LYMPHATIC SYSTEM

Lymphomas

★ **Definition:** Primary malignant tumors of the lymphoid tissues.

★ **Predisposing factors:** Unknown but it may be due to viral infection (e.g Epstein-Barr virus), immunological deficiency, prolonged immunosuppression after organ transplantation, AIDS and autoimmune diseases, Sjogren's disease & systemic lupus erythomatosis.

★ **Pathology:**

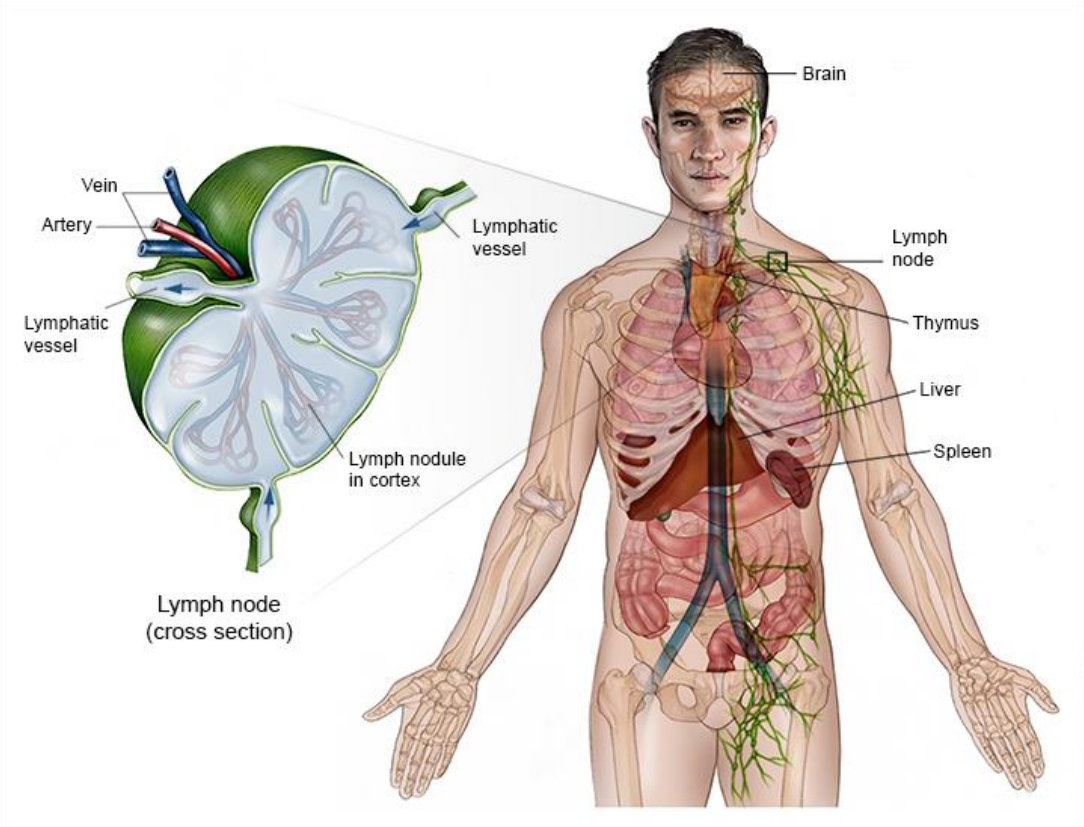
I) Gross Picture:

1. **Sites:** in **any lymphatic tissue** e.g. L.Ns , spleen, liver ,thymus, bone marrow etc.....
2. **Types: Hodgkin's lymphoma , non-Hodgkin's lymphoma** *&* **Burkitt's lymphoma.**

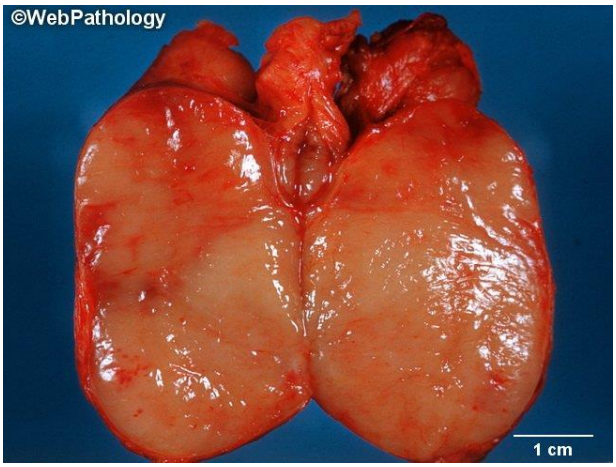
A) Hodgkin's Lymphoma	B) Non-Hodgkin's Lymphoma
1. The **commonest** type.	1. **Less** common
2. **Moderate enlargment** of L.Ns.	2. **Marked enlargment** of L.Ns.
3. **Delayed invasion** of the capsule & surrounding structures.	3. **Early invasion** of the capsule & surrounding structures.
4. **Spread** mainly by lymphatics to the other groups of L.Ns.	4. **Early lymphatic spread** to the other groups of L.Ns.
5. Blood spread is late to extra-nodal sites.	5. **Early blood** spread to extra-nodal sites.
6. Pinkish white with **minimal** hemorrhage & necrosis in **cut section.**	6. **Greyish white with wide areas of hemorrhage** & necrosis in **cut section**.

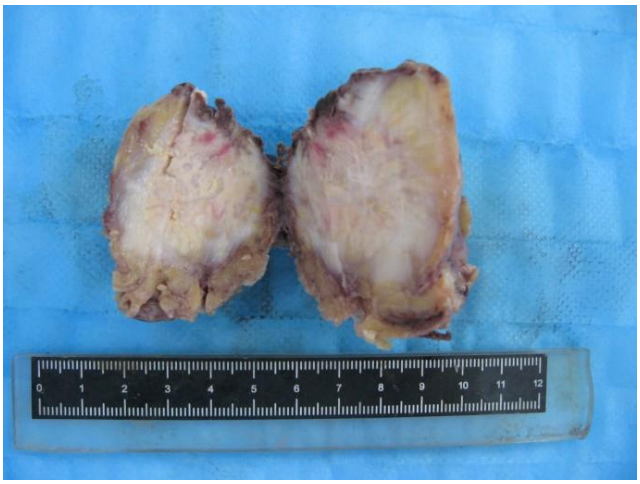
C) Burkitt's lymphoma: It is thought to be related to Epestein - Barr- virus which cause lymphoma in patient with chronic malaria.

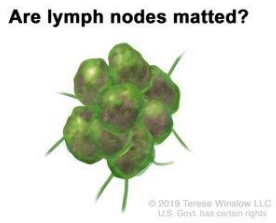
Lymphatic System



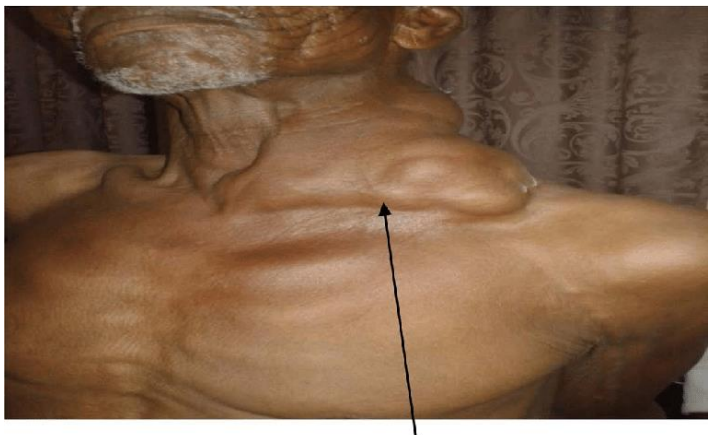
Hodgkin's Lymphoma **Non-Hodgkin's Lymphoma**







