

INFECTIOUS DISEASES PRACTICAL

1. Lepromatous leprosy

1. Identify the slide ?

Ans – Lepromatous leprosy

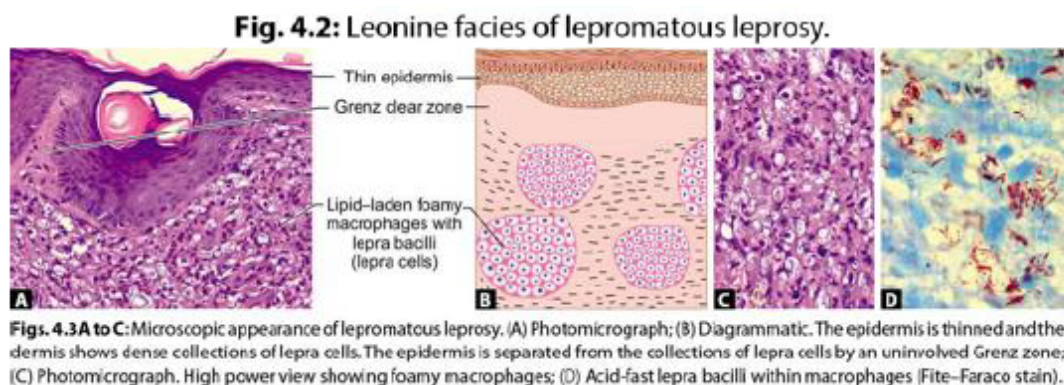
2. Enumerate 2 characteristic microscopic features ?

Ans : ***Microscopy of Skin Lesion***

a) Epidermis is thin with flattening of rete ridges.

b) Dermis contains large aggregates of foamy macrophages – *lepra cells*

c) **Grenz (clear) zone:** It is a characteristic, **narrow, uninvolved dermis** which separates the epidermis from the aggregates of foamy of macrophages.



3. How do you classify the disease ?

Classification of leprosy:
 1. Ridley and Jopling classification
 2. WHO classification

Ridley-Jopling classification	Tuberculoid leprosy (TT)	Borderline tuberculoid (BT)	Borderline (BB)	Borderline lepromatous (BL)	Lepromatous leprosy (LL)	F N O
Lepra bacilli on microscopy	Negative		Positive			
WHO category and treatment group	Paucibacillary patients		Multibacillary patients			

4) What is the special stain used for diagnosis ?

Ans. Fite faraco stain.

Rhinosporidiosis

1. Identify the slide ?

Ans : Rhinosporidiosis

2. Enumerate 2 characteristic microscopic features ?

Ans : Section of nasal mucosa , with many spherical cysts called as sporangia measuring up to 200 nm in diameter having thick-wall (chitinous wall) are seen.

Each of these cysts (i.e., sporangium) contain numerous small basophilic round spores of the size of erythrocytes.

- Chronic inflammatory (plasma cells, lymphocytes, histiocytes, neutrophils) infiltrate in

the intervening stroma .

3) Name the causative organism ?

Ans : Rhinosporidium seeberi

4) What are the common sites involved ?

Ans . Nasopharynx as polyp, larynx and conjunctiva

5) What is the gold standard test for diagnosis ?

Ans . Biopsy

SEMEN ANALYSIS

NORMAL PARAMETERS		
	WHO 2010	WHO 2021
Semen volume (mL)	1.5 (1.4–1.7)	1.4 (1.3–1.5)
Total sperm number (10^6 per ejaculate)	39 (33–46)	39 (35–40)
Total motility (%)	40 (38–42)	42 (40–43)
Progressive motility (%)	32 (31–34)	30 (29–31)
Non progressive motility (%)	1	1 (1–1)
Immotile sperm (%)	22	20 (19–20)
Vitality (%)	58 (55–63)	54 (50–56)
Normal forms (%)	4 (3–4)	4 (3.9–4)

INDICATIONS FOR SEMEN ANALYSIS

- Infertility
- To check the effectiveness of vasectomy by confirming absence of sperms
- To support or disprove a denial of paternity on the gonads of sterility

Diluting fluid used for semen analysis : Sodium Bicarbonate and formalin diluent

Normal values of semen analysis

- Volume: ≥ 1.5 ml
- Appearance: Whitish, opalescent
- Viscosity: Normal (liquefies within 60 min)
- Liquefaction: Within 60 min
- pH: 7.2-8.6
- Sperm concentration: ≥ 15 million/ml
- Morphology: $\geq 4\%$ normal forms (WHO 2021)
- Vitality: $\geq 54\%$ live
- White blood cells: < 1 million/ml
- Motility: $\geq 42\%$ total motile, $\geq 32\%$ progressive

TERMINOLOGY IN SEMEN ANALYSIS		
NORMOZOOSPERMIA	All semen parameters are normal.	
OLIGOZOOSPERMIA	Sperm concn. < 15 million per ml.	
AZOOSPERMIA	Absence of sperms in seminal fluid.	
ASPERMIA	Absence of ejaculate.	
ASTHENOZOOSPERMIA	Reduced sperm motility, percentage of progressively motile sperms below normal reference range.	
TERATOZOOSPERMIA	Spermatozoa with reduced proportion of normal morphology or increased abnormal forms.	
OLIGOASTHENOTERATOZOOSPERMIA	All variables are abnormal	
LEUKOCYTOSPERMIA	> 1 million WBC per ml of semen.	
NECROZOOSPERMIA	All sperm are non motile or non viable.	

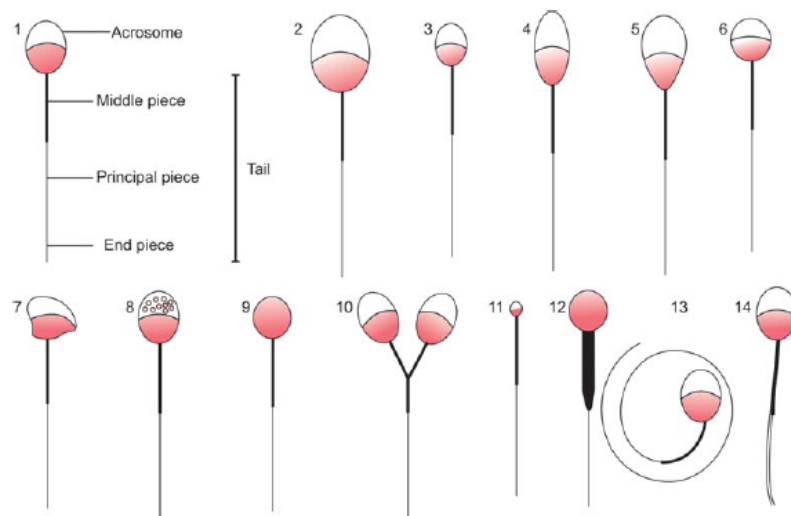


Fig. 15.3: Abnormal morphological sperm forms: (1) Normal sperm, (2) Large head, (3) Small head, (4) Tapered head, (5) Pyriform head, (6) Round head, (7) Amorphous head, (8) Vacuoles in head, (9) Round head without acrosome, (10) Double head, (11) Pin head, (12) Round head without acrosome and thick midpiece, (13) Coiled tail, and (14) Double tail

SEMEN ANALYSIS CHART 1

30 yr old male underwent semen analysis for work up of primary infertility

Volume	2ml
Colour	Whitish
Viscosity	Normal
Liquefaction Time	45 min
pH	7.6
Sperm concentration	12 million/ml
Total Motility	42%
Progressive motility	17%
Non Progressive Motility	25%
Immotile	58%
Mobile sperm count	5.04 millions/ml
Normal morphology	4%
Vitality	62%
Pus cells	1-2/hpf

1. Oligoasthenozoospermia/Oligoasthenospermia – Low sperm motility (astheno) and reduced sperm count .

2.What are the causes of the condition?

- Epididymal sperm maturation defect
- Ejaculatory duct obstruction
- Infections
- Cryptorchidism
- Varicocele

CHART 2

30 yr old male underwent semen analysis for work up of primary infertility

Volume	0.5ml
Colour	Whitish
Viscosity	Normal
Liquefaction Time	45 min
pH	6.8
Sperm concentration	1.2 million/ml
Total Motility	30%
Progressive motility	16%
Non Progressive Motility	14%
Immotile	70%
Mobile sperm count	2.4millions/ml
Normal morphology	3%
Vitality	62%
Pus cells	1-2/hpf

1.What is your diagnosis ?

Ans - Severe oligoasthenoteratozoospermia

Low volume (0.5ml)

Very low sperm count and poor motility

Abnormal morphology (3 % normal)

2. What are the causes of condition ?

Ans .

Pretesticular causes

- Deficient gonadotropin secretion by pituitary

Testicular causes

- Undescended testis
- Maldeveloped testis eg Klinefelter's syndrome
- Severe testicular damage eg mumps, radiation

Post-testicular causes

- Ductal obstruction at any level eg ejaculatory duct

Bone marrow aspiration needle

1) Identify the instrument ?

ans .Bone marrow aspiration needle

2) Name 4 INDICATIONS of the instrument

1) **Unexplained cytopenia**

2) **Suspected acute leukemia:**

3) **Suspected myelodysplastic syndrome.**

- 4) Suspected myeloproliferative disorders
- 5) Suspected plasma cell dyscrasia.
- 6) Suspected chronic lymphoid leukemias
- 7) Investigation of pyrexia of unknown origin: Detecting *Histoplasma capsulatum* and *Leishmania donovani* organisms .
- 8) Suspected storage disorder
- 9) Suspected infections like kala azar, miliary tuberculosis, or histoplasmosis.
 - Name 2 contraindications ?
 - 1) Hemophilia
 - 2) Coagulation disorders
- Dry tap – Failure to obtain marrow particles in aspiration ,even after proper technique.
seen in myelofibrosis, aplastic anemia and hairy cell leukemia .
- Advantages of bone marrow biopsy over bone marrow aspiration
 - 1) Better assessment of marrow architecture
 - 2) Accurate evaluation of cellularity
 - 3) Detects focal lesions missed on aspiration

Lumbar puncture needle

- 1) Identify the instrument ?

Ans . Lumbar puncture needle

2) Enumerate 4 Indications ?

- Diagnosis of CSF infections
- Diagnosis of subarachnoid haemorrhage
- Diagnosis of malignancy
- Therapeutic indications like intrathecal drug administrations
- CSF pressure relief

3) Enumerate 4 Contraindications ?

- Raised ICT with mass lesions
- Severe bleeding disorders
- Local infection at the site of lumbar puncture

4) Enumerate 2 Complications ?

- Postlumbar puncture headache
- Brain herniation
- Bleeding and infection

4) What are sites ?

Spinal or LP needle is passed between 3rd and 4th or between 4th and 5th lumbar vertebra (L3-L4 or L4-L5) and CSF is obtained from the subarachnoid space

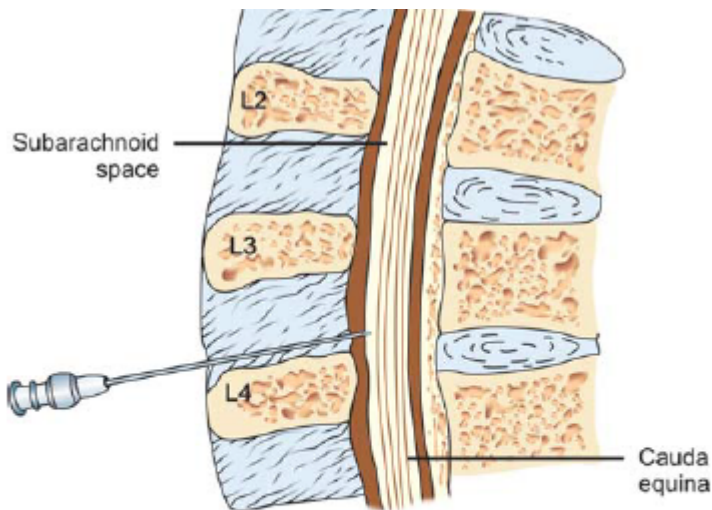


Fig. 6.2: Site of lumbar puncture. Structures through which needle passes are skin/superficial fascia, ligaments, epidural space, dura mater, subdural space, arachnoid mater and subarachnoid space

CSF CHART-1

1. A 9 year old child presented with high grade fever, vomiting and neck rigidity. Results of CSF examination given below.

Color		Pale white
Turbidity		Hazy
Cobweb		Absent
Protein		1.2 g%
Sugar		18 mg%
Chloride		102 mg%
Cell count		1050/mm ³
Cell type	Neutrophils	85%
	Lymphocytes	15%

1. What is your diagnosis?

Ans. Bacterial Meningitis

- High protein (1.2 g%)
- Low sugar (18 mg%)
- Increased cell count (1050/mm³)
- Predominantly neutrophils (85%)

2. What are the cause of this condition?

- *Neisseria meningitidis*
- *Streptococcus pneumonia*
- *Hemophilus influenzae*

3. What are the clinical manifestations?

- High fever
- Vomiting
- Neck rigidity
- Altered sensorium
- Seizures
- Kernig's/Brudzinski's sign +ve

CSF CHART-2

2. 45 year old male presented with headache, vomiting and neck rigidity.
Results of CSF examination given below.

Color		Colorless
Turbidity		Nil
Cobweb		Present
Protein		250 mg%
Sugar		40 mg%
Chloride		72 mg%
Cell count		310/mm ³
Cell type	Neutrophils	30%
	Lymphocytes	70%

1. What is the diagnosis?

Tubercular Meningitis (TBM)

Solution- CSF shows:

- High protein (250 mg%)
- Low sugar (40 mg%)
- Low chloride (72 mg%)
- Lymphocyte predominance (70%)
- Cobweb present

2. Mention the modes of infection?

Modes of Infection- Hematogenous spread from lungs

- Direct extension from TB focus
- Reactivation of latent CNS infection

3. What other tests help in the diagnosis?

- CSF AFB stain
- CSF TB culture
- GeneXpert MTB/RIF
- CSF ADA levels
- Chest X-ray/CT
- Mantoux test

CSF CHART-3

3. 16year old child presented with high grade fever, vomiting and neck rigidity. Results of CSF examination given below.

Color		Colorless
Turbidity		Nil
Cobweb		Nil
Protein		120 mg%
Sugar		68 mg%
Chloride		106 mg%
Cell count		80/mm³
Cell type	Neutrophils	10%
	Lymphocytes	90%

1. What is the diagnosis?

Ans .Viral Meningitis (Likely aseptic)

Solution- CSF shows:

- Mild ↑ protein (120 mg%)
- Normal sugar (68 mg%)
- Lymphocyte predominance (90%)

2. Which organisms produce this condition?

Ans - Enteroviruses (coxsackie, echo)

- Mumps virus
- Herpes simplex virus
- Arboviruses

3. What other tests help in the diagnosis?

Ans. - CSF PCR for viral DNA/RNA

- Viral serology (IgM)
- CSF culture (viral)

