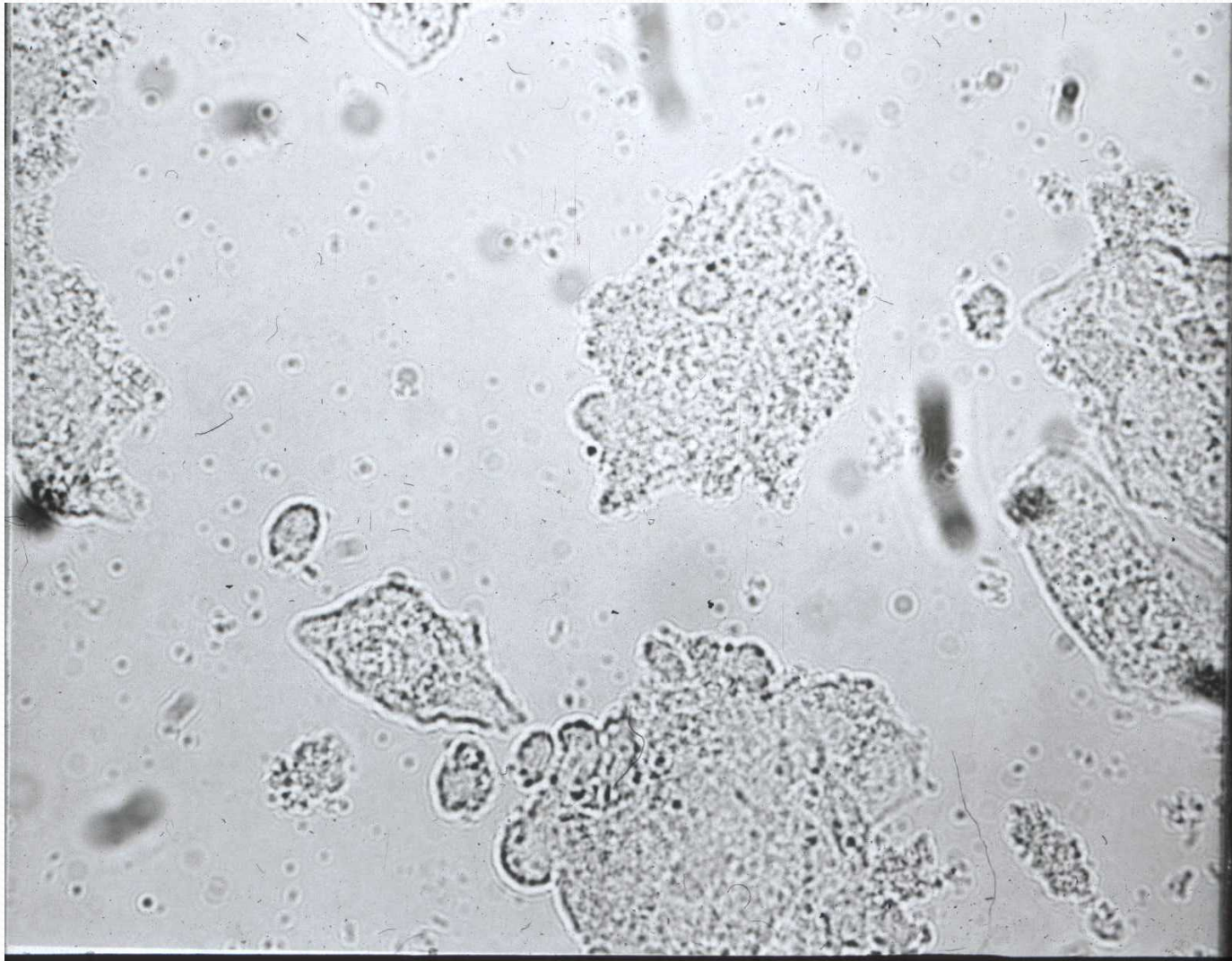
Wet mount:

Normal vaginal epithelial cell



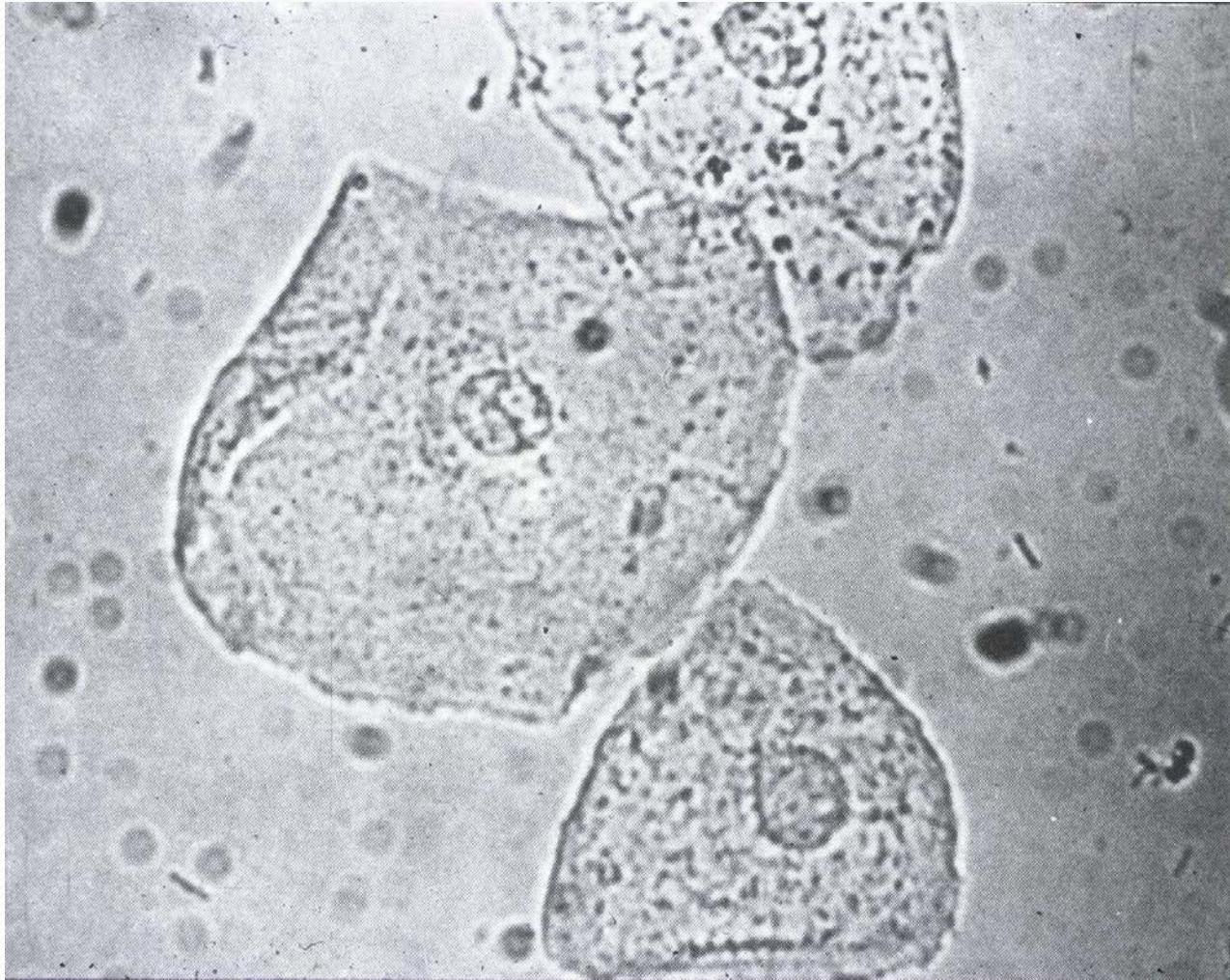
Wet mount:

Clue cells

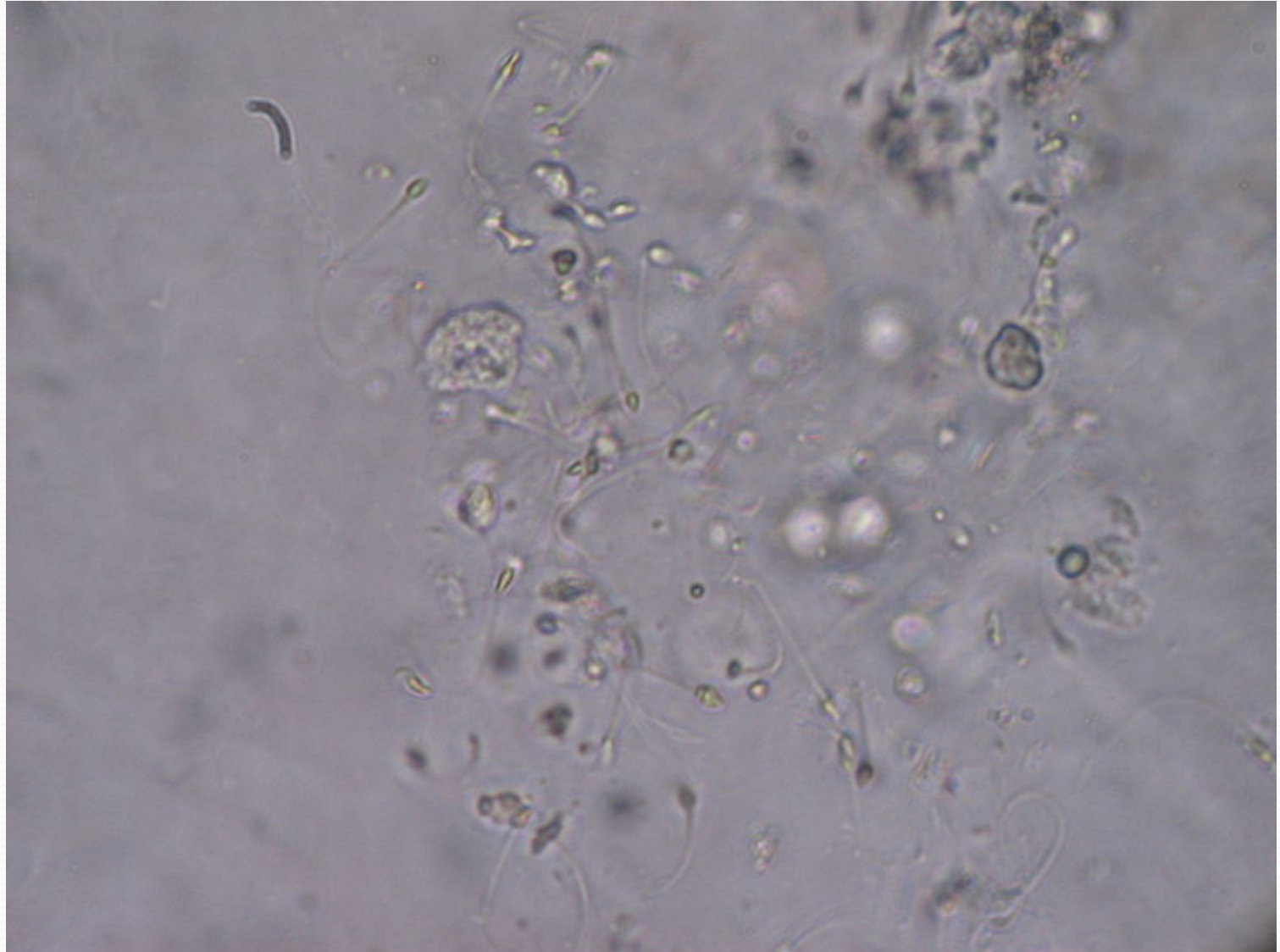


Wet mount:

Normal epithelial cells



Vaginal pool wet mount: Sperm



Vaginal pool wet mount: sperm



Wet mount:

Trichomonads



Vaginal pH

- normal: pH of 3.5 to 4.5
- pH over 4.5 is abnormal:
 - 81 to 97 % of bacterial vaginosis
 - 60 % of *Trichomonas vaginitis*
- invalid if specimen contaminated with semen, blood, douche preps, cervical secretions
- obtain from lateral fornix

Case # 2:

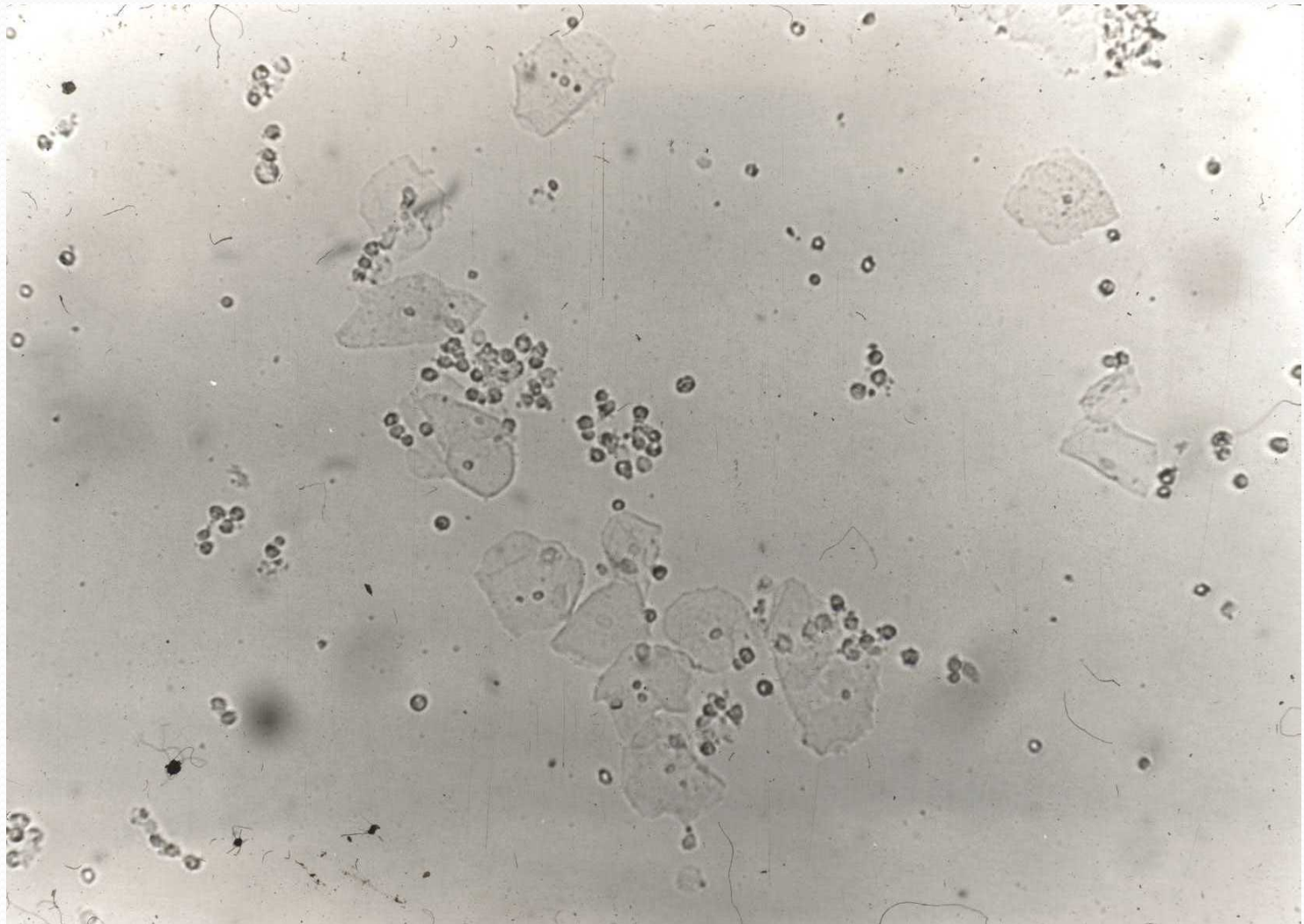
28 y/o female grad student is seen for a 5-day history of a thin greyish-white discharge associated with vaginal burning and a fishy odor.....



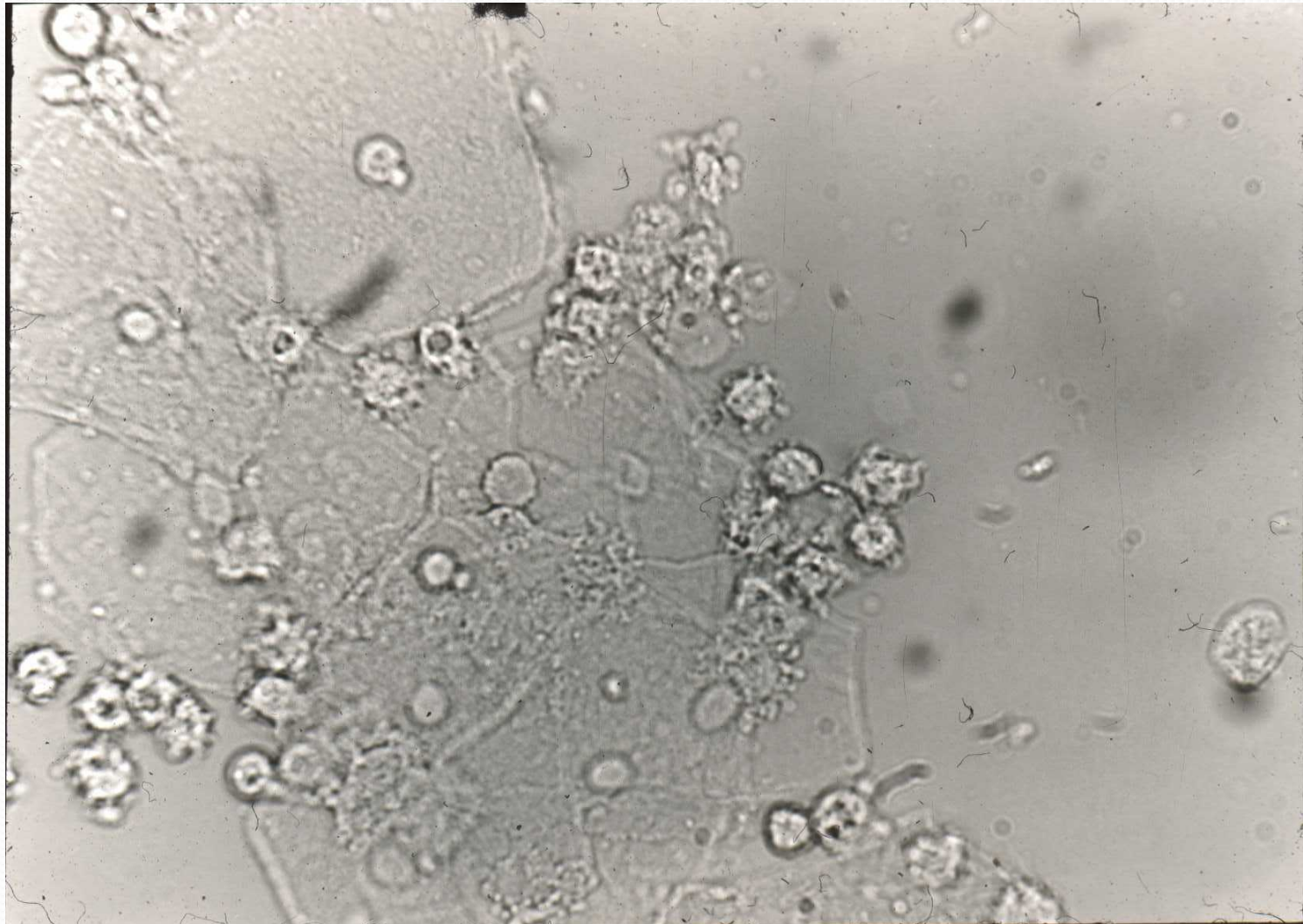
Case # 2:

28 y/o female grad student is seen for a 5-day history of a thin greyish-white discharge associated with vaginal burning and a fishy odor. A scan of the saline prep under low power shows:

Wet mount (low power):



Wet mount (high power):



Wet mount:

Vaginal epithelial cells



Case # 2:

28 y/o female grad student is seen for a 5-day history of a thin, greyish-white vaginal discharge associated with vaginal burning and a fishy odor. Microscopic exam

Whiff test: (+) . Vaginal pH: 5.5

Question # 2:

What is the diagnosis?