Hodgkin's Lymphoma

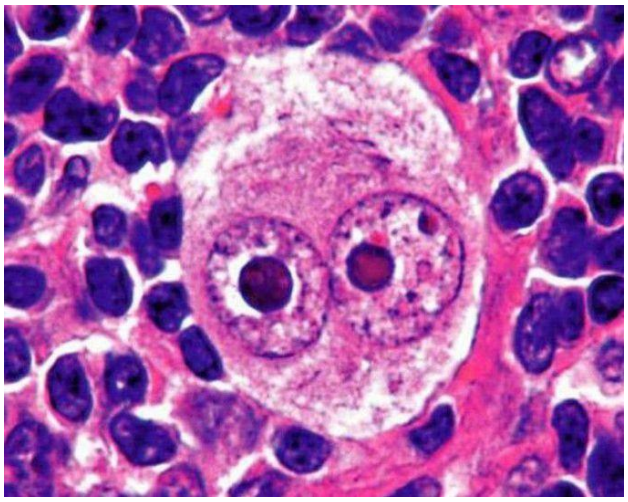


Cervical and supraclavicular lymph node mass

II. Microscopic Picture and Classification:

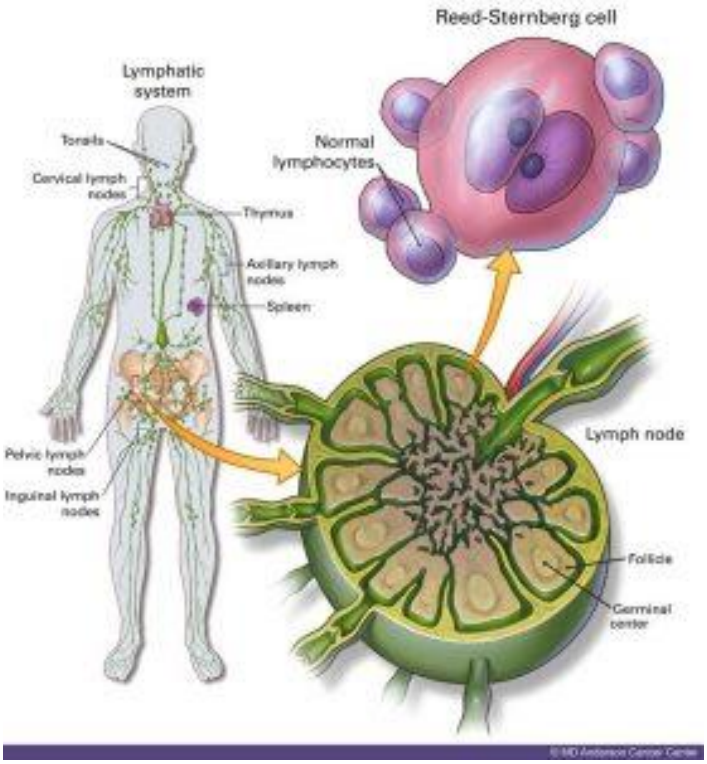
1) Hodgkin's disease*:*

- It is essential to identify **Dorothy-Reed-Sternberg cells** in order to establish the diagnosis of Hodgkin's disease.
- **Dorothy-Reed-Sternberg cells** are giant cells with multinuclei (2-8 nuclei) arranged in a mirror image in the center of the cells.



Dorothy-Reed-Sternberg cells

- The cellular origin of Hodgkin's disease is not yet established.



- It is further divided into 4 histological subtypes in descending order of prognosis.

	1- Lymphocytic predominance	2- Nodular sclerosis (Commonest)	3- Mixed cellularity	4- Lymphocytic depletion
1- Lymphocytes	· Excess	· Moderate	· Moderate	· Absent
2- Thickening of capsule of L.N & fibrous septa divided its architecture	· Absent	· Present	· Absent	· Absent
3- Mixed cells (lymphocytes , oesinophils ,plasma cells, neutrophils etc)	· Absent	· Present	· Excess	· Absent
4- Prognosis	· Good	· Good	· Bad	· Very Bad

2) Non-Hodgkin's lymphomas*:* is classified into

1. Histocytic lymphoma
2. Lymphoblastic lymphoma.
3. T cell lymphoma.
4. B cell lymphoma.

3) Burkitt's lymphoma: It is a malignant tumor of B lymphocytes .

III- Staging of lymphoma: (to determine the proper line of treatment).

a) **Stage 1:** affection of L.Ns. in **one anatomical region**.

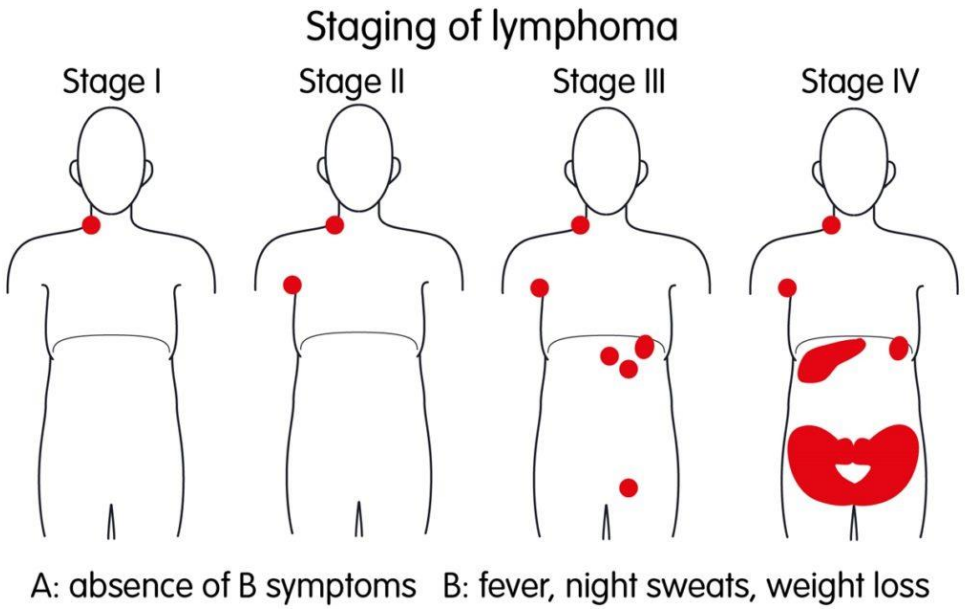
b) **Stage II:** affection of L.Ns. in **more than one anatomical region** in **one side** of the diaphragm.

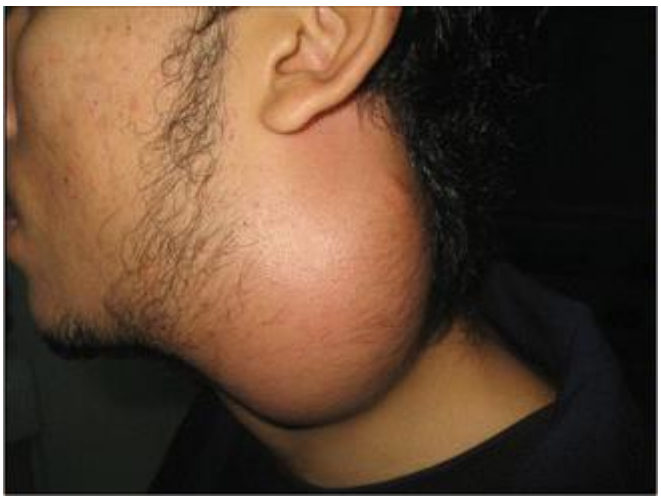
c) **Stage III:** Affection of L.Ns. on **both sides of diaphragm**. Splenic affection is diagnosed as IIIs.

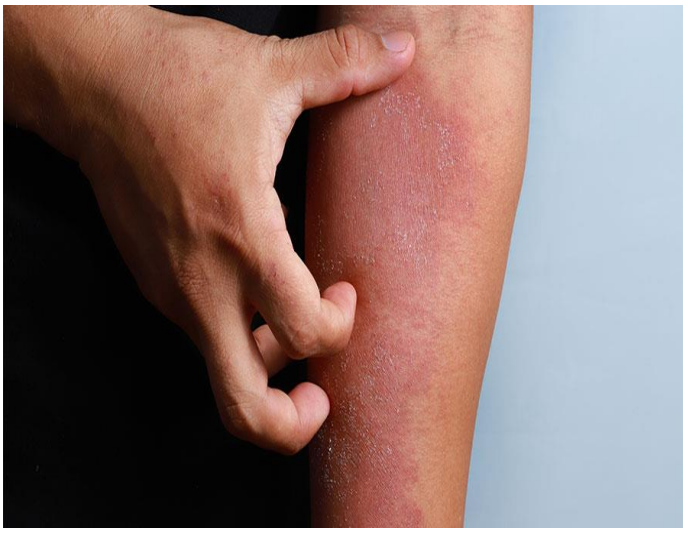
d) **Stage IV: disseminated extra-nodal** affection as skin, liver, lung, G.I.T or bones.

♦ Each stage is further subdivided into **A & B** (according to the presence of systemic manifestations), or **E** (localized involvement of an extra-lymphatic organ).

Lymphatic System

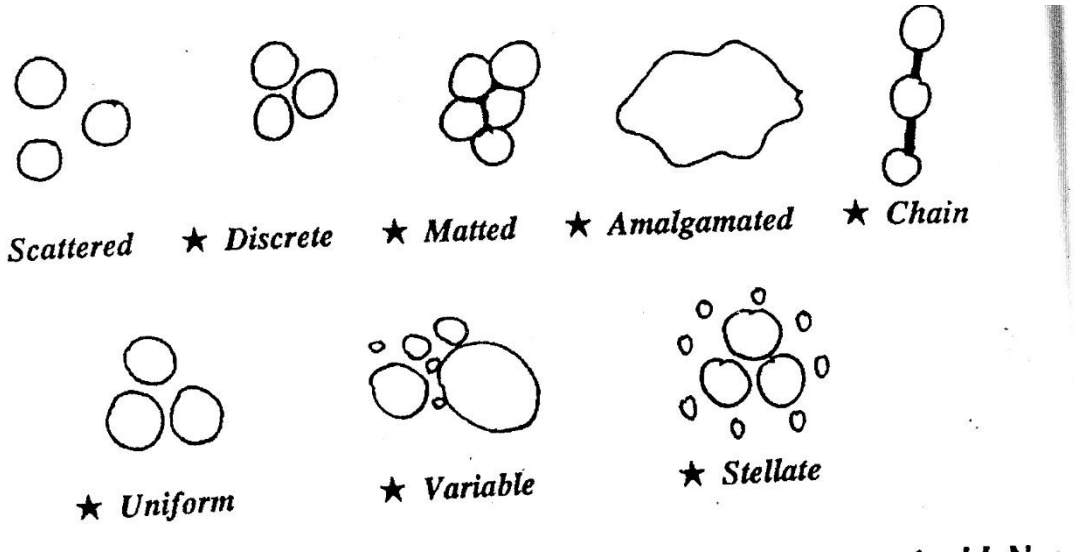






Non-Hodgkin's Lymphoma

Skin manifestations



★ Clinical Picture:

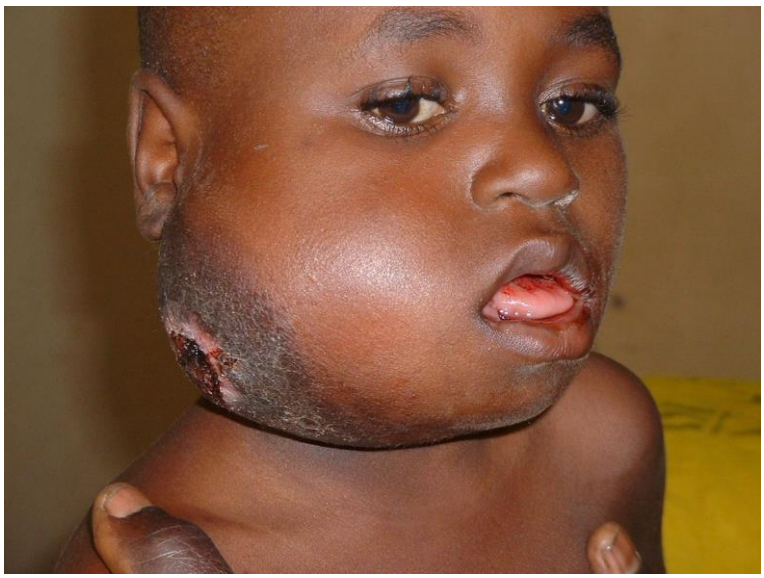
A) Hodgkin's Lymphoma	B) Non-Hodgkin's Lymphoma
I. **Age**: 2 peaks, 15-35 & above 50 years. II. **Sex**: more in male.	I. More in old age. II. More in males.
III. General Manifestation	
• **Common in late stages** : 1. **Fever**, Sometimes **Pel-Ebstein fever** occurs (few days of fever alternating with few weeks of freedom) 2. **Night sweat**. 3. Unexplained **loss of whight** 4. Pruritis, skin eruptions, fatigue, anaemia, malaise.	• Usually not present.
IV. Local Manifestations	
1. The commonest presentation is painless progressing enlargement of LNs.	
2. Usually starts in the **cervical L Ns.** then become generallized.	2. It does **not follow any anatomical** pattern
3. The affected lymph nodes	
a) **Early**: enlarged, mobile painless, not tender, discrete, firm (rubbery). • They vary greatly in size, the large glands lying towards the center of the mass (satellite appearance). b) **Late**: Fixed, painful matted *&* firm.	a. **Early**: mobile, painless, not tender, discretre and hard. b. **Late**: (usually seen in this stage). • Fixed, painful amalgamated by infiltration. • Variable consistency but usually hard. • Pressure on the surrounding structures. • Fungation through the skin.

4. **In late cases***,* many groups of lymph nodes are affected with variable sizes with hepatomegaly, jaundice, ascites, splenomegaly *&* IVC. compression, mediastinal syndrome, S.V.C compression, pleural effusion, bony pain and spinal cord compression.

★ **N.B.: Non-Hodgkin's Lymphoma is characterized by the followings :**

- ♦ It is more likely to present in **extranodal sites** than Hodgkin's lymphoma.
- ♦ The disease is usually **disseminated** at the time of presentation.
- ♦ **Mycosis fungoides** is a type of NHL which presents by skin eruptions.
- ♦ **Gastric lymphoma** produces manifestations similar to carcinoma of the stomach.
- ♦ **Intestinal lymphomas** may produce intestinal obstruction, bleeding or perforation.

C) Burkitt's Lymphoma: A rare type of lymphoma occurs in the jaw & ovaries. It affects children and is endemic in eastern Africa which is known to be endemic for malaria.



★ Investigations:

- **Aim:** Diagnosis of the cause of lymphadenopathy *&* staging of the disease.

1. **L.Ns biopsy** is diagnostic & the **most important** investigation.
   - The neck is the preferred site.
   - Inguinal LNs biopsy should be avoided as the usually enlarged due to chronic non-specific lymphadenitis.

2. **Laboratory investigations:**
   a) Blood picture: may show anaemia and lymphocytosis in Hodgidn's disease.
   b) E.S.R. is raised in advanced cases
   c) Tumor markers: Lactic dehydrogenase and beta-2 microglobulin are elevated and used for follow up.
   d) Renal and liver function tests (if impaired, liver biopsy is indicated).
   e) Serum alkaline phosphatase for affection of bones or liver.

3. **Radiological investigations:**
   a) ***Chest and bone X*****-r**ay: to detect mediastinal L.Ns. *&* bone involvement.
   b) Mediastinal and abdominal ***U.S, C.T. scan & MRI***Nowadays, they replace lymphangiography *&* staging laparotomy.
   c) ***Barium study of G.I.T.***

4. ***Bone marrow biopsy*** from iliac crest can be done.
5. **Immunophenotyping:** Identify subtype of lymphoma and leukaemia.

★ Treatment:

A - Hodgkin's disease:

1. **Stage I & II_A**: Radiotherapy.
2. **Stage II_B**: Radiotherapy & combination chemotherapy.

B- Hodgkin's disease Stages III & IV, Non-Hodgkin's lymphomas & Burkitt's lymphoma: Mainly combination chemotherapy followed by radiotherapy especially for bulky sites.

Tuberculous Lymphadenitis

★ **Incidence:** This condition usually affects poor children.

★ **Aetiology:**

A) Predisposing factors: Poor classes, bad health habits, poor general resistance, deficient diet, other debilitating disease, exposure to a source of infection, intake of infected milk, immune deficiency, D.M & AIDS.

B) Organism: Mycobacterium tuberculosis.

C) Route of infection:

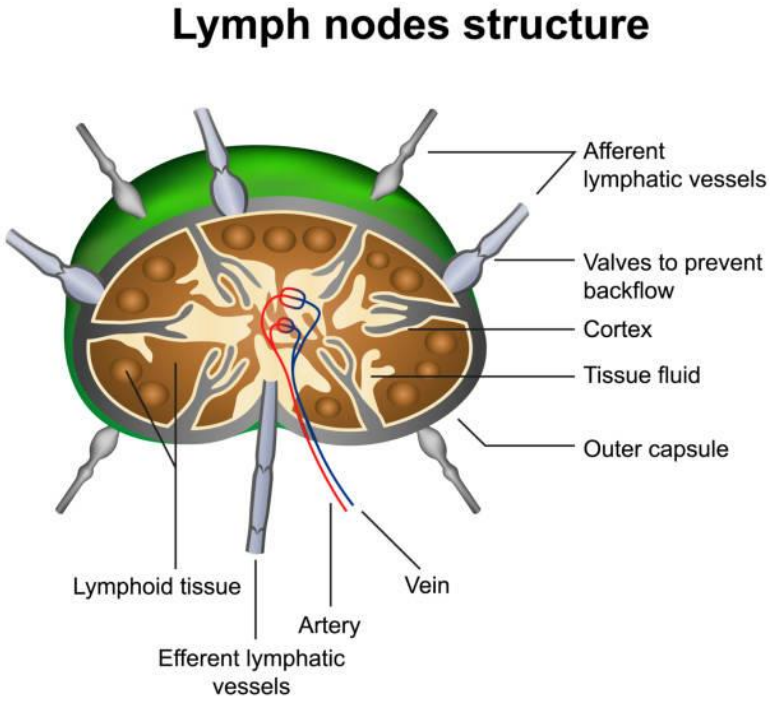
1- Lymph borne type: The commonest.

a) **From the tonsils** → upper deep cervical L.Ns. **(commonest site).**

b) **From the intestine** → mesenteric L.Ns. **(tabes mesenterica).**

c) From the lung → Mediastinal L.Ns. → Lower deep cervical L.Ns.

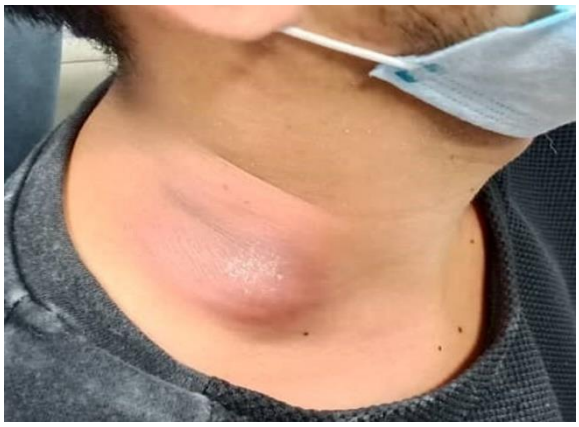
2 - Blood borne type: From any T.B. focus anywhere in the body.



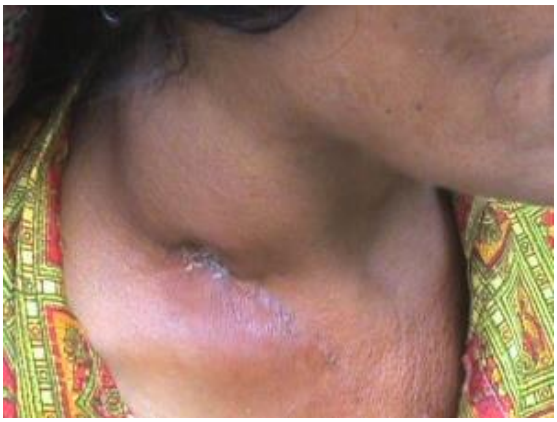
★ Pathology:

A) Gross picture:

1- Lymph borne (caseating) type	2- Blood borne (lymphadenoid) type
1. **Primary** infection 2. **A highly virulent** organism reaches the L.Ns. by the **afferent lymphatics.** 3. Initial lesion occurs in the **cortex**. 4. Infection reaches the capsule → **T.B. periadenitis** → **matting** of L.Ns. 5. Destruction → **caseation** → **cold abscess** → **collar & stud abscess** → **T.B. sinus.**	1. **Secondary** to active T.B. focus. 2. **Weak organism** reaches the L.Ns. by the **artery** at the hilum. 3. Initial lesion occurs in the **medulla**. 4. Infection does not reach the capsule →No periadenitis → **no matting**. 5. **No** caseation → No cold abscess → No T.B. sinus.

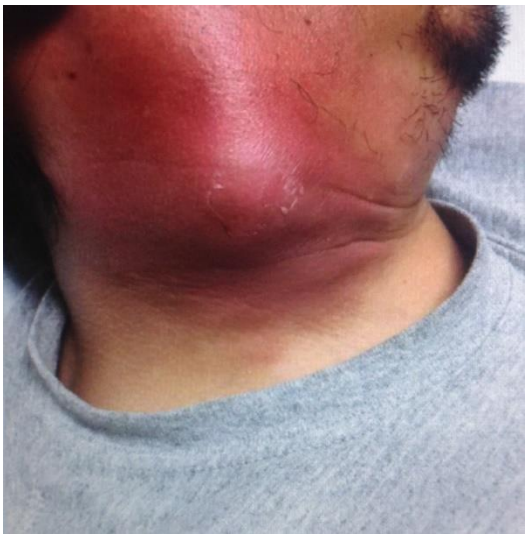


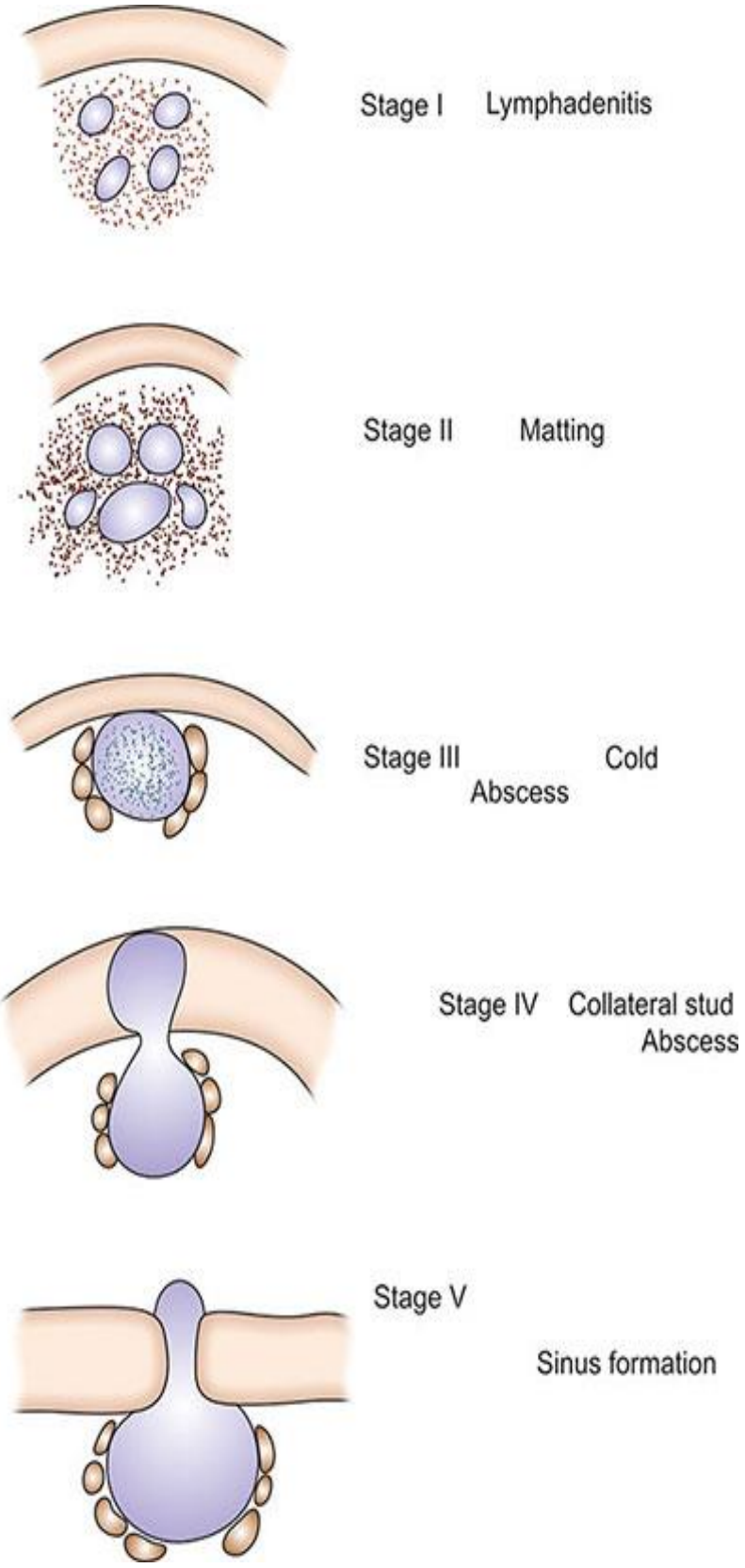
Cold abscess



T.B sinus

Pyogenic abscess




Stage I Lymphadenitis
Stage II Matting
Stage III Cold Abscess
Stage IV Collateral stud Abscess
Stage V
Sinus formation

B- Microscopic picture: Multiple tubercles each consists of:

1. **Central zone:** Structureless eosinophilic **caseous** material containing bacilli.
2. **Mid-zone: Epithelioid** cells and **Langhan's giant cells** (peripheral multinuclei arranged in horse shoe manner).
3. **Peripheral zone: lymphocytes**.

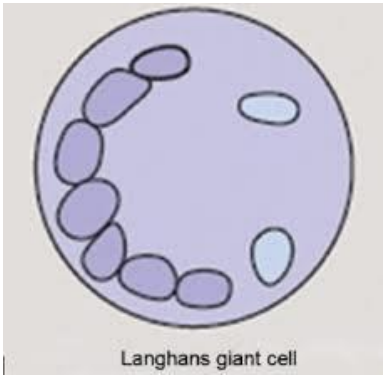
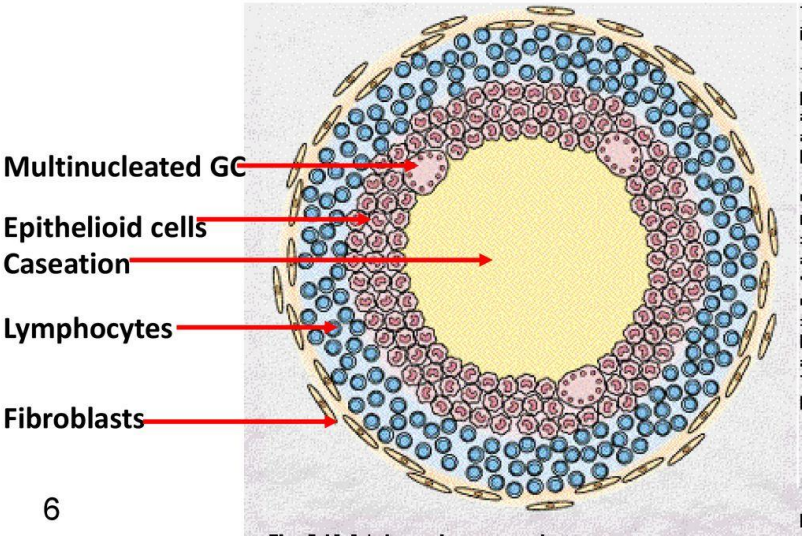


Diagram of typical TB granuloma



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★ **Complications:**

1- **Cold abscess** → perforate deep fascia → **Collar and stud abscess** (bilocular abscess) → skin break down → **T.B sinus** → Secondary **T.B of the skin**.

2- **Secondary infection** → treatment is more difficult.

3- **Spread** to other groups of L.Ns. or miliary T.B.

4- Rarely pressure on the surrounding structures e.g. O.J & mediastinal syndrome.

★ Clinical picture:

1- Lymph borne type	1- Blood borne type
I) General: **1) More common** & usually in **children**. **2) T.B. toxaemia is minimal** **3) No evidence of lry T.B. focus.** **II) Local:** **1) Localised** lymphadenopathy. **2) Variable consistency**: ♦ Early → fiim ♦ Caseation → Cystic ♦ Calcification → hard **3)** L.Ns. are **matted** or arranged in **beads and strings**.	**I) General:** **1) Rare** & usually in **old**. **2) T.B. toxaemia is marked.** **3) Manifestations of lry T.B. focus.** **II) Local:** **1) Generalised l**mphadenopathy. **2) Firm** in consistency. **3)** L.Ns. are **discrete**, not tender & uniformly enlarged and mobile

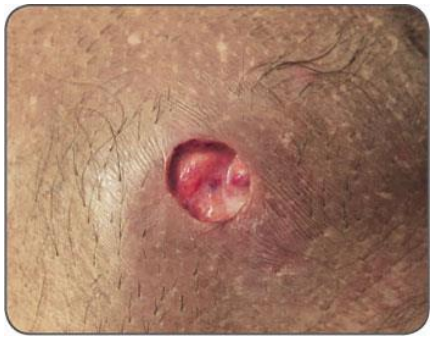
d - Manifestations of complications: (In lymph borne type only).

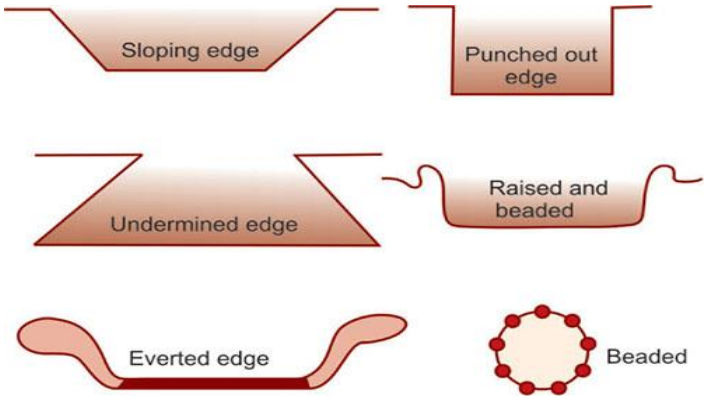
l- Cold abscess: Cystic swelling in the anatomical site of L.Ns. slightly tender, slightly warm with the overlying skin is first normal then it becomes dusky red.

- The cold abscess is actually ***not cold*** (it is warm but colder than pyogenic abscess) and ***not abscess*** (the contents are not pus).

2- Collar and stud abscess: S.C. ill-defined cystic swelling with another deep cystic swelling with cross fluctuation in between.

3- Sinus: A track can be felt as a thick fibrous cord, has a thin bluish margin, undermined edge with thin serous yellowish discharge.





★ **Investigations:** (Mention in any T.B.)

1- **Blood picture**: usually shows anaemia and leucopenia with relative lymphocytosis.
2- **E.S.R.** important for follow-up.
3- **Plain X-ray** chest and abdomen.
4- **Tuberculin test:** if -ve it excludes T.B. in unimmunized person in non-immunized area.
5- **Bacteriological examination** for the aspirate **of cold** abscess **or** discharge of a sinus, it includes:
   a) Film stained by Zeil Neilson stain.
   b) Culture & sensitivity
   c) Polymerase chain reaction.
6- **L.N. biopsy is diagnostic** and most important investigation.

★ **Treatment:**

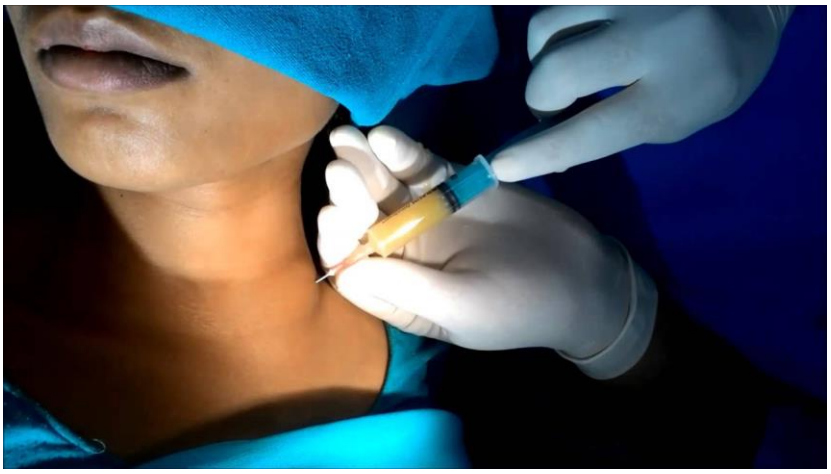
I) Lymph borne type:

1. **Before caseation:**
   a) **Medical treatment**: At least 2 antituberculous drugs for at least 9 months, good diet and sanatorium.
   b) **Excision of a single group** of L.Ns. if there is no response to medical treatment for 6 months.
2. **After Caseation:** (Cold abscess)

- **Antituberculous drugs** with repeated **aspiration** & injection of **streptomycin**.
- **Aspiration** should be: (avoid infection & sinus formation)
  - Under complete **aspetic technique**.
  - In a **non-dependent** part.
  - In a **healthy skin** away from the abscess in a **valvular** manner. The needle pricks the skin, is advanced for a distance through the S.C tissue and is finally passes deeply to enter the abscess cavity.
  - Stop aspiration when blood appears in the aspirate

(aspiration is **complete**).

- Aspiration is **repeated** once the abscess refills.



3. **Incision and drainage:** If there is secondary infection.
4. **T.B. sinus:**
   a) **Medical treatment:** Antituberculous drugs & dressing with streptomycin powder until it closes.
   b) **Excision of the sinus** with the underlying L.Ns. if there is no response to medical treatment.

II) Blood borne type: Only medical treatment and no place for surgery.

Acute Lymphadenitis

★ **Aetiology & pathology:**

- Infection passes from septic focus through afferent lymphatics to the draining lymph nodes → acute inflammation of in these lymph nodes.

★ **Complications:**

1- Spread of infection to lymph vessels ,other lymph nodes and surrounding structures.
2- Suppuration and acute abscess formation.

★**Clinical picture:**

1. **General:** Fever, rigors, headache, manifestations of the cause.
2. **Local:**
   - The affected L.Ns. are enlarged, mobile, firm, painfull and tender.
   - The overlying skin is red and warm.
   - The intervening lymphatics between the cause and lymph nodes , appear as red tender streaks (lymphangitis)
   - In neglected cases, suppuration occurs (see C/P of acute abscess).

Vietnamese man with tuberculosis

★ **Treatment:** Treat the cause, antibiotics & local heat. If abscess is formed → incision is drainage.

Chronic Non-specific Lymphadenitis

★ **Incidence :** A very common **clinically unimportant** condition , usually affecting **superficial inguinal** (walking bare foot) and **cervical** (septic tooth, chronic tonsillitis or sinusitis)lymph nodes.

★ **Aetiology & pathology:**

- Infection passes from chronic septic focus through afferent lymphatics to the draining lymph nodes → chronic inflammation of in these lymph nodes.

★**Clinical picture:** Manifistations of the cause & L.Ns. are **small** less than 1cm, **stationary**, firm, discrete, mobile and slightly tender.

★ **Treat the cause.**

Syphilitic Lymphadenitis

★ **Nowadays syphilis is eradicated in most parts of the world.**

★**Syphalis is divided into 3 stages:**

1. **Primary stage:** Genital chancre → inguinal L.Ns of both sides are enlarged, firm, mobile, discrete, painless & not tender.
2. **In secondary stage:** There is generalised lymphadenopathy, L.Ns. (as before), usually affect epitrochlear and cervical L.Ns.
3. **In tertiary stage:** Acute septic lymphadenitis may arise from secondary infection of a nearby gumma (gumma of L.N is extremly rare).

Malignant Lymph Nodes Enlargement

1. **Lymphomas**
2. **Leukaemias** (see medicine).
3. **Metastases*:*** From carcinoma, malignant melanoma or Ewing's sarcoma.

- **Clinical picture:**

a) **Early** the L.Ns are painless, progressive, not tender, discrete, hard & mobile but **later on** become matted, fixed to surrounding structures *&* painful.

b) **Features of the primary growth** usually can be detected but rarely it is in a hidden site e.g. hypopharynx, middle ear, nasal sinus, bronchi, stomach *&* testis.

★ **Treatment:**

A) In early operable cases → excision of the primary tumor with radical dissection of the affected L.Ns.

B) Advanced inoperable cases → palliative chemotherapy or radiotherapy.

Lymphadenopathy

★ It is a lymph nodes **enlargement due to any disease.**

- **N.B:**
  - Normally L.Ns can't be seen or felt.
  - Any lymph node less than ½-1 cm is clinically insignificant.

★The commonest causes of L.Ns enlargement are:

A. Localised lymphadenopathy:

1. Inflammatory:

a. **Acute lymphadenitis:**

- Acute **non-specific** lymphadenitis.
- Acute **specific** as infectious mononucleosis

b. **Chronic lymphadenitis** which may be.

- Chronic **non-specific** lymphadenitis.
- Chronic **specific** lymphadenitis: lymph borne **T.B** & Syphilis (Iry & 3rd) is very rarely nowadays.

2. **Malignant.** Early lymphoma & metastases.

B. Generalized, lymphadenopathy

1. Inflammatory.

a. Blood born T.B lymphadenitis.
b. Second stage of syphilis.
c. Fevers (see medicine).

2. Malignant: Advanced lymphoma, metastases or leukaemia (see medicine).

3. Autoimmune & collagen diseases (see medicine).

Lymphedema

★ **Definition:** It is a hypertrophic condition of the skin & S.C. tissues due to chronic oedema caused by chronic lymphatic obstruction.

★ **Aetiology:**

A- Primary lymphedema: congenital, rare, it is due to:

1. **Aplasia or hypoplasia** of the lymphatics or L.Ns are the **commonest** congenital abnormalities.
2. **Congential dilatation** & tortuousity of lymphatics (varicose lymphatics).
3. **Milroy's disease**: A congenital lymphoedema with family history.

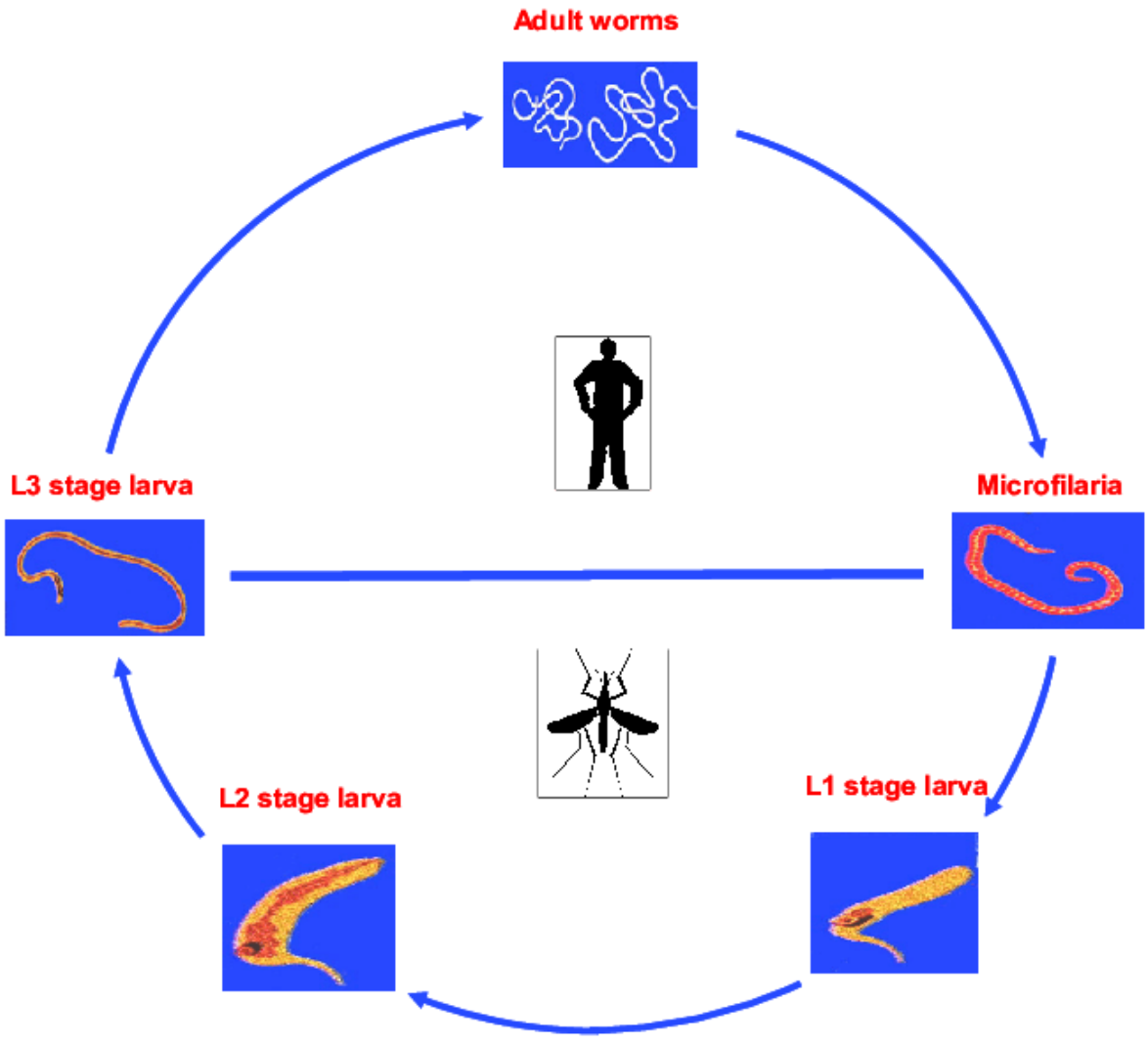
♦ **There are 3 forms** of congenital lymphoedema:

1. **Lymphedema congenita:** Appears at or within one year of birth.
2. **Lymphedema precox:** Appears at adolescence (the **commonest type).**
3. **Lymphdema tarda:** Occurs after the age of **35** years.

B- Secondary lymphedema: acquired, **common**, due to obstruction by:

1. **Traumatic:**
   - **a)** Transverse **incision** for inguinal abscess,
   - **b)** Excess skin loss.
   - c) **Block dissection** of inguinal or axillary L.Ns. in radical vulvectomy or mastectomy respectively.
2. **Inflammatory**: As T.B. lymphangitis or chronic non-specific lymphangitis.
3. **Parasitic:** filariasis is the commonest cause in Egypt. In this condition there is infestation with Wuchereria Bancrofti warm which lives in the lymphatics & L.Ns. of the groin, abdomen and pelvis → lymphatic obstruction.

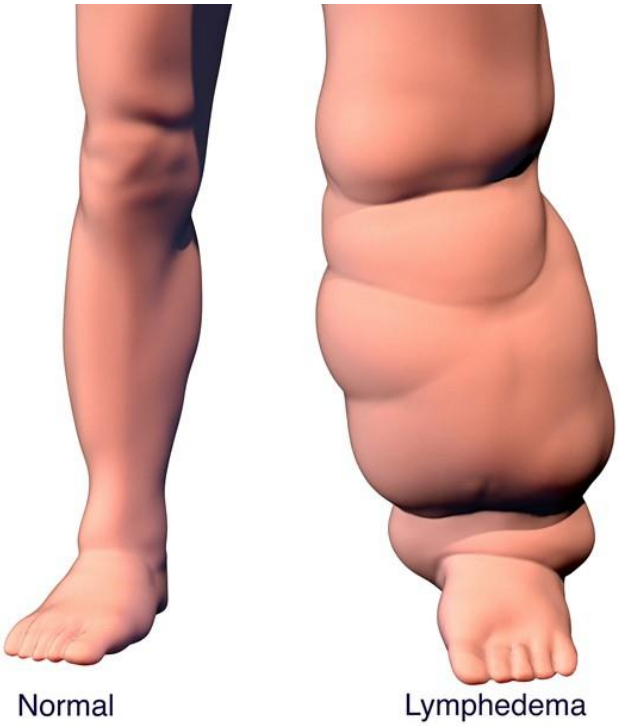
Life cycle of Wuchereria Bancrofti Warm

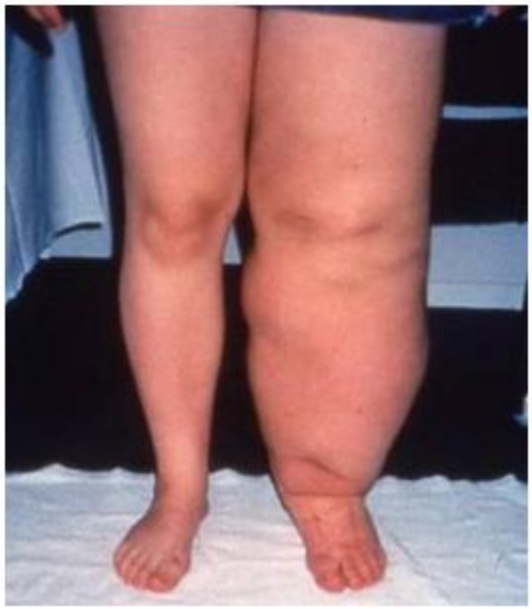


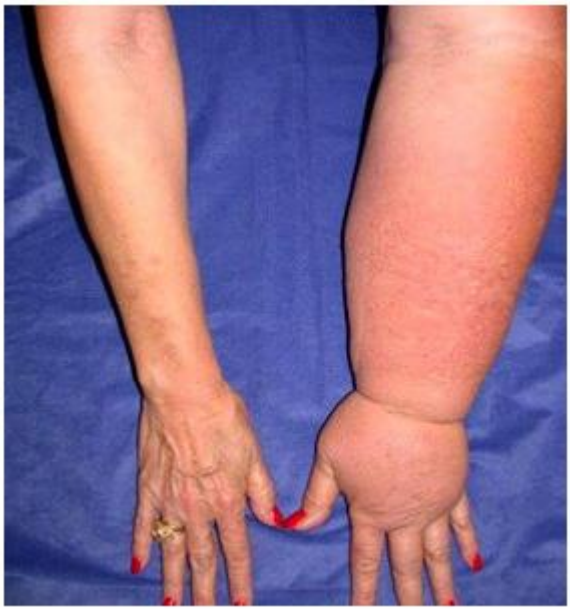
4. **Neoplastic**: May be due to lymphoma or metastasis in the inguinal L.Ns (as in cancer lower ½ of anus, vulva, scrotum) or in the axillary L.Ns (as in cancer breast).

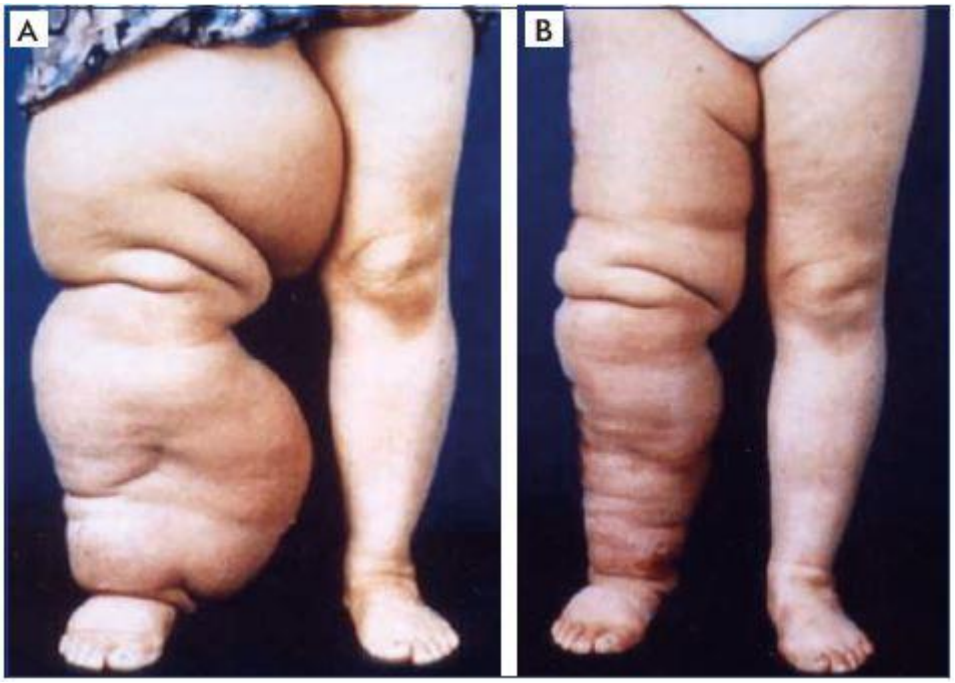
★ Pathology:

1. The condition usually affects **lower limb** (80% of cases) or scrotum & rarely affects vulva, breast, or upper limb.
2. The condition affects **only skin and S.C.** tissue only.
3. Lymphatic **obstruction** → proximal lymphatics **dilate** → lymph **stasis** → recurrent attacks of streptococcal **lymphangitis** → **Progressive lymphatic obstruction**.
5. **The pathology passes into 4 stages**:
   a) **Stage of soft pitting** oedema due to accumulation of protein rich fluid.
   b) **Stage of lymphorrhea** due to rupture of dilated lymphatics.
   c) **Stage of fibrosis** with hard non-pitting oedema.
   d) **Stage of elephantiasis.**



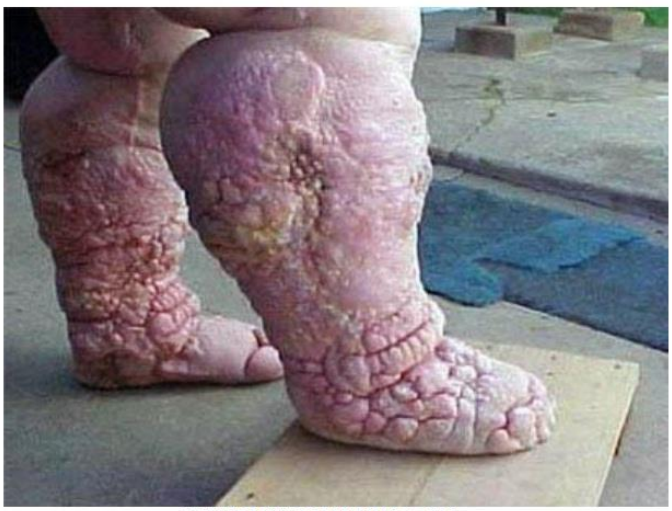






NOT DUE TO
FILARIASIS

NOT DUE TO
PODOCONIOSIS



PRIMARY LYMPHEDEMA

ELEPHANTIASIS NOSTRAS VERRUCOSA

★ **Complications:**

1. Recurrent cellulitis and **lymphangitis**.
2. Formation of **blebs or bullae** due to distended lymphatics.
3. **Lymphoedema ulcer**: rare because diffusion & nutrition of tissues are normal.
4. Huge **disabling limb**.
5. **Lymphangiosarcoma**, is rare.

★ **Clinical picture:**

1. Adult patient from **an endemic area** (e.g. Domiat, Giza, Sharkiaha) complaining of **progressive leg swelling** with exacerbations and partial remissions.
2. **During exacerbations**: (attacks of streptococcal lymphangitis).
   a) **General**: fever, rigor (elephantoid fever).
   b) **Locally** the limb shows red, tender streaks travelling to the draining L.Ns (**lymphangiatis**).
3. The swelling is **hard and non-pitting** with deep **ankle crease** & the **sole** of foot is **not affected**.
4. **In late cases**: (Elephantiasis) