

Gonorrhea Potpourri

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*No commercial disclosures
or conflicts of interest

Case 1

15 yo female with recurrent GC

Social Hx

- May 2021: 1 lifetime sex male partner, unable to be reached for treatment

May 2021

Presents to SBHC: **positive for CT/GC on urine NAAT**

Treated with ceftriaxone 500 mg IM x 1 dose + doxycycline 100 mg PO bid x 7 days

Sept – Oct 2021

Presents to CHC: **positive for CT/GC on urine NAAT**

Denies interval sexual activity

CHC asks SBHC to find pt and we advise the following re-testing:

Exam: **vaginal discharge**, no abd pain

DPH advises the following testing: **positive rectal+vaginal GC culture** (via Eswab-type transport media) and **positive urine CT/GC NAAT**, and negative OP CT/GC NAAT

Sept 2021: public health department asked whether this could be resistant GC

 National Network of
STD Clinical Prevention
Training Centers

How do you guide clinicians to obtain GC culture in your state?

Outpatient Options for GC Culture



Candle jar
(how STD clinics used to do this)



Inoculation in selective media kit
(hard to find)



Commonly available because
Eswabs are used for strep throat
cultures - and can be used for GC
(yield may not be as high)

Case 1 (continued)

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DPH advises the following testing: positive rectal+vaginal GC culture (via Eswab-type transport media) and positive urine CT/GC NAAT, and negative OP CT/GC NAAT
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"Gets better"
Culture not subbed properly at outside lab, so susceptibilities never run by State Lab

Sept 2021: public health department asked whether this could be resistant GC

Case 1 (continued)

15 yo female with recurrent GC

Social Hx

- May 2021: 1 lifetime sex male partner, unable to be reached for treatment
- Jan 2022: reports another new male partner

May 2021

Presents to SBHC: positive for CT/GC on urine NAAT

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Presents to CHC: positive for CT/GC on urine NAAT

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CHC asks SBHC to find pt and we advise the following re-testing:

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"Gets better"

Culture not subbed properly at outside lab, so susceptibilities never run by State Lab

Jan 2022

SBHC brings her back for f/u testing

Positive for CT on self-swab vaginal NAAT ...

Sept 2021: public health department asked about whether this could be resistant GC



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Case 2

Asked to provide public health perspective on a case of DGI




Neisseria gonorrhoea:
Diagnosis, treatment and emergence of
antimicrobial resistance

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April 27, 2022

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History of Present Illness

A 52-year-old man with previously well-controlled HIV diagnosed in 2010.

1/27

- On DOR/3TC/TDF -> off ART for several months
- HIV-1 VL 101,000, CD4 730 cells/uL -> started BIC/TAF/FTC
- RPR titer 1:8 – penicillin G 2.4 million units IM

2/8

- Rectal chlamydia swab, pharyngeal gonorrhea swab positive
- Ceftriaxone 500 mg IM x 1 + doxycycline 100 mg q12h x 7 days

2/24

- Rectal chlamydia, pharyngeal gonorrhea swab negative
- RPR titer 1:8
- HIV-1 VL 153