- a. Bacterial vaginosis**
- b. Candida vaginitis**
- c. Trichomonas vaginitis**
- d. Mixed infection**
- e. Normal discharge**

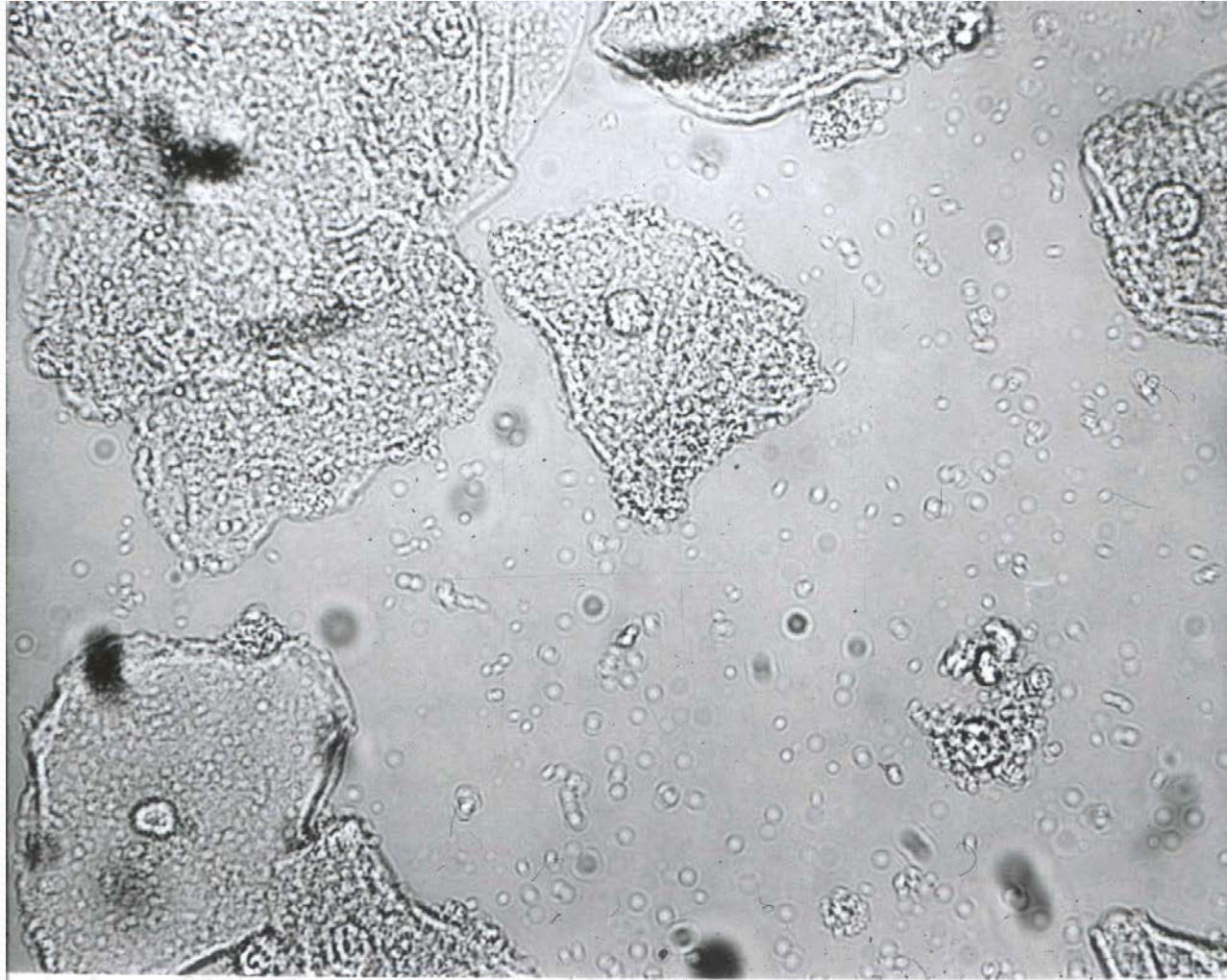
Bacterial vaginosis

Diagnostic criteria (requires 3 of the 4):

- **1. thin, homogeneous discharge**
- **2. vaginal pH over 4.5**
- **3. positive “whiff” test**
- **4. clue cells on wet mount**

Wet mount:

Clue cells



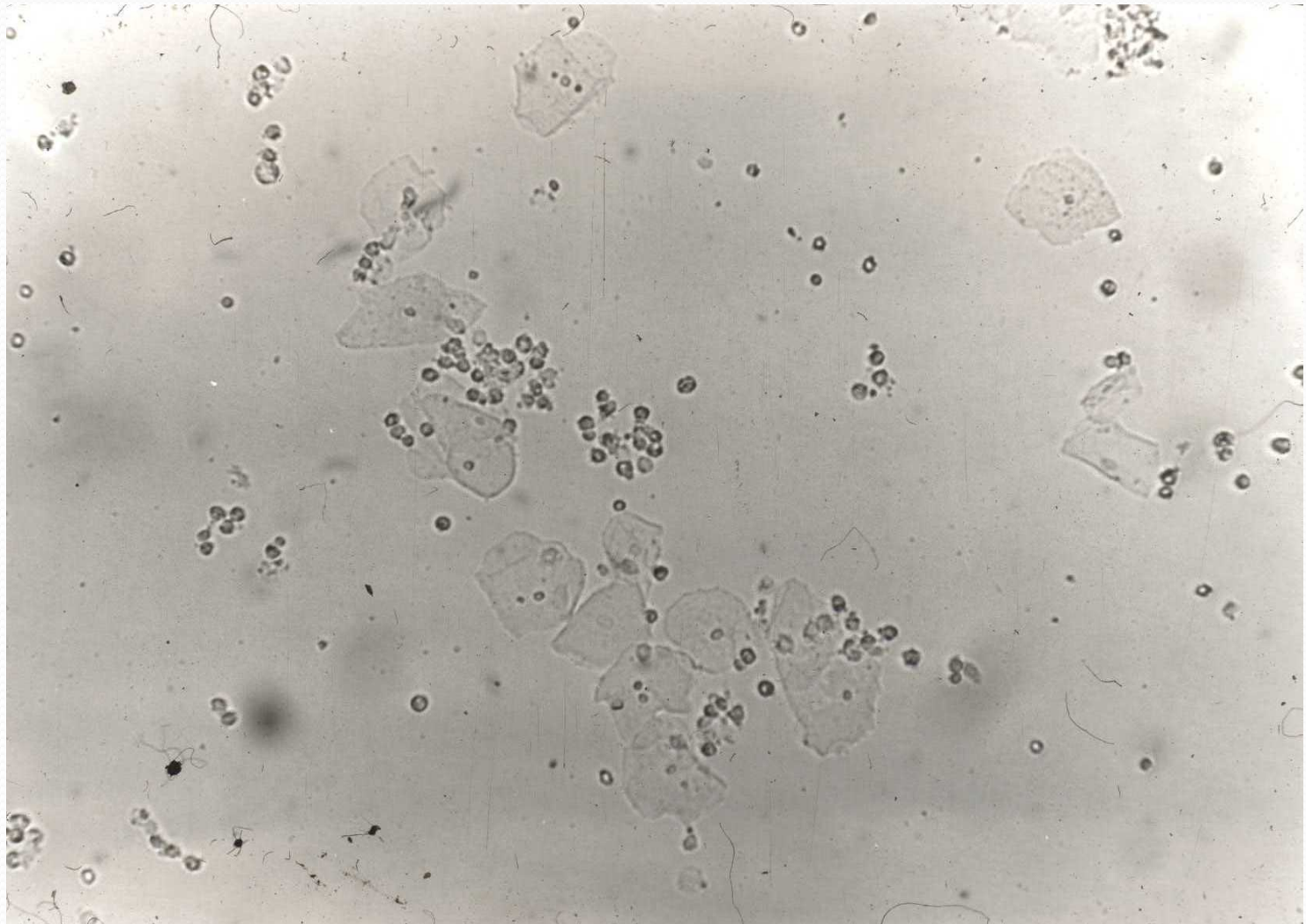
Vaginal pool wet mount

Increased number of white cells:

