Diagnosis of Vaginal Conditions

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SAS Conference 2018



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DIAGNOSIS OF VAGINAL CONDITIONS

Phillip Hay

Vaginal Physiology

- pH 4.0 4.5
- Lined by stratified squamous epithelium
- Lactobacillus dominated flora
- Puberty onwards
- Atrophic change after menopause
- Fluctuation over the menstrual cycle





What is "normal"?

Changes in consistency and amount

during cycle



Candida

- Bacterial vaginosis
- Trichomonas Vaginalis
- Foreign body
- Atrophic vaginitis



Fig. 1. Prevalence of all diagnosis performed in a vulvo-vaginal clinic: An annual cohort of 297 primary visits of women complaining of genital discomfort: pruritus, discharge, dyspareunia and malodor.

Orna Reichman, Hemda Luwisch, Hen Y. Sela, Arnon Samueloff

Genital discomfort: yeast, trichomonas and bacterial vaginosis are only the tip of the iceberg

European Journal of Obstetrics & Gynecology and Reproductive Biology, 2017, Available online 3 May 2017

http://dx.doi.org/10.1016/j.ejogrb.2017.04.049

Dermatological causes

- Eczema
- Lichen sclerosus
- Lichen simplex
- Other eg lichen planus, psoriasis, sarcoidosis, pemphigus, Crohn's

Cervical/Uterine causes

- Chlamydia
- Gonorrhoea
- Ectropion
- HSV
- Neoplasm



44 year old woman

- 1/12 vaginal soreness, discharge greenish at times, thick, not-offensive
- RMP 15 years, no others
- Thick yellow discharge
- BV grade 4



26 year old woman

- Frequent thrush, not responded to 'Canesten duo' several times
- Worse around menstruation
- White discharge pH 4.0
- BV 1, no candida

Other Vaginal causes

Inflammatory

- Lichen planus
- DIV
- Atrophic
- Cytolytic





George Papanicolaou

- SymptomsClinical signs
- ∎ pH
- Wet Mount
- Gram stain
- Lab tests



Herman L Gardner



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Desquamative inflammatory vaginitis

Orna Reichman, MD, MSCE^{a,*}, Jack Sobel, MD, Chief, Professor of Medicine^{b, 1}



Desquamative Inflammatory Vaginitis

- A clinical syndrome of purulent vaginitis; exclusion of other conditions that cause purulent vaginitis is essential to confirm diagnosis.
- DIV resembles other inflammatory-mediated skin disease of the genitalia and responds well to anti-inflammatory treatment.
- Either local vaginal 2% clindamycin or vaginal corticosteroids are adequate treatment.
- DIV is a chronic condition and some patients will need maintenance treatment



Vaginal Epithelium

- Squamous epithelium
 - Superficial cornified layer
 - Middle layer
 - Deep Layer parabasal and basal cells
 - Subepithelial layer
 - Muscle layer



Bacterial Vaginosis Curriculum

Wet Prep: Bacterial Vaginosis

Saline: 40X objective



Source: Seattle STD/HIV Prevention Training Center at the University of Washington

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Diagnosis









Diagnosis of BV

- 👎 두 Amsel's criteria
 - Gram stain
 - Nugent score
 - Hay-Ison
 - Commercial assays
 - Sialidase
 - NAAT tests

Hay-Ison Criteria

- Grade 0 No bacteria
- Grade 1 Lactobacillus dominated
- Grade 2 Lactobacilli and gram-ve cocci
- Grade 3 Overgrowth of gram-ve cocci and other

morphotypes

• Grade 4 – Gram+ve cocci

Candidiasis Curriculum

PMNs and Yeast Pseudohyphae

Saline: 40X objective



Source: Seattle STD/HIV Prevention Training Center at the University of Washington

Diagnosis

Candidiasis Curriculum



Yeast Pseudohyphae



Lysed squamous epithelial cell

Source: Seattle STD/HIV Prevention Training Center at the University of Washington

Candidiasis Curriculum

PMNs and Yeast Buds

Saline: 40X objective



Source: Seattle STD/HIV Prevention Training Center at the University of Washington

Diagnosis

Diagnosis of Candida

- Symptoms and signs
- Gram stain
- Culture
- Drug susceptibility

Trichomoniasis Curriculum

Wet Prep: Trichomoniasis

Saline: 40X objective



*Trichomonas shown for size reference only: must be motile for identification *Source*: Seattle STD/HIV Prevention Training Center at the University of Washington Diagnosis

Diagnosis of Trichomoniasis

Wet mount sensitivity 40-80%

Immunochromatographic assay about 60%

Culture 60-80%

NAAT 100%

Atrophic vaginitis

Mature Squamous cell



Fig. 2. Upper intermediate cells/lactobacilli rods/no leukocytes ($200 \times$ magnification).

Parabasal cells



Fig. 3. Atrophic vaginitis in a postmenopausal patient ($200 \times$ magnification).





ı D

cells in the endometrium (the blood-rich lining of the uterus that is she

Cytolytic smear. Note the absence of intact squamous cells, bare nuclei

Bare

nuclei

Lactobacilli

Cytolytic Vaginitis

- Characterized by pruritus, dyspareunia, and vulval dysuria.
- Cyclical increase in symptoms is more pronounced during luteal phase.
- 15/210 women with vaginal discharge and other symptom/signs of genital pathology suggestive of vulvovaginal candidiasis in one series
- 5/101 in another

Donders' Scoring System

AV Score	0	1	2	
Lactobacilli	Dominant	Mixed	Absent or in a minority	
Leukocytes	< 10/hpf	10/hpf and < 10/epithelial cell	> 10/epithelial cell	
% toxic leuks	None or occ	< 50% leuks	> 50% leuks	
Flora	Unremarkable	Small coliform	Cocci or chains	
% parabasal	< 1%	< 10%	> 10%	

Score 3-6 mild or moderate aerobic vaginitis
Score > 6 = severe aerobic vaginitis or DIV

Microbiology of 'AV'

Vaginal fluid constituents	No AV	Mild AV	Moderate severe AV	Bacterial vaginosis (BV)
	n = 533	n = 48	n = 50	n = 38

Candida sp.	36 (6.7)	7 (15)	3 (6)	7 (18)
Gardnerella vaginalis	45 (8.5)	11 (23)	10 (20)	24 (63)
Group B streptococci	30 (5.8)	5 (10)	12 (24)	1 (3)
Staphylococcus aureus	5 (0.9)	0	2 (4)	0
Escherichia coli	27 (5.1)	8 (17)	8 (16)	2 (5)
Enterococci	46 (8.6)	9 (19)	6 (12)	4 (16)
Trichomonas vaginalis	2 (0.4)	2 (4)	6 (12)	1 (3)
Any of the above except Candida sp.	143 (27)	28 (58)	33 (66)	34 (89)

Putting it all together

- Symptoms
- Clinical signs
- ∎ pH
- Wet Mount
- Gram stain
- Lab tests



- Inflammation itch, soreness, pain
- Discharge –consistency, colour
- Smell
- External vulval/perineal involvement
- (lack of) Response to previous treatments



- Discharge
- Smell
- Cervical appearance/contact bleeding
- Vaginal epithelial integrity/skin involvement
 Foreign body

Wet Mount

- Epithelial Cells: Mature squamous, Clue cells, parabasal cells, cytolysis
- White cells: pmns, toxic pmns
- Bacteria: Long rods, cocci, chains of cocci, coliforms, small rods
- Candida: spores, budding yeasts, pseudohyphae, hyphae
- TV

Gram stain

- Epithelial Cells: Mature squamous, Clue cells, Parabasal cells
- White cells: pmns, (toxic pmns)
- Bacteria: Long rods, cocci, chains of cocci, coliforms, small rods
- Candida: spores, budding yeasts, pseudohyphae, hyphae
- (TV)



- Non-inflammatory
 - BV, Atrophic, Cytolytic

Reporting

- pH e.g. 4.5
- PMNs 0 1 (+) 2 (++) 3 (+++)
- TV N or P
- Candida Neg S (spores) P (hyphae)
- Bacteria BV 0-4
 - Other: chains of cocci, coliforms, small rods
- Epithelial cells Normal parabasal <10 %, > 10%
 Cytolysis 0 + ++



TV NAAT!



















- Hay- Ison Grade 2
- Reduced/absent lactobacilli
- Usually GPC and other bacteria
- Not really BV (No clue cells on wet mount)



Cervicitis and Inflammatory Flora



Inflammatory flora and Candida



Assessment			
Vag infections Summary Presentation Assessment Previous STIs Examination Mx and coding	Treatment Audit		
pH	1 2 3 4 5	6 7 8 ▶ Q. ▼ STG - Vaginal report - last 8 visits only (EPR846) 14/11/2016 Visit Site CCGUM) Refresh Assigned Clinician Dr Phillip Hay
Vaginal microscopy PMNs Toxic forms	Presenting details	Much improved. Has stopped using always panty liners Full candida sensitivities awaited from Bristol. Has to go to Taiwan as father not well.	
Candida 🔽 N Negative BV slide 🔽 1 Normal TV slide 🔽 N Negative	Examination findings	period just started no external inflammation	POCT results pH: PMNs: Toxic forms:
Epi cells Cytolysis Clue cells	Diagnosis	persistent resistant C. albicans	Candida: Negative BV slide: Normal TV slide: Negative Details: occ pus
Details occ pus - Sperm - Chains of cocci - Coliforms - Small rods	Management and planning	nystatin 100,000 IU nocte 6/7, keep remainder of pack for next episode. dispensed from pharmacy maintenance with clotrimazole P. 500 mg weekly 6/52 review 2-3/12.	Epi cells: Cytolysis: Clue cells:
✓aginal NAATs Sent? ✓aginal candida culture Sent? Antifungal sensitivities required? ■ ✓aginal M,C&S Sent?	Dispensed treatments	Clotrimazole 500mg Pessary	Laboratory results Candida ¥aginal M,C&S TV: GBS: BV: Yeasts: Details:

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Cohort

250 Women presenting with vulvo-vaginal symptoms 28 August 2016 – 30 September 2017 Age 15 – 68, Mean 29.03, median 27

White	125
Black Caribbean	51
Black African	27
Other	47



Personal Series 250 Walk-in Patients

BV	81	Eczema	7	
BV and Candida	7	Cytolytic	5	
BV Asymptomatic	10	Atrophic	3	
Candida	69	DIV	2	
HSV	21	LSA	2	
TV	11	Retained tampon	2	
Physiological	10	Other	4	
Cervicitis/NSGI	8	Uncertain	8	

Why is there pus?

TABLE 4 Diagnostic techniques for the detection of Trichomonas compared to nucleic acid amplification tests^a

Method or target	% Sensitivity	% Specificity	% PPV	% NPV
Culture ^b	93 (38/41)	100 (205/205)	100 (38/38)	99 (205/208)
Motile trichomonads	51 (21/41)	98 (200/204)	84 (21/25)	91 (200/220)
Leukorrhea on microscopy ^c	78 (32/41)	51 (102/199)	25 (32/129)	92 (102/111)
Motile trichomonads or leukorrhea	78 (32/41)	53 (109/207)	25 (32/130)	92 (109/118)
PMNLs on Gram staining ^d	90 (37/41)	33 (68/207)	21 (37/176)	94 (68/72)

" Parenthetical numbers are no. of correct results/no. tested. PPV, positive predictive value; NPV, negative predictive value.

^b InPouch Trichomonas culture was more sensitive and specific than microscopy for the diagnosis of Trichomonas.

^e Leukorrhea, ≥1 PMNL per epithelial cell per hpf (×400).

^d PMNLs on Gram staining, ≥1 PMNL per hpf (×1,000).

Why is there pus?

_ Candida	45	4 with NSGI
CT/NG/PID/NSGI	32	
HSV	9	
TV	9	
Uncertain	7	
Atrophic	2	
DIV	2	
other	6	
	112	



Recognise `Inflammatory flora'
 Grade 4b?

- Look at the cytology as well as the organisms
 - Cytolysis, parabasal cells, pmns
- Why is there pus?

Final diagnoses

- Physiological
- Inflammatory with PMNs
 - Candida, TV, cervicitis, DIV, Atrophic
 - Ectropion, Dermatoses, HSV
- Non-inflammatory
 - BV, Atrophic, Cytolytic, Foreign body
- Post-coital or post antibiotic sample