

Lymphoma

These are malignant tumours arising from lymphoid tissue.

Classified into $\left\{ \begin{array}{l} \text{Hodgkin lymphoma} \rightarrow \text{Presence of Reed Sternberg cell} \\ \text{Non-Hodgkin lymphoma} \rightarrow \text{Absence of (RS) cell} \end{array} \right.$

Hodgkin lymphoma $\rightarrow$ Tumor.
 $\downarrow$ lymphocytes
 $\downarrow$ Especially B cells
 $\downarrow$ Named after Thomas Hodgkin.

Etiology: Genetic Predisposition, Viral Infection (EBV, HIV, Drug and chemicals, Unclear though

Pathology

- They spread contiguously
- Rarely extranodal sites in beginning
- Presence of Reed Sternberg cells.

Reed Sternberg cell $\rightarrow$ large Multinucleated cells where two cells are fused together with nuclei being arranged in mirror image in histological slides.



$\downarrow$
looks like
"owl eye"

$\rightarrow$ They don't produce antibodies.

Surrounded by Inflammatory cells (T cells).

Activate Fibroblasts $\rightarrow$ Make collagen.

Activate Eosinophils.

$\rightarrow$ They are clone of ^{neoplastic} B-lymphocytes in the germinal center of lymphoid organ $\rightarrow$ Escaped apoptosis.

Abnormal Rearrangement of Ig Genes,

↓
Divides uncontrollably → Neoplastic.

Ryer Classification

1) Nodular Sclerosis 30-40%.

- Most common subtype.

→ Neoplastic cells are surrounded by collagen by fibroblast and produce nodules.

→ "Lacunar cells" are seen - which looks like middle of lake.

2) Mixed cellularity 20-30%.

- Second most common.

- Mixed surrounding of cells like neutrophils, eosinophils, lymphocytes, plasma cells, histocytes.

3) Lymphocyte Predominant 10-20%.

- Surrounded by lymphocytes.

- Better prognosis.

4) Lymphocyte depletion: 10%.

- Dominance of RS cells and depletion of lymphocytes.

Newer Classification By WHO

1) Classical Hodgkin lymphoma

→ Don't express CD45 or CD20 in B cell

→ Express CD15 & CD30

1) NS 2) MC 3) LP 4) DD.

ii) Nodular lymphocyte Predominant HL

- More common in Men.
- Expresses CD20 & CD45, Don't Express CD15 & CD30.
- They are lymphocyte predominant cells with "lobulated cells" looks like a "Pop corn" 
- Nodules are formed by the lymphocytes.

Clinical Features

- 1) Painless, Rubbery lymphadenopathy usual in cervical, axillary and mediastinal nodes.
- 2) Patient develop Pel Ebertin fevers (Come and go).
- 3) Mediastinal lymphadenopathy causes
 - ↳ Cough and shortness of Breath → Compression of Airway
 - Hoarseness → Recurrent laryngeal Nerve
 - Superior Vena Caval syndrome →
 - Pleural Effusion → By Infiltration into pleural space
- 4) They release Cytokines which reach the kidney and damage Nodocytes causing Minimal change Disease.
- 5) Usually 1% of people affected, 2nd decade, Men usually.

Investigations

- 1) CBC → Normochromic Normocytic Anemia.
↑ ESR ↑ LDH
- 2) Bone Marrow Trephine Biopsy
- 3) FNAC
- 4) Excisional Biopsy
- 5) Renal Function Test
- 6) PET / CT is the main investigation. Gold standard.

Ann Arbor staging system:

Stage I $\rightarrow$ 1 lymph node

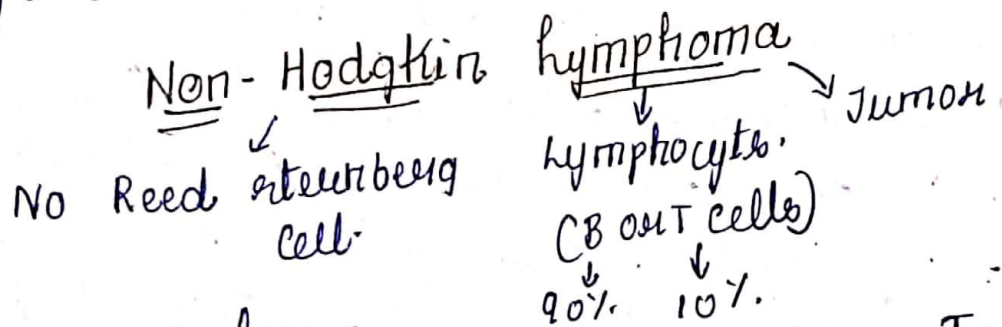
Stage II $\rightarrow$ Multiple lymph node on 1 side of diaphragm.

Stage III $\rightarrow$ Multiple lymph node on both side of diaphragm.

Stage IV $\rightarrow$ Metastatic - Involving liver or Bone Marrow.

Treatment

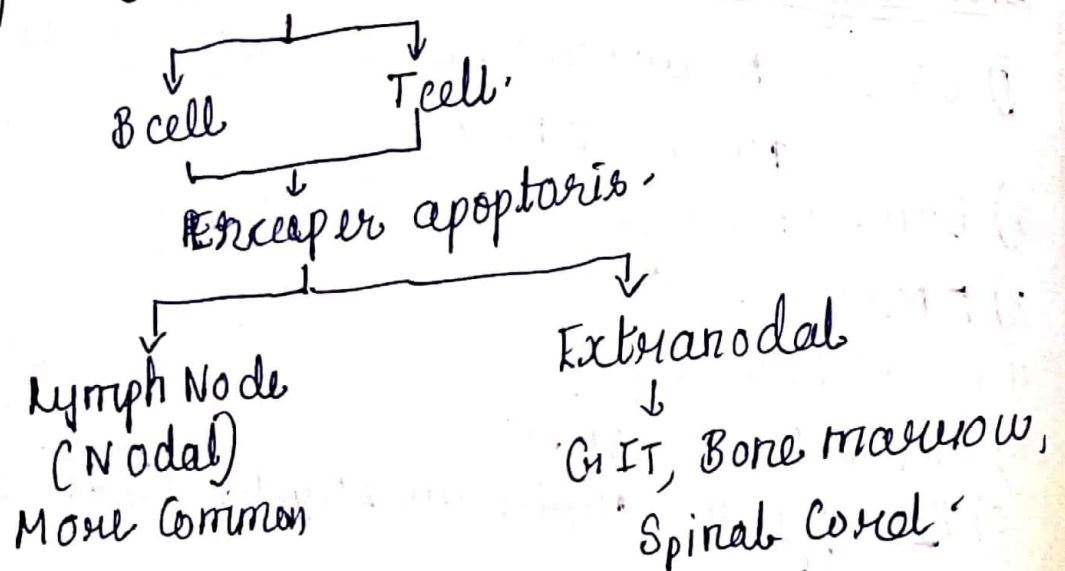
- Depends on stage, Age & General health.
- Chemotherapy & Radiotherapy.
- Prognosis - Better than Non-Hodgkin.



Etiology $\rightarrow$ unclear.

- $\rightarrow$ HIV, Epstein Barr Virus, HPV, Human T cell lymphotropic virus, adult T cell leukemia lymphoma.
- $\rightarrow$ Chromosomal Translocations.

Pathology $\rightarrow$ Genetic mutation.



① Non-Hodgkin B cell lymphoma → Most common.

↳ Expresses CD20, can be indolent, aggressive or highly aggressive.

① Diffuse large B cell lymphoma → Most common and aggressive.

② Follicular lymphoma → Indolent, chromosomal translocation of 14 and 18 $t(14:18)$, overexpression of BCL2 which blocks cell death.

③ Burkitt lymphoma → Highly aggressive.

- Chromosomal translocation of 8 and 14 $t(8:14)$
overexpression of MYC gene, which ↑ cell division.

→ In Africa it cause -

→ Extranodal involvement of Jaw.

→ Associated with Epstein Barr Virus (Incorporates DNA of EBV to host DNA)

→ Outside Africa it cause

→ Extranodal involvement of Abdomen (Ileum).

→ less associated with EBV.

O/E of Microscope:

→ "Starry Sky" → Neoplastic lymphocyte.

↳ Macrophages have eaten some neoplastic cells.

④ Mantle cell lymphoma → Aggressive.

→ Chromosomal translocation of 14 and 11 $t(14:11)$.

→ overexpression of BCL1 which promotes cell growth.

⑤ Marginal ~~cell~~ zone lymphoma - Indolent.

→ Commonly in Mucosa Associated lymphoid tissue.

→ Nodal & splenic also present

6) Lymphoplasmacytic lymphoma → Indolent.

- Involves Bone marrow, lymph nodes, spleen.
- Neoplastic cells produce Immunoglobulins, M proteins which cause Blood to get thick and viscous → Waldenström macroglobulinemia.

Non-Hodgkin T cell lymphoma

1) Adult T-cell lymphoma (Leukemia)

- Caused by Human T-lymphotropic virus (DNA mutation)

2) Mycosis Fungoides:

- T cell lymphoma of skin looks like fungal infection.
- O/E of Microscope → "Cerebriform" Nucleus like Brain.

Clinical Features

- Painless lymphadenopathy, fever, night sweat, weight loss.
- Extranodal → GI-Bowel obstruction,
Bone marrow → Fatigue, Infection, Easy bruising.
Spinal Cord → Loss of sensation.
- Compression syndrome like ascites, SVCs, GI obstruction.

Investigation

- CBC, Bone marrow aspiration, Trefine Biopsy, FNAC, Excisional Biopsy, PET/CT.
- HIV, Hepatitis B, Cytotyping. Uric acid levels.
- Staging → Same as HL, But usually present in Stage III & IV.

Management → Chemotherapy. Radiotherapy.

Prognosis → Low grade → 12 years.

High grade → very low.