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Article

Cyto-histopathological correlation in Hansen's disease. A case series

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Abstract

Introduction: Hansen's Disease is a chronic infectious disease caused by Mycobacterium leprae. It primarily affects peripheral nerves and skin. Hansen's disease can be diagnosed on the basis of skin lesions and peripheral nerves along with cytological and histopathological examination by demonstration of acid-fast bacilli.(1) *Objectives:* Concordance between clinical, cytological and histopathological diagnosis in cases of leprosy using Ridley–Jopling scale. *Material and methods:* The present prospective study was conducted in the Department of Dermatology Venerology and Leprosy in collaboration with Department of Pathology and Microbiology in Index Medical College Hospital and Research Centre Indore Madhya Pradesh, India. Ten patients clinically diagnosed as cases of leprosy were included in this study. Slit Skin smears and biopsies of all these cases of Hansen's disease were done and the cases were classified according to Ridley–Jopling classification into TT, BT, BB, I, BL, and LL. Cytological and histopathological correlation was done for all the cases. *Results :* Observation from this study revealed commonest age group affected by Hansen' s Disease was 41-50 Years of age. Males are affected predominantly and the commonest clinically diagnosed spectrum was LL (Lepromatous leprosy). It was observed that there was concordance between clinical diagnosis, cytological and histopathological diagnosis. *Conclusion:* For accurate

diagnosis correlation of clinical, cytological and histopathological features appears to be more reliable than considering any of the parameters alone.(2)

Keywords: Hansen's disease**,** cytological and histopathological diagnosis, Ridley–Jopling scale, Leprosy

Introduction

Hansen's disease is a chronic infectious and granulomatous disease caused by Mycobacterium Leprae . Hansen's disease is a gradually progressive disease with long incubation period and primarily affects skin and peripheral nerves. The disease is classified according to Ridley Jopling classification and Indian classification

Ridley Jopling classification proposed a histological classification for leprosy as tuberculoid (TT) , borderline tuberculoid (BT) , mid borderline (BB) , borderline lepromatous (BL) , and lepromatous leprosy (LL) , two important types missed in Ridley Jopling includes indeterminate and pure neuritic type included in Indian classification WHO classified it into Paucibacillary and multibacillary type (3)

Hansen's disease is diagnosed based on different parameters which involves examination of skin lesions, peripheral nerves , along with histopathological and cytological examination. That is clinical diagnosis combined with histopathological and microbiological diagnosis.

The study is being carried out to diagnose cases based on above three criteria (5).

Materials and methods

The present prospective study was conducted in the Departments of Dermatology venerology and leprosy , microbiology and pathology Index medical college hospital and research center Indore .ten clinically diagnosed cases of leprosy were included in this study. Slit Skin smears and biopsies of all suspected cases of Hansen's disease received over a period of 1.5 year(October 2020- January 2021). Hematoxylin and eosin and ZN stained sections of all cases were analyzed and the cases were classified according to Ridley–Jopling classification into TT, BT, BB, I, BL, and LL. cytohistological correlation was done for all the cases

