

“TB or NAAT TB....that is the Question” – a confounding case study from Minnesota

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September 2014 - Patient Background

- 55 year old female – born in Cambodia
- Came to U.S. to stay with daughter in Minnesota
- 2010: treated for TB in Cambodia
- Brought treatment card
 - Rifampin, INH, PZA, Ethambutol
 - Exact doses unknown
 - Treatment for 7 months

September 2014 - Patient Background

- As new immigrant – overseas exam = TB Class B1
 - Had abnormalities in chest X-ray
 - Have to get in touch with PH and get a domestic follow-up assessment exam
- County PH “A” – refers to local Dr.
 - Quantiferon +
 - Abnormal chest X-ray
 - Worsened since overseas exam

October 2014 - Patient Background

- Patient Having Symptoms
 - Having night sweats, cough, fever, really sick
 - No insurance
- County PH “B”
 - Collects sputum x3



October 2014 – Sputum Prelim Results

- **10-10-2014:**
 - Smear negative
- **10-11-2014:**
 - Smear 1+ positive
 - Direct MTBC PCR +
- **10-12-2014:**
 - Smear 1+ positive
- Treatment started Oct.15th, 2014
- Treat with 4 drug regimen for 6 months



November 2014 – Culture Results

- **10-10-2014:**
 - Smear negative
 - Culture = *M. gordonae*
- **10-11-2014:**
 - Smear 1+ positive
 - Direct MTBC PCR +
 - Culture = *M. fortuitum*
- **10-12-2014:**
 - Smear 1+ positive
 - Culture = no growth

Curry TB Center in CA - Webinar

- Experts weigh in...
 - MDH TB Control asked about the meaning of her + NAAT in view of eventual cultures not growing MTBC
 - Experts* not convinced the NAAT could remain + for so long after initial treatment (4 years) – but rare instances exist of + NAAT after 2 years later with culture remaining negative



*Curry TB Center in CA - webinar

Analysis. Answers. Action.

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Oct. 2014 to Jan. 2015 - Results

- **10-22: smear 1+ →** culture neg. (extra 2 wks incub)
- **10-28: smear neg. →** culture neg. (extra 2 wks incub)
- **10-31: smear neg. →** culture neg. (extra 2 wks incub)
- **11-5: smear neg. →** culture neg.
- **12-12: smear 1+ →** culture neg. (extra 2 wks incub)
- **1-16-15: smear neg. → direct PCR = Inconclusive**

Treatment Situation

- October 15 – December 31, 2014
- Finished 2 months of treatment - multiple breaks
- Nurse from PH “A” got letter from TB Dr. at PH “B” that MDDR result said “not TB” – stopped drugs
- Stopped due to severe, persistent itching with lack of + TB culture
 - Cause never determined
 - Grandson had scabies
 - Her skin lesions consistent with scabies or bedbugs but no parasites were found

January 2015

Patient Going Back to Cambodia

- Extensive Discussion
 - County PH “A” and “B” and MDH
 - Lab – **“PCR result will not help decision”**
 - Decision about what to do – more urgent
 - patient’s “strong wish to keep her airplane ticket to Cambodia”
 - intention of not returning to U.S. or Minnesota

January 2015

- **Jan-16-2015:**
 - smear negative
 - Direct MTBC PCR = **inconclusive**
 - *Culture negative (finalized – Feb 2015)*
- Repeat chest X-ray
 - Bi-apical scarring...consistent with old tuberculosis
 - No acute infiltrates or significant change compared to previous

January 2015

- MN - TB Medical Consultant – ID Doc Assessment and Recommendation
 - No current evidence of re-activation of pulmonary TB
 - Should be safe to travel – flew out Jan. 21st
 - Awaited culture results to inform patient

Lab “Behind the Scenes”

- **Specimen 10-11-14:** Smear 1+; Culture = *M. fortuitum*
 - Original direct:
 - MTBC PCR + (32 Ct)
 - Sent to CDC 2nd – MDDR = no MTBC amplification
 - Repeat original direct: MTBC PCR + (32 Ct)
 - Re-extract original direct: MTBC PCR + (32 Ct)
 - MGIT broth:
 - Line Probe = *M. fortuitum*
 - Growth from plate
 - Rapid-grower, creamy, covered entire plate
 - MTBC PCR = positive (35 Ct)
 - DNA probe for MTB = negative
 - Sent to CDC 1st MDDR = no MTBC amplification

October 2014 – Lab “Behind the Scenes”

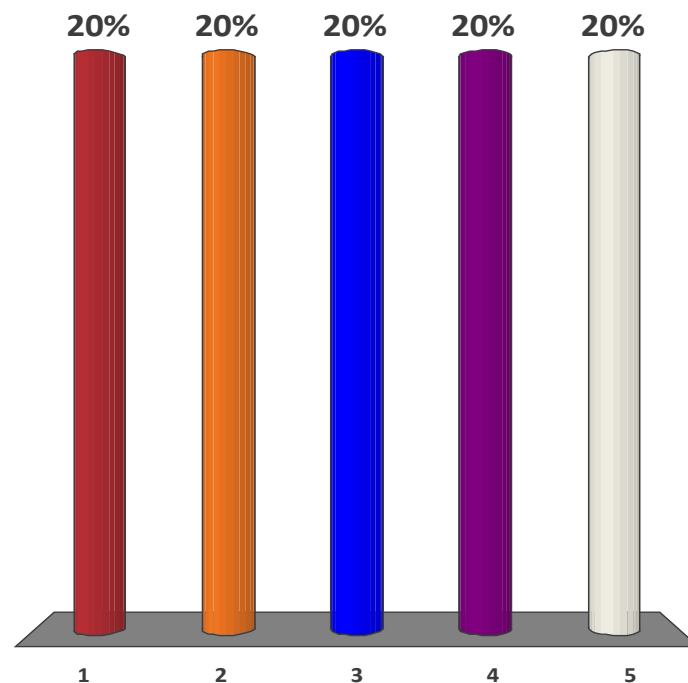
- **Specimen collected 10-12-2014:**
 - Smear 1+ positive
 - Original direct **MTBC PCR +** (33 Ct)
 - Culture = no growth (incub. extra 2 weeks)



Lab Results – What would you do?

Q1: What would your lab do as a next step when Smear +; PCR +; Culture negative at end of normal incubation?

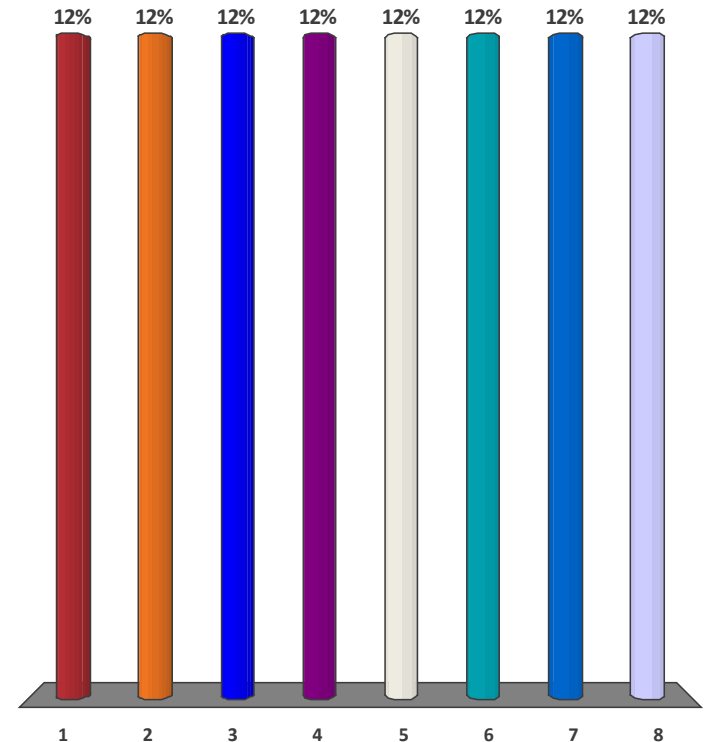
1. Hold culture extra 2 weeks – call negative if no growth
2. Go back to original sample and start over
3. Nothing
4. 1 and 2 above
5. Other



Lab Results – What would you do?

Q2: What would your lab do as a next step when Smear +; MTBC PCR +; Culture = *M. fortuitum*?

1. Redigest the MGIT and re-set up
2. Hold culture extra 2 weeks
3. Go back to original sample and start over
4. Run PCR on the MGIT
5. Dilute MGIT and set up solid media for TB isolation
6. Nothing
7. Multiple above
8. Other



Thank you!

- Nadya Sabuwala – MDH Nurse Consultant
- Trudy Kupferschmidt – MDH TB Lab
- Scott Fisher – MDH TB Lab
- Kerry MacInnes – MDH TB Lab
- Jason Wotton – MDH Molecular Epi Lab
- Gongping Liu – MDH Molecular Epi Lab