- **> 10 wbc/hpf**
- **> 1 wbc per epithelial cell**
- **increase in cervicitis,
trichomonas**
- **variable in candida**
- **reduced number in B. vaginosis**

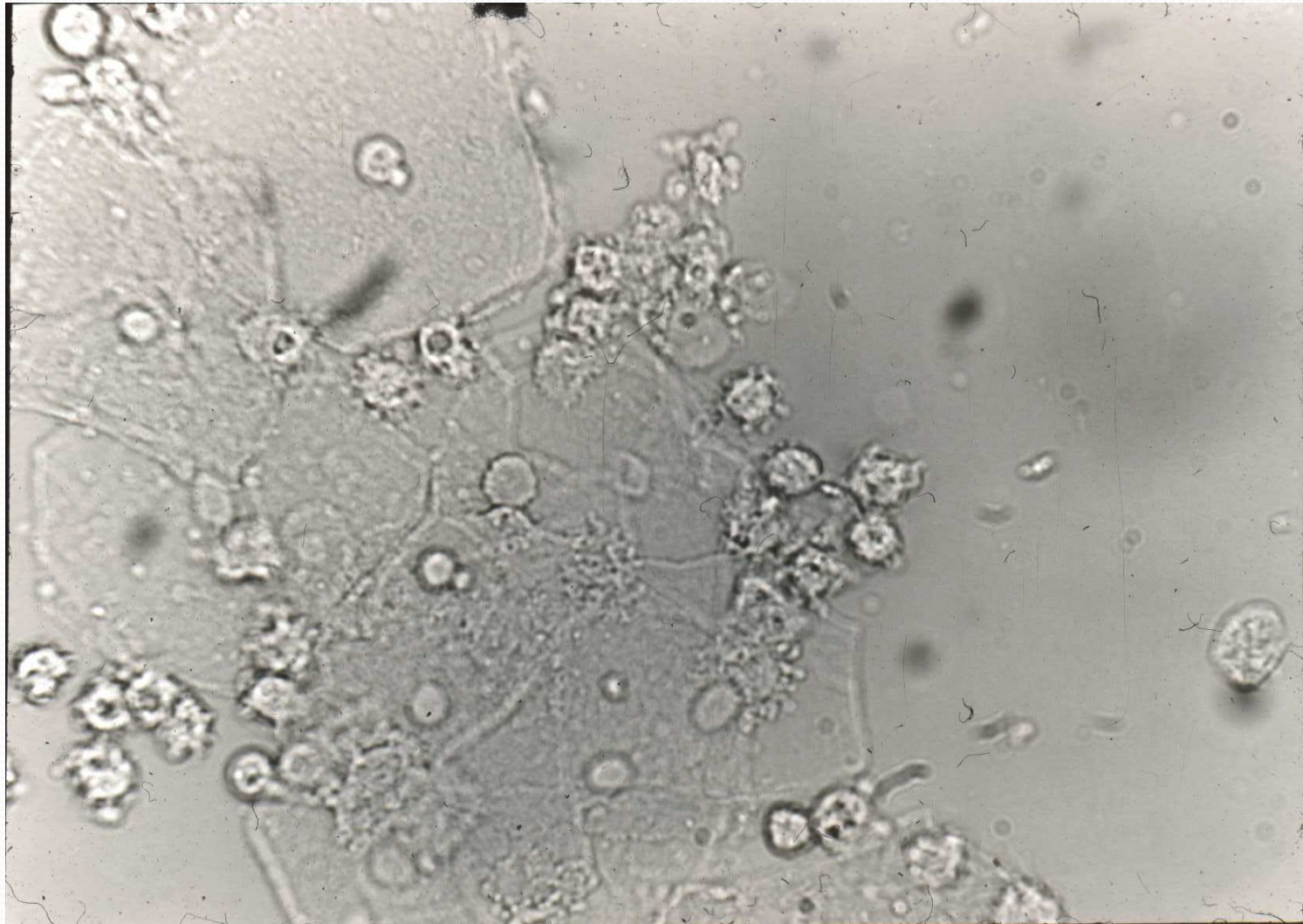
Wet mount:

Increased number of white cells



Wet mount:

Increased number of white cells



Vaginal pool wet mount

Increased number of white cells:

- **> 10 wbc/hpf**
- **> 1 wbc per epithelial cell**
- **increase in cervicitis, trichomonas**
- **variable in candida**
- **reduced number in B. vaginosis**

Mgmt of Bacterial vaginosis

- **Metronidazole- 1st generation nitroimidazole regarded by many as “drug of choice”**
- **500 mg BID x 7 days still “gold standard” (Phieffer, NEJM 1978)**

Mgmt of Bacterial vaginosis

ORAL:

- clindamycin 300 mg BID x 7 days

TOPICAL:

- vaginal metronidazole gel 0.75%: 1 applicatorful qd or bid x 5 d
- vaginal clindamycin cream 2%: 5 g q d x 7 d
- vaginal clindamycin ovules: 100 mg qhs x 3 days

Mgmt of Bacterial vaginosis

Worst-case efficacy

<u>DOSE</u>	<u>relapse after 4 wk</u>
Metronidazole 500 mg BID x 7 d	20 %
Metronidazole 2 g x 1 dose	50 %
Metronidazole vaginal gel	34 %
Clindamycin vaginal cream	42 %
Clindamycin vaginal ovules	49 %

Mgmt of Bacterial vaginosis

Tinidazole (2nd generation)

- FDA approval in 2007 for treatment of BV
- 2 grams (4 tabs) once daily x 2 d or 1 gram (2 tabs) once daily x 5 d

* 2015 STD Guidelines rec. 2 days

Mgmt of male in B. vaginosis

- **No benefit:**

- Eschenbach, Scand J Inf Dis 1983
- Swedberg, JAMA 1985
- Vejtorp, Brit J Ob Gyn 1988
- Moi, Genitourin Med 1989
- Vutyavanich, Ob Gyn 1993
- Colli, Genitourin Med 1997

- **Benefit:**

- Mengel, J Fam Pract 1989

Mgmt of Recurrent B.V.

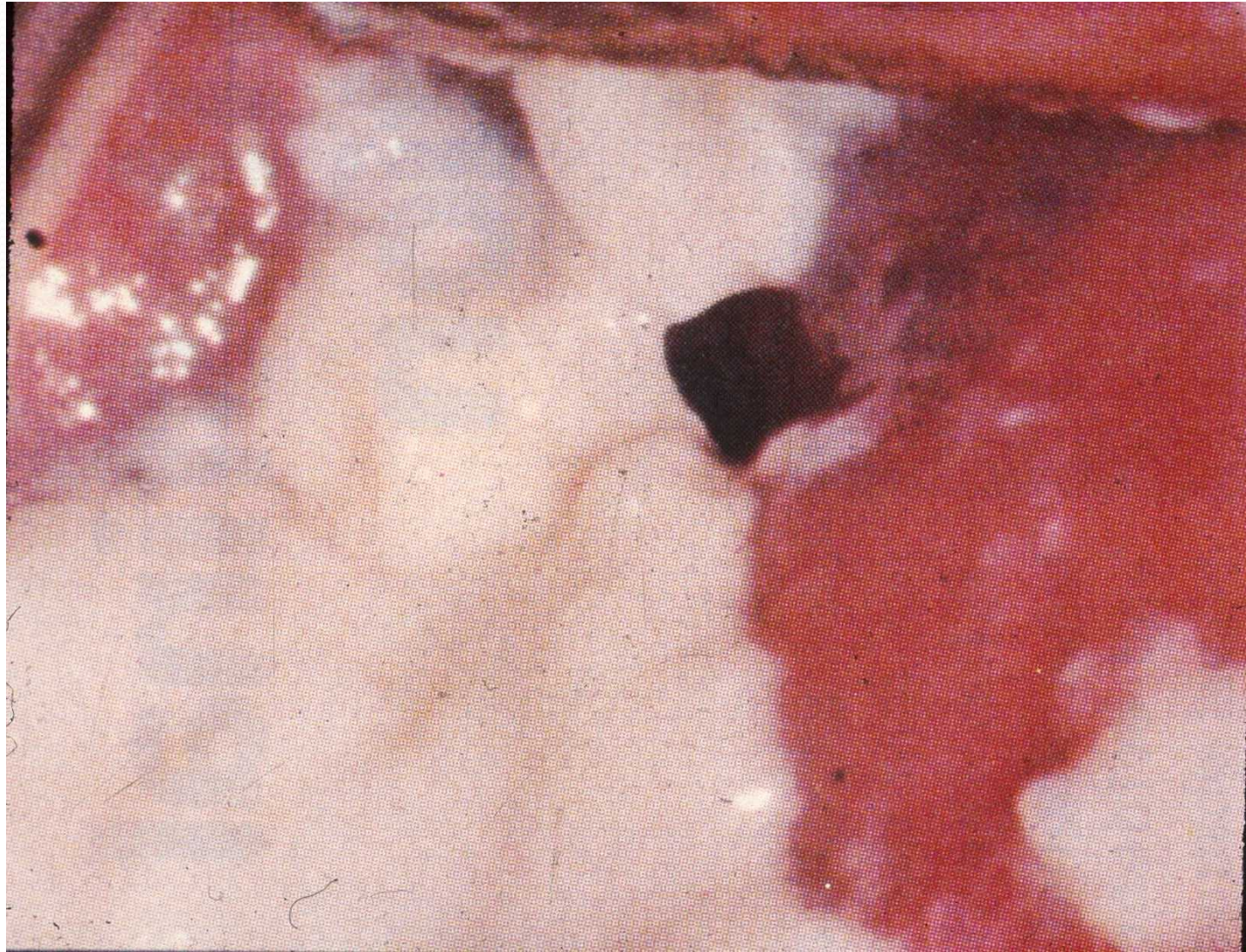
(Sobel et al, Am J Ob Gyn 2006;194:1283)

Prospective RCT of 112 women with recurrent BV following 10-day course of metronidazole gel

- 0.75% metronidazole gel BIW vs placebo x 16 weeks with 12-week post-Rx F/U
- RR = 0.43 (CI = 0.25-0.73) during Rx
- RR = 0.70 at end of 28 wk study period
- Adverse side effect: Candida vaginitis

Case # 3

A 34 years old female is seen for a one week history of a itchy, white, curd-like discharge. She notes that one week prior she was treated for a UTI with ciprofloxacin.



KOH prep:

Pseudohyphae



Mgmt: Topical imidazole agents

- **single-day regimens:**
 - clotrimazole 500 mg vaginal tab
 - tioconazole 3%- 300 mg/d x 1 d
- **3-day regimens:**
 - butoconazole 2%: 120 mg/d x 3 d
 - clotrimazole 1%: 200 mg/d x 3 d
- **7-day regimens:**
 - miconazole 2%- 100 mg/d x 7 d
 - clotrimazole 1%- 100 mg/d x 7 d

Mgmt of Candida vaginitis

- **Polyene antifungal agent:**
 - **nystatin 100,000 units/d x 7 to 14 d**
- **Triazole antifungal agents**
 - **vaginal terconazole (Terazol[®])**
cream 0.4%- 20 mg/d x 7 d
cream 0.8%- 40 mg/d x 3 d
suppository- 80 mg/d x 3 d
 - **oral fluconazole (Diflucan[®])**
single dose 150 mg. MR in 72 hrs

Mgmt of Recurrent Candida

- **identify predisposing factors**
 - **diabetes, antibiotics, medications, candida in partner, HIV infection**
- **yeast cultures**

Mgmt of Recurrent *C. albicans*

Options from 2015 CDC Guidelines

Extended course of therapy

- Topical therapy for 7 to 14 days
- Fluconazole 100-200 mg PO on days 1, 4, and 7

Maintenance 6 mo regimens:

- Fluconazole 100-200 mg PO q week*
- Clotrimazole 500 mg vaginal suppository q week
- Topical clotrimazole 200 mg BIW

* preferred

Case #4

A 44 years old nurse is seen for a 2 mo hx of recurrent “yeast” infections. She reports that despite treatment with several OTC as well as prescription yeast meds, her infection continues to recur. Her 10% KOH prep shows only:

KOH prep:



Question # 3

What is the cause of her discharge?

- A. *Candida albicans*
- B. *Candida tropicalis*
- C. *Candida glabrata*
- D. *Blastomyces dermatitidis*
- E. *Torulopsis sporium*

Vaginal pool wet mount

KOH prep: “budding spores
and the absence of
pseudohyphae”

- *Candida glabrata*
- *Saccharomyces cerevisiae*

Mgmt of *Candida glabrata*

- **Topical imidazole agent x 7-14 days**
- **Topical nystatin vaginal suppository (100,000 units) q d x 14 days**
- **Boric acid vaginal capsules 600 mg vaginal q d x 14 d**
- **Topical 17% flucytosine vaginal cream q d x 14 days**

Case # 5

28 year old housewife is seen by you for a one week history of a frothy, greenish, malodorous vaginal discharge. She also complains of dyspareunia and vaginal irritation. Vaginal pH is 6.5 and the “whiff” test is positive. Examination of cervix:





Question # 4

What is the diagnosis?

- a. Herpes genitalis
- b. Trichomonas vaginalis
- c. Mycoplasma genitalium
- d. Bacterial vaginosis
- e. Chlamydia trachomatis

“Strawberry” cervix



Vaginal pool wet mount

Trichomonas vaginalis:

- motile trichomonads
- pear-shaped, larger than WBC
- examine immediately, use fresh saline
- round up when inactive or die

Wet mount:

Trichomonads



Trichomonas vaginalis

- **common non-viral STI**
- **3 % prevalence in the U.S.**
- **3.7 million people with TV**
- **1.1 million new cases per year**

Trichomonas vaginalis

Prevalence

- **60 % more common in women, 11% in symptomatic women over 40 yrs**
- **health care disparities: 13.3% African American, 1.8% Hispanic, 1.3% white (NHES survey)**
- **settings: 32% incarcerated subjects, 17% in STD clinic**

Trichomonas vaginalis

Adverse outcomes and sequelae

- **2-3 X risk of acquiring HIV and 2X risk of transmission to infant**
- **higher risk of having CT, GC, HSV, and syphilis**
- **adverse pregnancy outcomes**
- **higher risk of PID- CDC favors TV screening in HIV-infected women**

Trichomonas vaginalis

Neglected and underdetected

- **“more than a nuisance” and remains a neglected often undetected STI**
- **asymptomatic: 70-85% with no or minimal symptoms**
- **lack of an available, sufficiently sensitive diagnostic test**

Trichomonas vaginalis

Diagnostic Tests

Vaginal cultures- “gold standard”

- cultures: Diamond's[®], InPouch TV[®], Trichosel[®]
- Sensitivity: 75-96 %
- expense, 2-7 day incubation period required

Trichomonas vaginalis

Diagnostic Tests

NAAT- e.g. APTIMA[®], BD Probe Tech TV Q[®], Xpert TV test[®]

- more sensitive than culture: 95.3- 100%
- new “gold standard”
- expense, need for specimen transport, hours to days for results

Trichomonas vaginalis

POC Diagnostic Tests

Vaginal pool wet mount:

- sensitivity: 44-68 %¹
- detection level: $>10^4$ cells/ ml²
- delay 10 min \longrightarrow 20 % \downarrow sensitivity³

Alternative POC tests:

- Nuclear acid probe test
- Rapid antigen test

1. STI 2013;89:434

2. Can J Infect Dis Med Microbiol 2005;35:38;

3. Int J STD AIDS 2003; 14:28-9

Diagnostic tests for Trichomonas

	SENSITIVITY	SPECIFICITY
Wet mount	51-65 %	
NAPT	63 %	99.9 %
RAT	82-95 %	97-100 %
Culture	75-96%	100%
NAAT	95.3-100 %	95.2-100 %

NAPT: Nucleic acid probe test

RAT: Rapid antigen test

NAPT versus RAT

TEST	SENSITIVITY	TIME TO RESULT	EQUIPMENT	CLIA
NAPT	63 %	45 min	Analyzer Instrument	CLIA moderate complexity
RAT	82-95 %	10 min	None	CLIA- waived

Diagnostic tests for Trichomonas: Sensitivity

Test Method	All patients (n = 330)	Symptoms (n=210)	No symptoms (n=120)
Wet mount	50.8 %	57.5 %	38.1 %
Culture	75.4 %	77.5 %	71.4 %
RAT	82.0 %	92.5 %	61.9 %
TMA	98.4 %	97.5 %	100 %

RAT: Rapid antigen test

TMA: transcription-mediated amplification

Huppert, et al: CID 2007;45:194-8

Mgmt of Trichomoniasis

- **Metronidazole- 1st generation nitroimidazole long regarded as “treatment of choice”**
- **Two regimens prescribed:**
 - **2 grams as single dose**
 - **500 mg BID x 7 days**
- **Single dose regimen preferred**

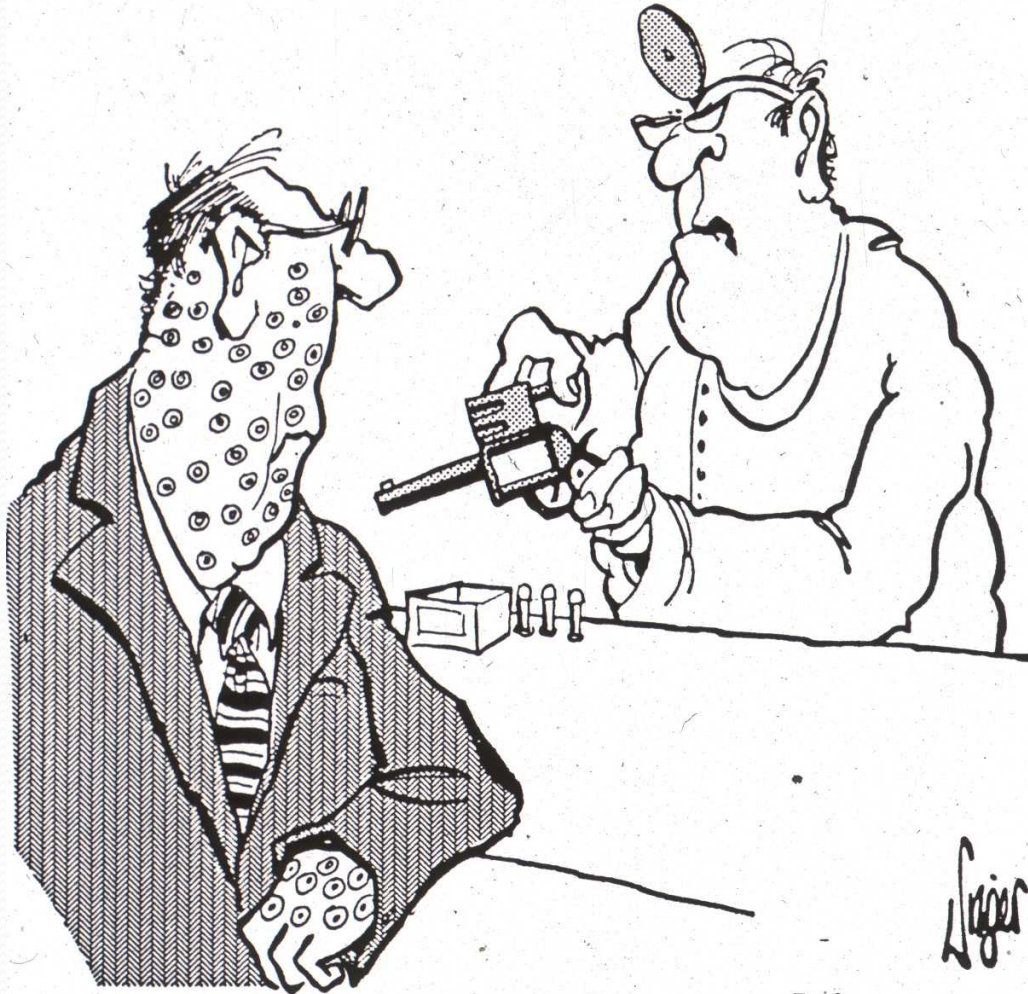
Mgmt of Trichomoniasis

Alternative to Metronidazole

- **Tinidazole (“Tindamax[®]”)**
- **FDA approval 5/04**
- **antiprotozoal agent (nitroimidazole)**
- **dose: 2 grams as single dose with food**
- **longer half-life**
- **less GI side effects**

Mgmt of Trichomonas vaginitis

- **adverse reactions: side effects including antabuse reaction (24 hr for metronidazole, 72 hr for tinidazole)**
- **use during pregnancy**
- **use in patient who is breastfeeding**
- **Trichomonas is a STD requiring STD measures**

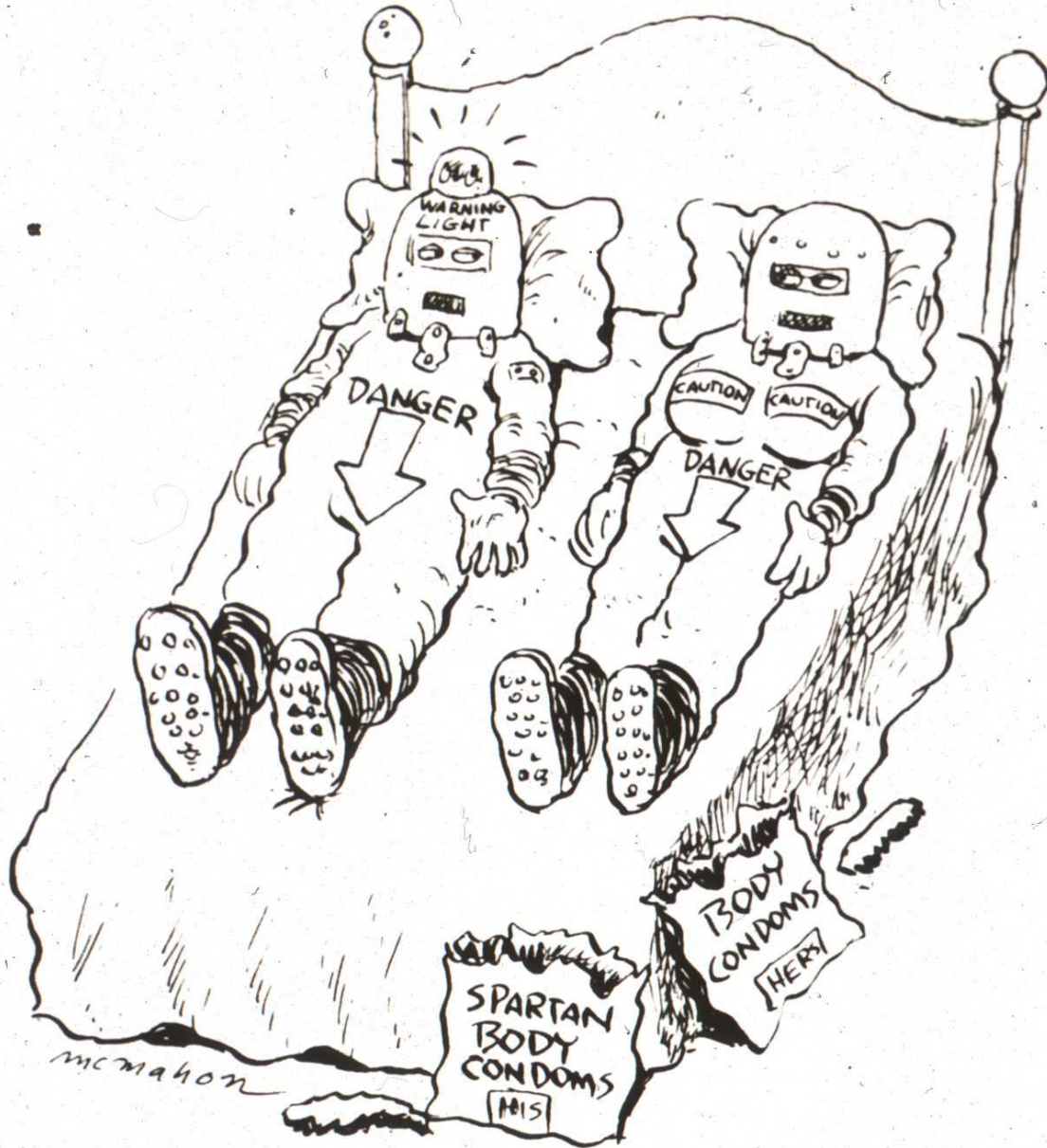


"I'm sure you'll agree, we don't want an epidemic."

Mgmt of Trichomonas

STD measures:

- **partner(s) require Rx**
- **evaluation for other STDs**
- **counseling re HIV testing and need for safer sexual practices**



Case # 6

42 years old married female attorney is seen by you for her annual physical examination. Pap smear reveals evidence for trichomonas. Her husband (of 10 years) is also a patient of yours and both he and the patient adamantly deny any instance of infidelity.

Question # 5

What is the explanation?

- a. False positive test**
- b. He cheated**
- c. She cheated**
- d. Acquisition prior to marriage**
- e. Use of public toilet**

Trichomonas on Pap smear

- **sensitivity: 60 percent**
- **specificity: 92 percent (standard Pap); 96 percent (liquid-based)**
- **Bayes theorem**

PREVALENCE

20 %-

1 in 2 is false (+)

1 % -

19 in 20 is false (+)

(9 in 10 if liquid-based*)

Trichomonas on Pap smear

- **sexual transmission**
 - recent acquisition
 - remote acquisition (dormant)
- **non-venereal transmission ?**
 - ? rare
 - isolation from fomites (i.e. toilet seat)

Trichomonas Vaginalis (con't)

Whittington MJ, Brit J V D 33:80, 1957

Vaginal material "teeming" with trichomonas

TABLE IX
TIME OF SURVIVAL (MIN.) OF *T. VAGINALIS* ON
LAVATORY SEATS

Experi- ment	Type of Seat			Control	Room Temperature (°C.)
	Bakelite	Polished Wood	Absorbent Wood		
1	45	45	20	+	+15
2	30	45	30	+	+12.5
3	45	45	30	+	+11.2
4	10	10	10	+	+10.5

Trichomonas Vaginalis (con't)

Whittington MJ, Brit J V D 33:80, 1957

Patients with heavy T. Vaginalis infections asked to "pass water" in water closet

TABLE X
CONTAMINATION BY *T. VAGINALIS* OF LAVATORY SEATS

Total No. of Patients		Sat on Seat	
		Yes	No
30		17	13
Seat Dry after Use		11	8
Material left on Seat after Use	<i>T.v.</i> positive	2	2
	<i>T.v.</i> negative	4	3

Vaginitis: Meeting the Clinical Challenge

- **common gynecologic problem**
- **key to management is accurate diagnosis**
 - **history and examination**
 - **office lab: wet mount, pH, “whiff test”, Q-tip test**
- **specific dx allows for effective Rx**