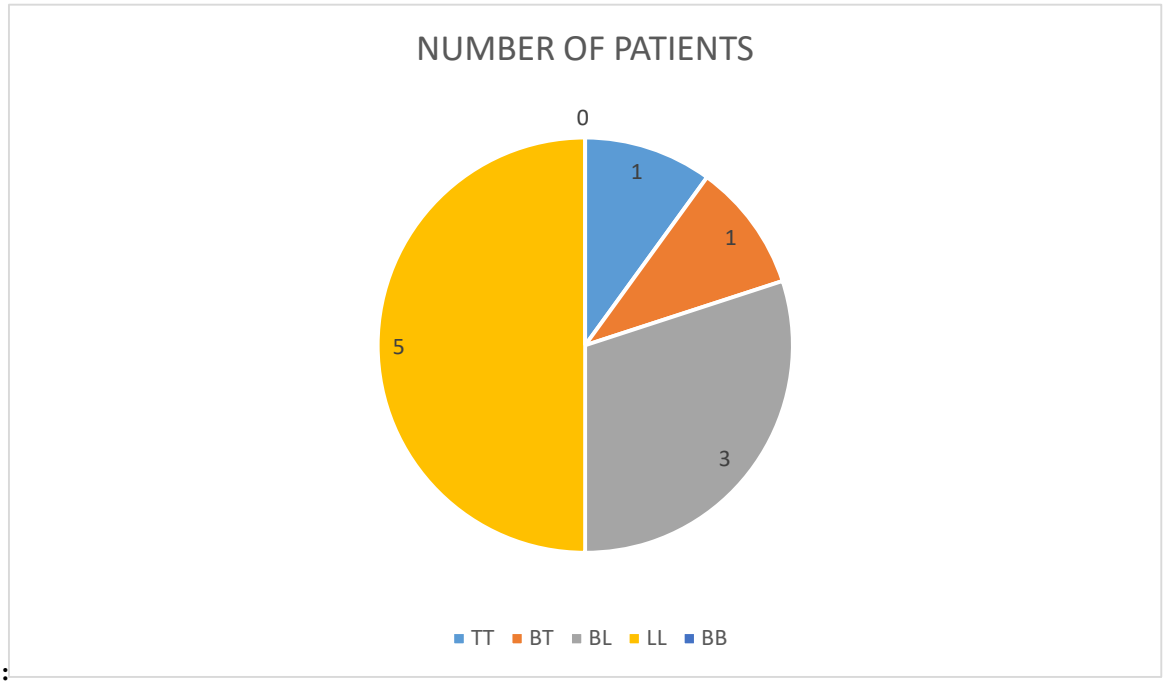
Statistical analysis (1)

Comparing the cytological and histopathological diagnosis with clinical diagnosis (2) evaluating the relationship and correlation between the three parameters

AGE	TT	BT	BB	BL	LL
1-10 YR	0	0	0	0	0
11-20 YR	0	0	0	0	0
21-30 YR	0	0	0	0	0
31-40 YR	0	1	0	1	2
41-50YR	1	0	0	1	2
51-60YR	0	0	0	0	1
60-70 yr	0	0	0	1	0

CYTOHISTOLOGICAL CORRELATION:

CYTOLOGICAL DIAGNOSIS	NO. OF CASES
TT	1
BT	1
BB	0
BL	3
LL	5



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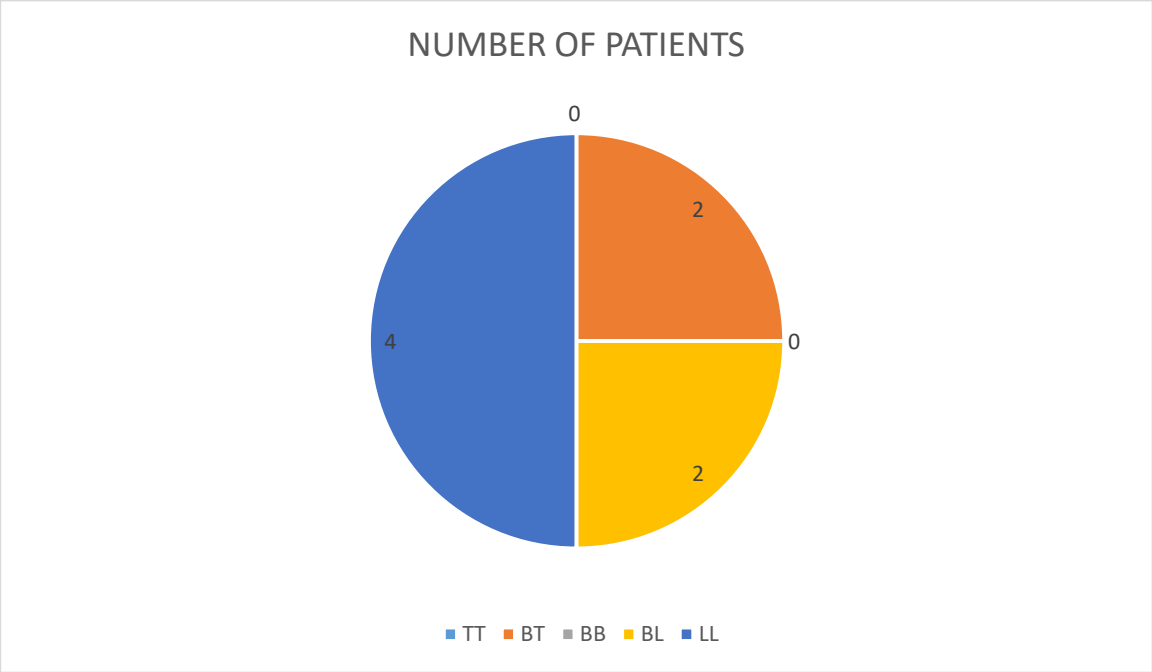
HISTOPATHOLOGICAL CORRELATION

HISTOPATHLOGICAL CORRELATION	NO OF CASES
TT	0
BT	2
BB	0
BL	2
LL	4



CYTOHISTOLOGICAL CORRELATION WAS FOUND IN 85 % OF THE CASES

Observations

A total of 10 cases were included in the study with the clinical diagnosis of Hansen's disease, over a period of 1 year . After clinical assessment all these patients all these patients were subjected to cytological examination followed by histopathological examination

Discussion

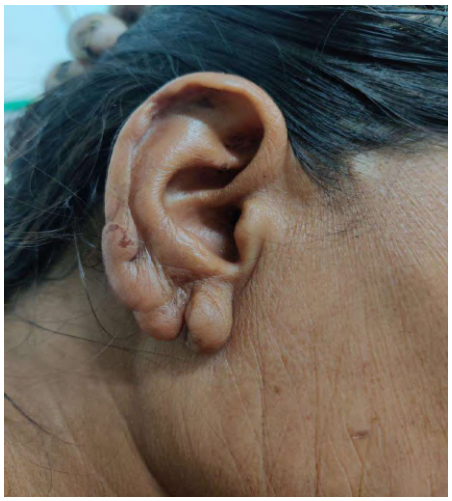
Leprosy is a slowly progressive infection caused by Mycobacterium leprae affecting the skin and peripheral nerves. Histopathological examination of skin lesion is the gold standard for accurate diagnosis. During the period of 1.5 year biopsies of 10 patients were analyzed in this study.
Leprosy can occur at all ages.
In the present study, patients of 41-50 years were affected most and patients below 7 years were affected least.(7)

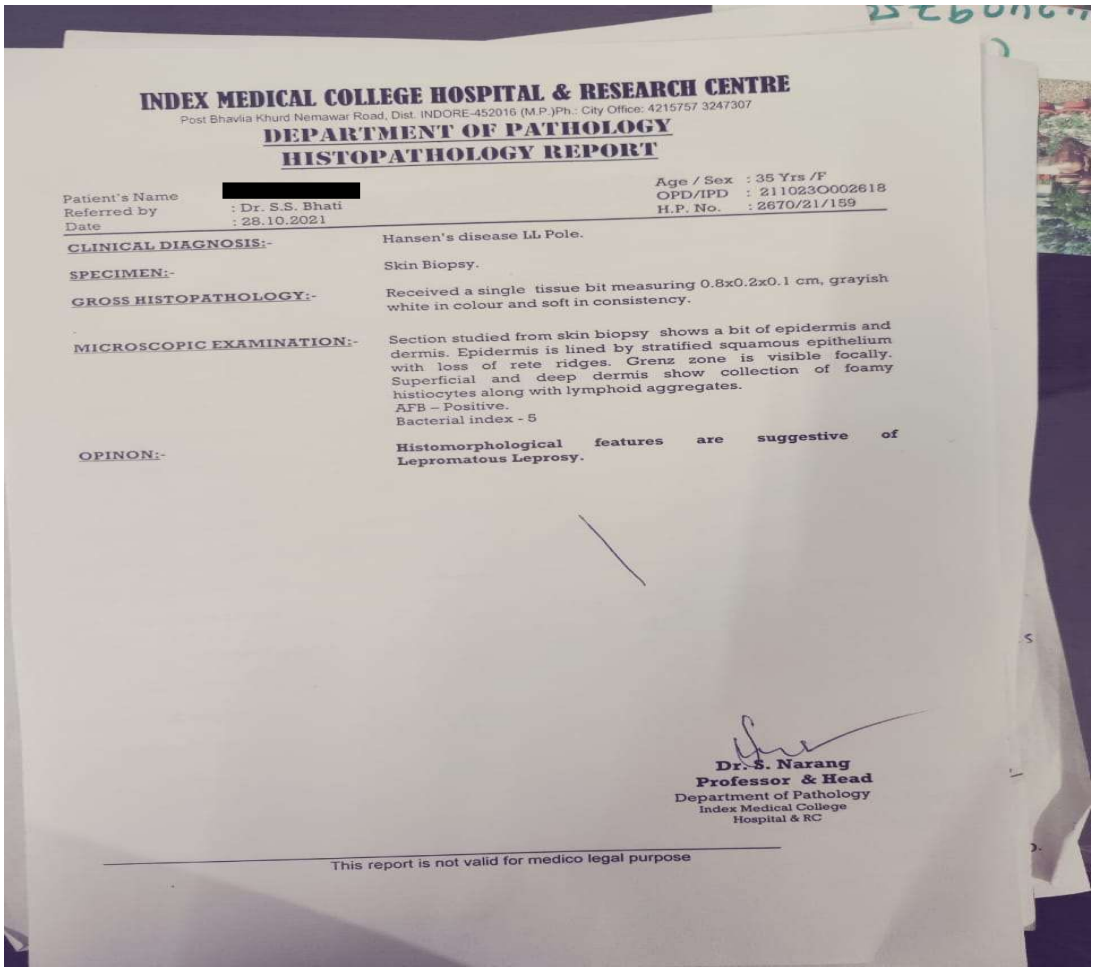
Conclusion

Correlation of clinical, cytological, and histopathological features is done and all the three parameters are compared , from the study it is concluded that all the three parameters are required to get full picture of the disease(8)

Below are the clinical images showing correlation between clinically diagnosed cases and cytological and histopathological correlation

CASE 1: A 35 YEAR OLD FEMALE PRESENTS WITH COMPLAINS OF LOSS OF EYEBROWS , LOSS OF SENSATIONS OVER BILATERAL PALMS AND SOLES SINCE 5 YEARS WITH NO HOT AND COLD SENSATIONS PERCEPTION , CLINICALLY SUSPECTED AS LEPROMATOUS LEPROSY FURTHER BIOPSY AND SPLIT SKIN SMEARS CONFIRMS THE CLINICAL DIAGNOSIS





INDEX MEDICAL COLLEGE HOSPITAL & RESEARCH CENTRE

Post Bhavlia Khurd Nemawar Road, Dist. INDORE-452016 (M.P.)Ph.: City Office: 4215757 3247307

DEPARTMENT OF PATHOLOGY

HISTOPATHOLOGY REPORT

Patient's Name [redacted] Age / Sex : 35 Yrs /F

Referred by : Dr. S.S. Bhati OPD/IPD : 211023O002618

Date : 28.10.2021 H.P. No. : 2670/21/159

CLINICAL DIAGNOSIS:- Hansen's disease LL Pole.

SPECIMEN:- Skin Biopsy.

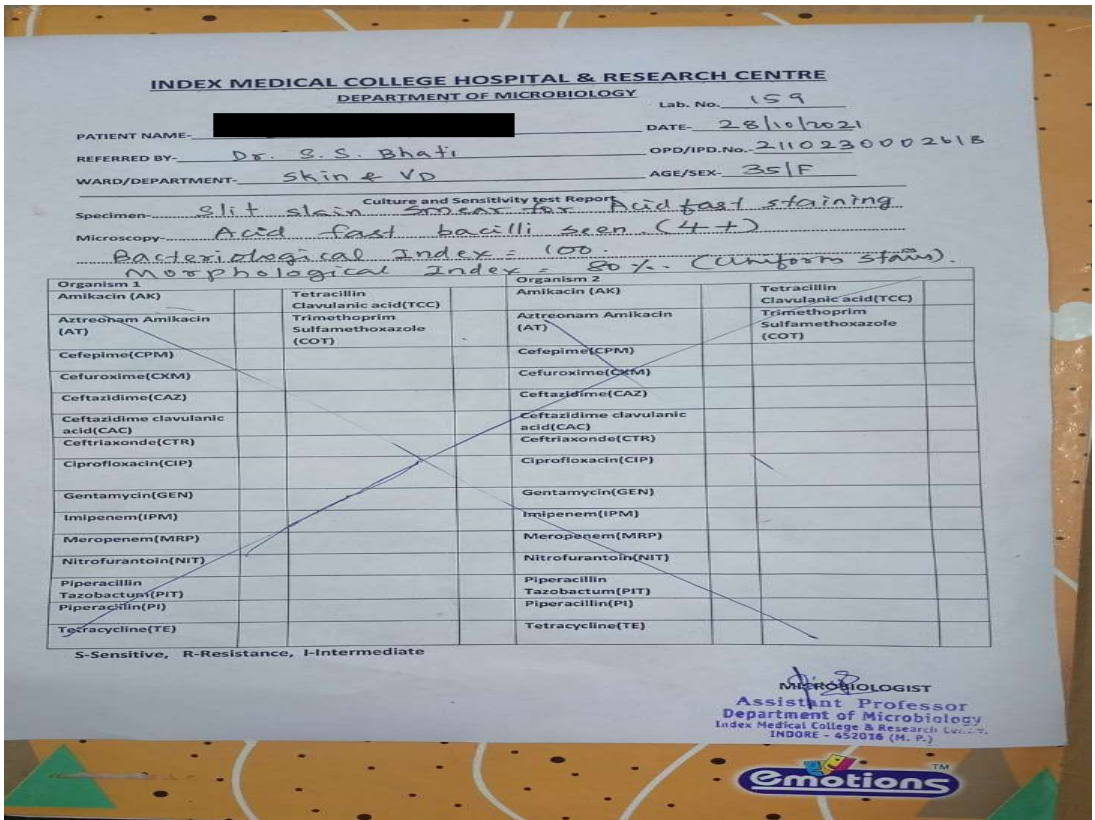
GROSS HISTOPATHOLOGY:- Received a single tissue bit measuring 0.8x0.2x0.1 cm, grayish white in colour and soft in consistency.

MICROSCOPIC EXAMINATION:- Section studied from skin biopsy shows a bit of epidermis and dermis. Epidermis is lined by stratified squamous epithelium with loss of rete ridges. Grenz zone is visible focally. Superficial and deep dermis show collection of foamy histiocytes along with lymphoid aggregates.
AFB – Positive.
Bacterial index - 5

OPINON:- **Histomorphological features are suggestive of Lepromatous Leprosy.**

Dr. S. Narang
Professor & Head
Department of Pathology
Index Medical College
Hospital & RC

This report is not valid for medico legal purpose



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DEPARTMENT OF MICROBIOLOGY

Lab. No. 159

PATIENT NAME- [redacted] DATE- 28/10/2021

REFERRED BY- Dr. S. S. Bhati OPD/IPD.No. 211023000002618

WARD/DEPARTMENT- Skin & VD AGE/SEX- 35/F

Culture and Sensitivity test Report

Specimen- slit skin smear (s) Acid fast staining

Microscopy- Acid fast bacilli seen. (4+)

Bacteriological Index = 100.

Morphological Index = 80 %. (Uniform stain).

Organism 1			Organism 2		
Amikacin (AK)		Tetracillin Clavulanic acid(TCC)	Amikacin (AK)		Tetracillin Clavulanic acid(TCC)
Aztreonam Amikacin (AT)		Trimethoprim Sulfamethoxazole (COT)	Aztreonam Amikacin (AT)		Trimethoprim Sulfamethoxazole (COT)
Cefepime(CPM)			Cefepime(CPM)		
Cefuroxime(CXM)			Cefuroxime(CXM)		
Ceftazidime(CAZ)			Ceftazidime(CAZ)		
Ceftazidime clavulanic acid(CAC)			Ceftazidime clavulanic acid(CAC)		
Ceftriaxonde(CTR)			Ceftriaxonde(CTR)		
Ciprofloxacin(CIP)			Ciprofloxacin(CIP)		
Gentamycin(GEN)			Gentamycin(GEN)		
Imipenem(IPM)			Imipenem(IPM)		
Meropenem(MRP)			Meropenem(MRP)		
Nitrofurantoin(NIT)			Nitrofurantoin(NIT)		
Piperacillin Tazobactum(PIT)			Piperacillin Tazobactum(PIT)		
Piperacillin(PI)			Piperacillin(PI)		
Tetracycline(TE)			Tetracycline(TE)		

S-Sensitive, R-Resistance, I-Intermediate

MICROBIOLOGIST
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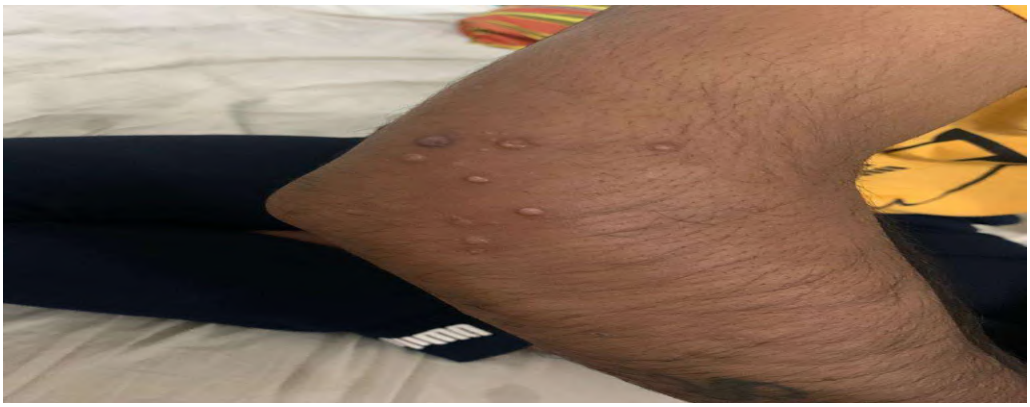
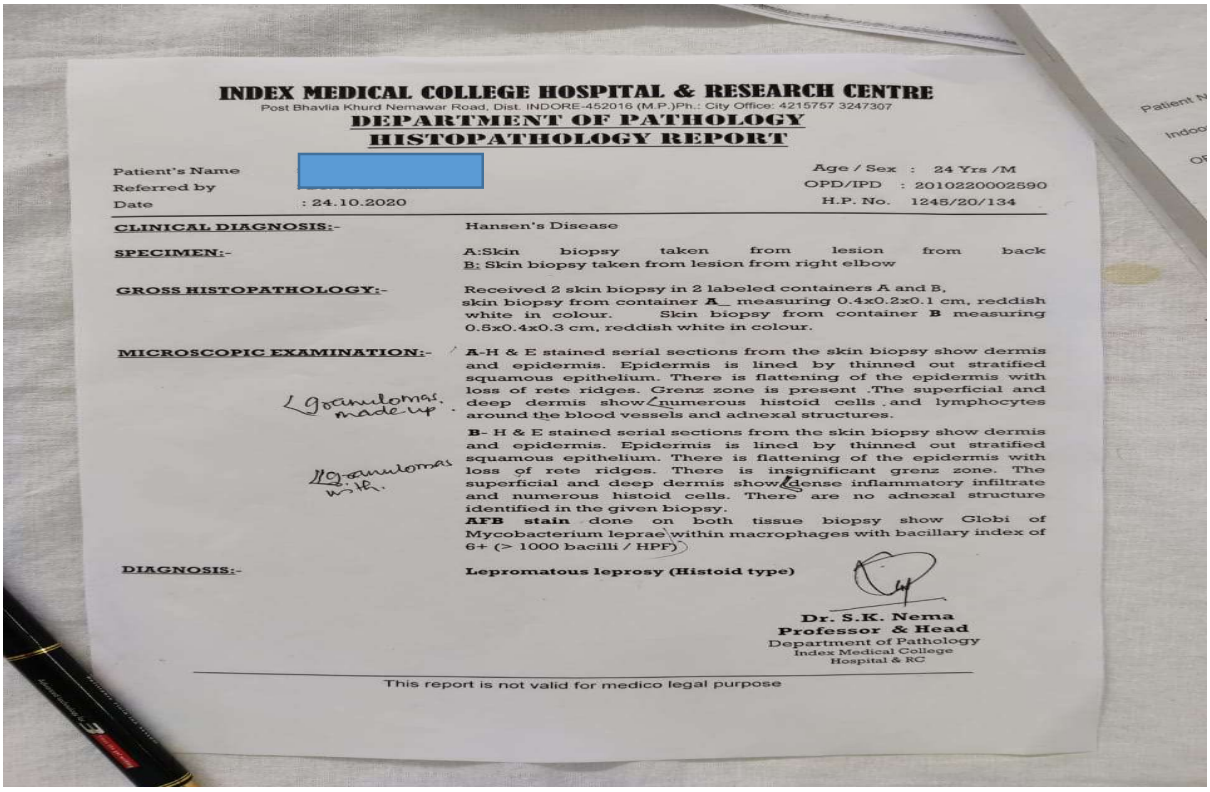
CASE 2 : A 24 YEAR OLD MALE PRESENTED WITH NUMBNESS OVER BILATERAL UPPER LIMBS AND LOWER LIMBS SINCE 2 YEARS WITH MULTIPLE NODULAR LESIONS ALL OVER THE BODY SINCE 25 DAYS ASSOCIATED WITH FEVER AND PAIN OVER UPPER LIMBS SINCE LAST 20 DAYS





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Post Bhavlia Khurd Nemawar Road, Dist. INDORE-452016 (M.P.)Ph.: City Office: 4215757 3247307
DEPARTMENT OF PATHOLOGY
HISTOPATHOLOGY REPORT

Patient's Name [redacted] Age / Sex : 24 Yrs /M
Referred by OPD/IPD : 2010220002590
Date : 24.10.2020 H.P. No. 1245/20/134

CLINICAL DIAGNOSIS:- Hansen's Disease

SPECIMEN:- A:Skin biopsy taken from lesion from back
B: Skin biopsy taken from lesion from right elbow

GROSS HISTOPATHOLOGY:- Received 2 skin biopsy in 2 labeled containers A and B, skin biopsy from container **A** measuring 0.4x0.2x0.1 cm, reddish white in colour. Skin biopsy from container **B** measuring 0.5x0.4x0.3 cm, reddish white in colour.

MICROSCOPIC EXAMINATION:- **A**-H & E stained serial sections from the skin biopsy show dermis and epidermis. Epidermis is lined by thinned out stratified squamous epithelium. There is flattening of the epidermis with loss of rete ridges. Grenz zone is present .The superficial and deep dermis show numerous histoid cells and lymphocytes around the blood vessels and adnexal structures.

B- H & E stained serial sections from the skin biopsy show dermis and epidermis. Epidermis is lined by thinned out stratified squamous epithelium. There is flattening of the epidermis with loss of rete ridges. There is insignificant grenz zone. The superficial and deep dermis show dense inflammatory infiltrate and numerous histoid cells. There are no adnexal structure identified in the given biopsy.
AFB stain done on both tissue biopsy show Globi of Mycobacterium leprae within macrophages with bacillary index of 6+ (> 1000 bacilli / HPF)

DIAGNOSIS:- **Lepromatous leprosy (Histoid type)**

Dr. S.K. Nema
Professor & Head
Department of Pathology
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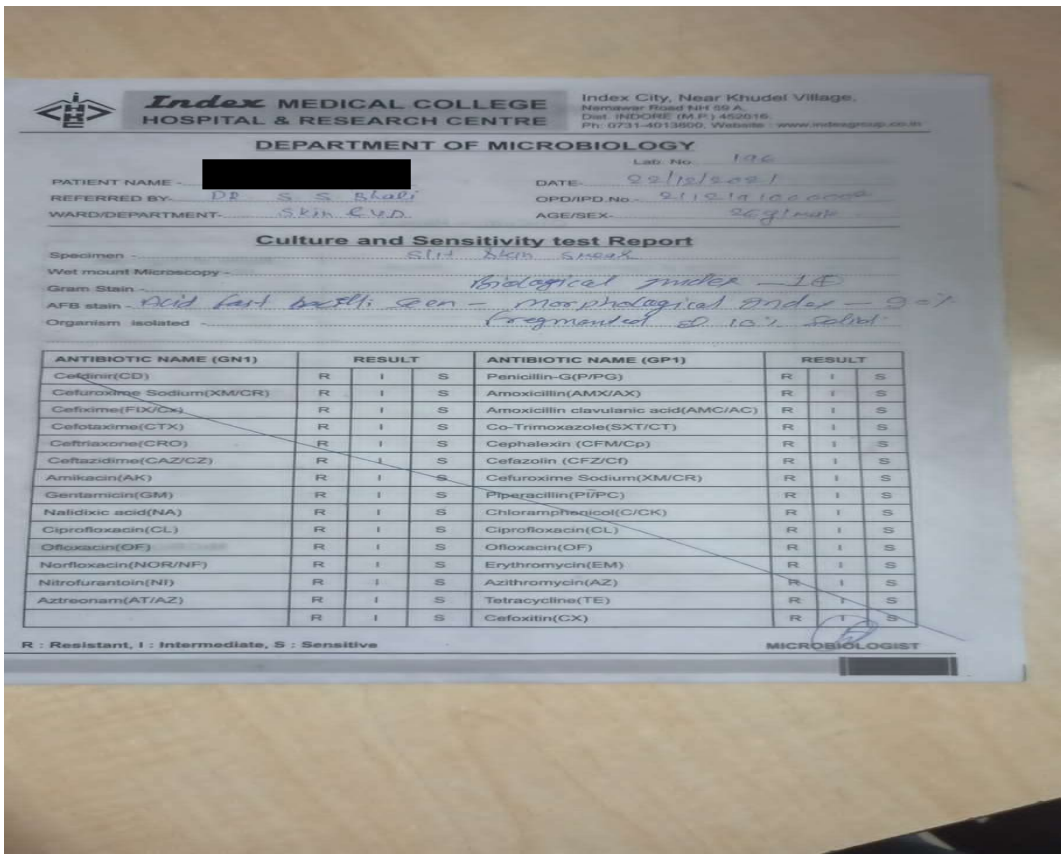
Hospital & RC

This report is not valid for medico legal purpose



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Ph: 0731-4013800, Website : www.indexgroup.co.in

DEPARTMENT OF MICROBIOLOGY

Lab. No. 196
PATIENT NAME - [redacted] DATE- 29/10/2020
REFERRED BY- Dr S S Rikad OPD/IPD No- 2110191000000
WARD/DEPARTMENT- Skin C.D. AGE/SEX- 24/M

Culture and Sensitivity test Report

Specimen - Skin Biopsy Smear
Wet mount Microscopy -
Gram Stain - Histological smear — If
AFB stain - Acid fast bacilli seen — Morphological index — 3+
Organism isolated - Fragmented 2D 10% Solid

ANTIBIOTIC NAME (GN1)	RESULT			ANTIBIOTIC NAME (GP1)	RESULT		
Cefdinir(CD)	R	I	S	Penicillin-G(P/PG)	R	I	S
Cefuroxime Sodium(XM/CR)	R	I	S	Amoxicillin(AMX/AX)	R	I	S
Cefixime(FIX/Cx)	R	I	S	Amoxicillin clavulanic acid(AMC/AC)	R	I	S
Cefotaxime(CTX)	R	I	S	Co-Trimoxazole(SXT/CT)	R	I	S
Ceftriaxone(CRO)	R	I	S	Cephalexin (CFM/Cp)	R	I	S
Ceftazidime(CAZ/CZ)	R	I	S	Cefazolin (CFZ/Cf)	R	I	S
Amikacin(AK)	R	I	S	Cefuroxime Sodium(XM/CR)	R	I	S
Gentamicin(GM)	R	I	S	Piperacillin(PI/PC)	R	I	S
Nalidixic acid(NA)	R	I	S	Chloramphenicol(C/CK)	R	I	S
Ciprofloxacin(CL)	R	I	S	Ciprofloxacin(CL)	R	I	S
Ofloxacin(OF)	R	I	S	Ofloxacin(OF)	R	I	S
Norfloxacin(NOR/NF)	R	I	S	Erythromycin(EM)	R	I	S
Nitrofurantoin(NI)	R	I	S	Azithromycin(AZ)	R	I	S
Aztreonam(AT/AZ)	R	I	S	Tetracycline(TE)	R	I	S
	R	I	S	Cefoxitin(CX)	R	I	S

R : Resistant, I : Intermediate, S : Sensitive

MICROBIOLOGIST

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