Case of month : NTM infection

Dr. Vipul V Shah

MD

Consultant : Infectious diseases

Case history

- 28 years old female
- History of LSCS on 08-03-2015
- Stitch removed on 10^{th} day
- Discharge from stitch site after one month
- Repeated dressing done
- Various antibiotics received

Case history

- No history of fever, loss of appetite or loss of weight
- No other systemic symptoms
- No history of pain or redness at local site
- General examination is normal except pallor
- Systemic examination normal
- Two sinus opening on stitch line
- Watery discharge present

Microbiology on 03-06-2015

- Discharge/pus smear positive for AFB +
- Negative for pyogenic culture
- Negative for fungal culture

SYNERGY
Micropath Laboratory
Ensuring Quality Health Service

Dr. Pradeep Nawal
M.D. Microbiology

Dr. Amit Prajapati
M.B., D.C.P. (Patho)

LABORATORY REPORT

Name	: [redacted]	Registration on	: 03-Jun-2015 21:16
Lab ID	: 1506100037 Pat ID 1506100037	Collected on	: 03-Jun-2015 21:15
Sex/Age	: F / 28 Years	Approved on	: 05-Jun-2015 20:17
Ref. By	:	Sample Type	: PUS
Location	: Shradhdha Multispeciality Hospital @ Khanpur		

TEST	RESULTS
PYOGENIC CULTURE AND SUSCEPTIBILITY FOR BACTERIA	
ecimen	Pus from Post LSCS Wound
am Stain	Many pus cells, no organisms seen.
hl-Neelsen Stain	Acid fast bacilli detected (+)
H Examination	Negative for fungal elements.
lture Result	Negative
ganism	Not Applicable
lony Count	Not Applicable
mments	Adv: (1) AFB Cuture and Susceptibility; (2) GeneXpert TB Sensitivity reporting has not been done as there was no growth of any bacteria after two days of aerobic incubation.

AFB culture

- Positive on 11-06-2016
- Positive after 6 day
- Turned to be Non Tuberculous Mycobacteria (NTM) also known as Mycobacterium Other Than Tuberculosis (MOTT)

SYNERGY
Micropath Laboratory
Ensuring Quality Health Service

Dr. Pradeep Nawal
M.D. Microbiology

Dr. Amit Prajapati
M.B., D.C.P. (Patho)

LABORATORY REPORT

ame	[redacted]D			Registration on	: 04-Jun-2015 12:42
b ID	: 1506100045	Pat ID	1506100037	Collected on	: 04-Jun-2015 12:41
x/Age	: F / 28 Years			Approved on	: 11-Jun-2015 11:47
f. By	: Dr Viral Shah - MS			Sample Type	: PUS
cation	: Shradhdha Multispeciality Hospital @ Khanpur 25600018				

TEST	RESULTS

ACID-FAST-BACILLI(AFB) CULTURE AND IDENTIFICATION

ecimen	Pus from Post LSCS Wound
hl-Neelsen Stain	Acid fast bacilli detected (+)
B Culture Primary Report	Not Applicable
B Culture Intermediate Report	Not Applicable
B Culture Final Report	Positive for AFB culture after 06 days of incubation.
anism	Mycobacterium other than tuberculosis complex (MOTT/NTM)
e	The specimen was processed by high throughput fully automated continuous monitoring instrument BD BACTEC MGIT(Mycobacteria Growtth Indicator Tube) system which provides early detection of mycobacterial (AFB) growth in liquid culture and susceptibility of MTB to First line and Second line antitubercular drugs. It works on advance flourscence technology for giving rapid and accurate reports. In case of Positive result; Identification of Mycobacteria is done by rapid immunochromatography assay targeting TB antigen-MPT 64.

Line Probe Assay (LPA)

- LPA done for speciation of MOTT/NTM
- Found to be *M. Fortuitum*
- Drug Sensitivity Test (DST) done

SYNERGY
Micropath Laboratory
Ensuring Quality Health Service

Dr. Pradeep Nawal
M.D. Microbiology

Dr. Amit Prajapati
M.B., D.C.P. (Patho)

LABORATORY REPORT

Name	: R [redacted] D				
Lab ID	: **1506100347**	Pat ID	1506100037	Registration on	: 15-Jun-2015 19:31
Sex/Age	: **F / 28 Years**			Collected on	: 15-Jun-2015 19:31
Ref. By	: Dr Viral Shah - MS			Approved on	: 19-Jun-2015 18:41
Location	: Shradhdha Multispeciality Hospital @ Khanpur 25600018			Sample Type	: ANY SPECIMEN

TEST	RESULTS

Speciation of Common Mycobacteria by Line Probe Assay

Specimen	**Mycobacterial growth (Pus from Post LSCS Wound)**
Result of Line Probe Assay	**Mycobacterium fortuitum** ✓
Methodology of Line Probe Assay	**The GenoType LPANTMCM test is based on DNA Strip technology. The test consists of three steps: DNA extraction from cultured material (solid/liquid medium); a multiplex PCR amplification; reverse hybridization where single-stranded amplicons bind to specific probes attached to the LPA strips. The visualised band patterns on the strips are then interpreted by either a manual comparison with a printed template or read and analysed in the GenoScan reader.**

SYNERGY
Micropath Laboratory
Ensuring Quality Health Service

Dr. Pradeep Nawal
M.D. Microbiology

Dr. Amit Prajapati
M.B., D.C.P. (Patho)

LABORATORY REPORT

N [redacted]

Lab ID : 1506100347 Pat ID 1506100037
Sex/Age : F / 28 Years
Ref. By : Dr Viral Shah - MS
Location : Shradhdha Multispeciality Hospital @ Khanpur 25600018

Registration on : 15-Jun-2015 19:31
Collected on : 15-Jun-2015 19:31
Approved on : 19-Jun-2015 18:44
Sample Type : ANY SPECIMEN

NTM/MOTT DRUG SUSCEPTIBILITY REPORT

TEST	RESULTS	UNIT	BIOLOGICAL REFERENCE RANGE
Specimen	Mycobacterial growth (Pus from Post LSCS Wound)		
Ziehl-Neelsen Stain	Acid fast bacilli detected (+)		
Organism	Mycobacterium fortuitum		
Trimethoprim / Sulphamethaxole (0.25/4.75 - 8/152)	Resistant (4/76)	microgm/ml	
Linezolid (1 - 32)	Sensitive (4)	microgm/ml	
Ciprofloxacin (0.12 - 4)	Sensitive (1)	microgm/ml	
Imipenem (2 - 64)	Sensitive (4)	microgm/ml	
Moxifloxacin (0.25 - 8)	Sensitive (0.25)	microgm/ml	
Cefepime (1-32)	Resistant (32)	microgm/ml	
Cefoxitin (4 -128)	Sensitive (8)	microgm/ml	
Amoxicillin / clavulanic acid (2/1 - 64/32)	Resistant (64/32)	microgm/ml	
Amikacin (1-64)	Sensitive (1)	microgm/ml	
Ceftriaxone (4 - 64)	Resistant (64)	microgm/ml	
Doxycycline (0.12-16)	Sensitive (0.5)	microgm/ml	
Minocycline (1 - 8)	Sensitive (<1)	microgm/ml	
Tigecycline (0.015 - 4)	Sensitive (0.5)	microgm/ml	
Tobramycin (1 - 16)	Intermediate (4)	microgm/ml	
Clarithromycin (0.06 - 16)	Sensitive (0.12)	microgm/ml	
Comments	Tobramycin should not be used to treat infections with the Mycobacterium fortuitum group.		

Treatment

- Patient put on treatment
- Inj Amikacin 1 gm (500 mg + 500 mg) IV
- Tab Clarithromycin 500 mg BID
- Tab Ethambutol 800 mg OD
- Discharge stopped after one month
- Repeat USG satisfactory

Follow up

- Creatinine was monitored
- Amikacin stopped after two months
- Clarithromycin and ethambutol continued
- After total of 5 month of therapy USG was done
- Complete obliteration of sinus tracts
- Stopped treatment at 9 months

Introduction : NTM

- Non tubercular mycobacterial infection (NTM) does exist in India but does not look as a common problem to most of internist.
- High degree of suspicion is required to think & diagnose NTM infection.
- Causes a range of disease in both immunocompetent and immunocompromised patients and may affect different organs.
- The role of laboratory is very vital to identify, speciate and differentiate from MTB by culture & molecular method.
- Treatment is totally different of NTM from MTB.

Runyon Classification of NTM

SG- NTM (SGM) (> 7 days)	**Photochromogens** (Runyon group I) • *M. kansasii* • *M. marinum* • *M. simiae*	**Scotochromogens** (Runyon group II) • *M. scrofulaceum* • *M. gordonae* • *M.szulgai*	**Nonchromogens** (Runyon group III) • MAC • *M. xenopi* • *M. ulcerans* • *M. terrae* • *M haemophilum*
RG- NTM (RGM) (Runyon group IV) (< 7 days)	*M. fortuitum , M. chelonae, M. abscessus, , M. smegmatis*		

J lab Clin Med 1954 ; (44) 202 - 209

Clinical Classification of NTM diseases.

Immunocompromised Status	Immunocompetent Status
Disseminated disease with multisystem involvement, with MAC, *kansasii* and similar organisms	(1) **Inhalation / Ingestion**
	· Chronic pulmonary disease
	· Lymphadenitis
	(2) **Post Inoculation NTM**
	· Surgical inoculation
	· Post injection abscess
	· Swimming pool granuloma
	· Buruli ulcer
	(3) Intravascular stent / cardiac procedure related blood stream infection

Treatment of NTM infection

- No empirical therapy is recommended
- Confirm the diagnosis, rule out contamination – pulmonary NTM
- Duration: pulmonary & disseminated : 12 months post negative cultures.
- For skin & soft tissue, bone & joint & lymphadenitis 4 – 6 months.
- Surgical debridement : once or repeated should be considered from risk / benefit perspective
- As there are no randomized control trials done in recent past, treatment recommendation is given as per guideline of ATS / IDSA of 2007.

Am J Resp Crit Care Med. 2007; 175 : 376 - 416

Treatment of Infection

- MAC : Clarithromycin / Azithromycin, Ethambutol, Rifampicin
- *M. Kansasii* : Rifampicin, isoniazid, Ethambutol, Streptomycin & Clarithromycin – Usually preferred three drug regimen (HER)
- *M. Fortuitum* : Amikacin, Clarithromycin, Linezolid, Ciprofloxacin, Imipenem, TMP/SMX, Tigecycline, Cefoxitin, Doxycycline.
- *M. Absceus* : Amikacin, Clarithromycin, Tigecycline, Cefoxitin, Imipenem Linezolid, Doxycycline, Ciprofloxacin.
- *M. Chelonae* : Tobramycin / Amikacin, Clarithromycin, Imipenem, Tigecycline Linezolid, Doxycycline, Ciprofloxacin.

Am J Resp Crit Care Med. 2007; 175 : 376 - 416

Thanks and Acknowledgement

- Patient
- Dr. Viral Shah for referring patient
- Dr. Khyati Makwana, clinical assistant – HIDC
- Synergy micropath lab