History of Present Illness

PMH

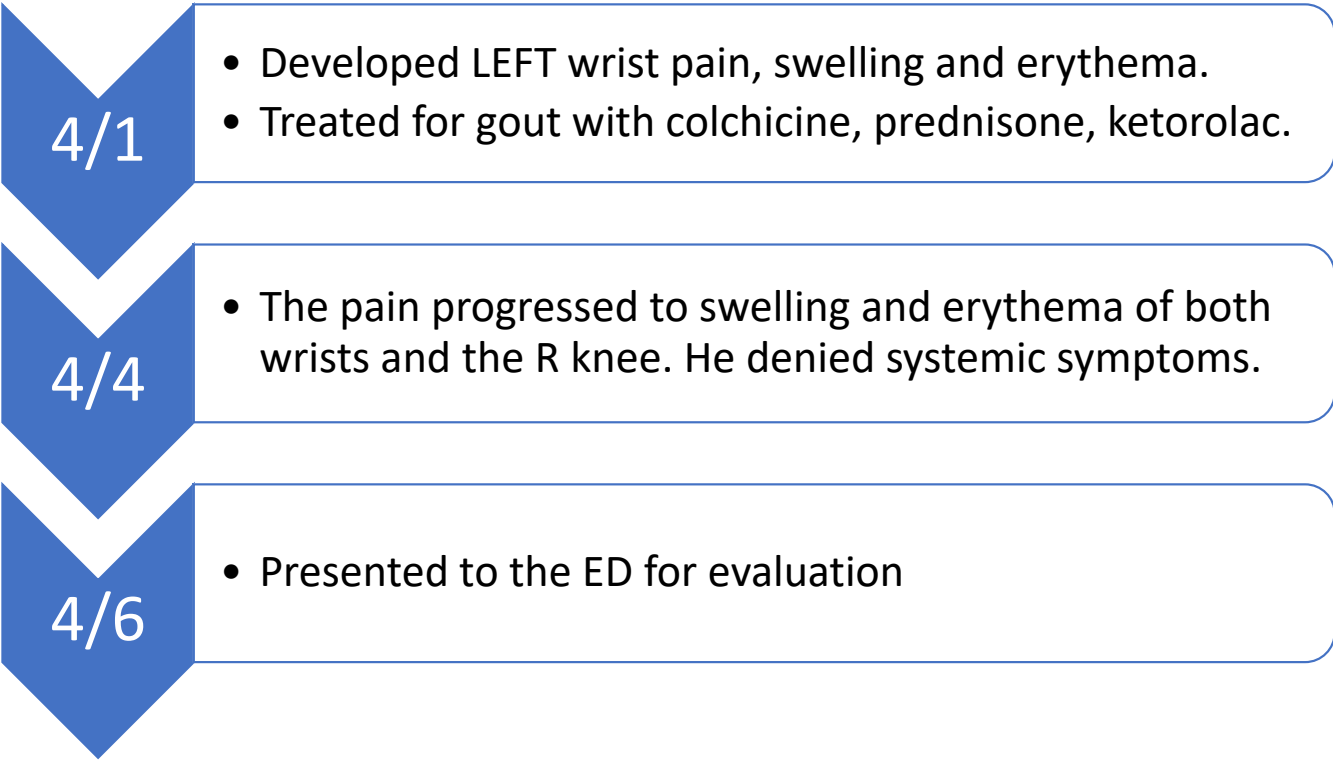
HIV
Syphilis x 2

Social History

Lives in Peabody
Works in accounting
MSM – last encounter in 1/2022
prior to treatment for gonorrhea,
chlamydia and syphilis. No sexual
encounters since

Medications: BIC/TAF/FTC

Allergies: NKDA



Physical Exam

T 36.9 °C | HR 80 | BP 130/65 | RR 14 | SpO2 98 % on RA

HEENT: NCAT, no scleral icterus or oral lesions

Lungs: CTAB, no wheezes, or crackles

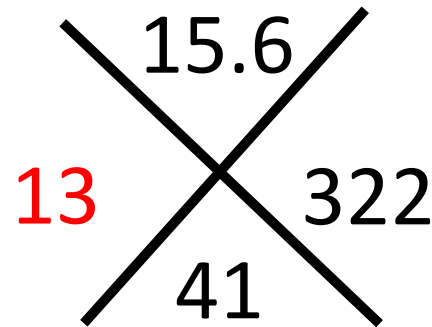
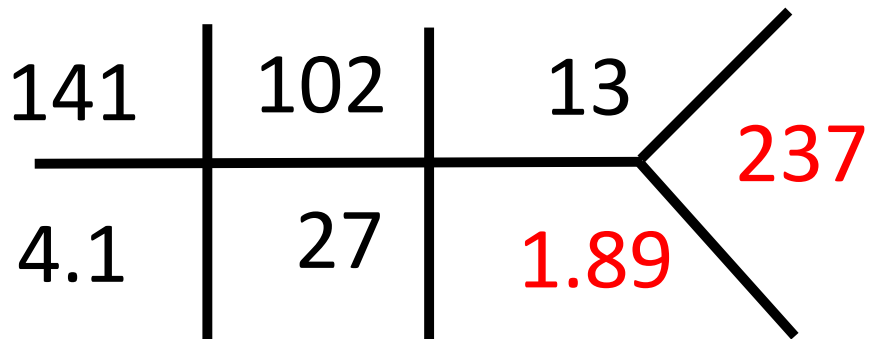
Cardiac: RRR, no m/r/g

Abdomen: Soft, NTND, no hepatosplenomegaly

R hand: trace edema without erythema. TTP at the wrist with limited ROM

L hand: significant edema throughout the entire hand, no erythema. TTP at wrist with limited ROM

R knee: moderate edema with minimal erythema. ROM was full but painful



N: 63.9
 L: 21.8
 M: 8.8
 E: 0.7
 B: 0.8

AST	25	HIV VL	42
ALT	21	Quant RPR	1:8
Alk Phos	664	Lyme	negative
T. Bili	0.3		
ESR	89		
CRP	185		

Arthrocentesis

	L Wrist	R Knee
Color	Yellow	Pink
Turbidity	Hazy	Turbid
Nuc cells	43,559	93,600
Neut	99%	94%



Clinical progression

He goes to the OR for washout of both wrists and the right knee. Gram stain shows 4+ PMNs but no organisms, and cultures are negative.

He is started on vancomycin, cefepime for empiric coverage of septic arthritis.

A diagnostic test results: **a nucleic acid amplification test from the pharyngeal swab is positive for gonorrhea.**

Transitioned to ceftriaxone 1 g IV q24h and doxycycline 100 mg po bid for coverage of presumed disseminated gonococcal infection.

Additional Inpatient Options for GC Culture



Blood culture

Clinical Rheumatology (2020) 39:275–279
<https://doi.org/10.1007/s10067-019-04740-w>

ORIGINAL ARTICLE

Check for updates

Synovial fluid culture: agar plates vs. blood culture bottles for microbiological identification

Daniel Cohen¹ · Ayman Natshe² · Eli Ben Chetrit^{3,4} · Ehud Lebel^{1,4} · Gabriel S. Breuer^{2,4} 

Received: 27 June 2019 / Revised: 31 July 2019 / Accepted: 4 August 2019 / Published online: 6 September 2019
© International League of Associations for Rheumatology (ILAR) 2019

Abstract

Objectives Bacteriological diagnosis of septic arthritis (SA) is complicated. Agar plates are the main culture method and yields 40–60% of positive bacterial detection. Addition of bottled culture broth (Bactec®) as a method for detecting synovial microorganisms is common. The advantages of this method and the combination of both have not been thoroughly investigated. This study evaluates an added value of the Bactec culture broth as a single method or as combined with the agar-plate culture.

Methods All culture aspirates of SA-suspected patients were analyzed. All cases with a positive result by either method were reviewed for background data and clinical diagnosis.

Results Out of 5000 synovial fluid samples, a clinical diagnosis of SA was suspected in 1024 cases. Samples processed by both culture methods were extracted during the same event. Bactec® vials were positive for significant bacterial detection in 113/148 cases (76.4%) while agar-plate cultures were positive in only 96/154 (62.3%) representing higher sensitivity of 0.5 vs. 0.42 and a positive predictive value (PPV) of 0.76 vs. 0.62. Bacterial detection by both methods combined was positive in 137/221 (62%) and did not achieve a significant increment.

Conclusions The Bactec® method has many advantages in bacteriological identification of synovial infection, including a broader identification spectrum, faster response time, and superior qualities of identification although being more expensive. This method has a better yield in detecting septic arthritis and might be considered a single method for synovial fluid culture in cases suspected for SA.

Key Points

- The Bactec method had improved detection rates.
- Culturing by agar plates and Bactec revealed higher sensitivity and lower specificity.
- The use of the blood culture bottles (Bactec system) alone will raise the detection rate of septic arthritis with lower false positive rates and at lower costs.

Synovial fluid: inoculate into blood culture media for better yield

Current FDA-approved NAATs, 2019

Assay (Company)	Ng Targets	Cleared Specimen Types
Abbott RealTime CT/NG (Abbott)	Opa gene	Women: urine, swabs (vaginal, endocervical) Men: urine, urethral swab
cobas CT/NG (Roche)	Two different targets in the DR 9 region	Women: urine, swabs (vaginal, endocervical) Men: urine
APTIMA Combo 2 Assay (Hologic)	16S-rRNA	urine swabs (vaginal, endocervical, urethral, rectal, pharyngeal)
BD MAX GC BD MAX CT/GC BD MAX CT/GC/TV	OpcA gene	urine (20-60mL of first morning urine recommended), swabs (vaginal endocervical)
BD ProbeTec Neisseria gonorrhoeae (GC) Qx Amplified DNA Assay	Pilin-gene inverting protein homologue	Women: urine, swabs (vaginal, endocervical) Men: urine, urethral swab
BDProbeTec ET Chlamydia trachomatis and Neisseria gonorrhoeae Amplified DNA Assays	Pilin-gene inverting protein homologue	Women: urine, endocervical swab Men: urine, urethral swab
Xpert CT/NG (Cepheid)	Two distinct chromosomal targets	urine swabs (vaginal, endocervical, rectal, pharyngeal)
binx io CT/NG Assay (binx health)	Not specified	vaginal swabs



Hologic.com

Thomas Meyer & Susanne Buder. The Laboratory Diagnosis of Neisseria gonorrhoeae: Current Testing and Future Demands. *Pathogens*. 2020 Jan 31;9(2):91.

Utility of NAAT on other sample types (not FDA-approved)



Evaluation of the Hologic Aptima Combo 2 Assay for Detection of *Neisseria gonorrhoeae* from Joint Fluid Specimens

David C. Alexander,^{a,b} Robert M. Taylor,^b Irene Martin,^c Heather Adam,^{b,d} Philippe Lagacé-Wiens,^{b,d} Peter Pieroni,^d James A. Karlowsky,^{b,d} Paul Van Caesele^{a,b}

TABLE 1 Summary of Aptima Combo 2 and culture results for 170 joint fluid samples

Aptima Combo 2	Culture	Organism	Joint							Total	
			Knee	Hip	Elbow	Ankle	Shoulder	Wrist	Not recorded		
GC positive	Positive	<i>Neisseria gonorrhoeae</i>	4						1	5	
	Negative		8		1					9	
GC negative	Positive	<i>Staphylococcus</i> sp.	14	4	2		2			1	23
		<i>Streptococcus</i> sp.	5					2			7
		<i>E. coli</i>	4								4
	Negative	Other bacteria	3	1		1		1		2	5
			93	8	7	4	1		2	2	117

Alexander et al., *J Clin Microbiol*, 2022

Treatment

- Given ambiguity regarding whether this represented resistance or re-infection, we transitioned to ertapenem 1 g IV q24h and planned for a total 2-week course of therapy.
- Cultures ultimately resulted negative. Aspirate of the R knee was **sent to University of Washington for sequencing and returned positive for *Neisseria gonorrhoeae***, confirming the diagnosis of DGI.
- He clinically improved. Will be seen in f/u this week.

Take-Home Points

- With increasing case numbers of GC, questions about GC resistance are likely to come up more
- Enabling clinicians to use local resources to perform GC culture will be crucial
- Monitor GC diagnostics: they may include not-yet-FDA-approved sample types and tests
- Systematically receiving isolates at the state level will be important for surveillance
 - Sequencing of strains
 - Resistance profiles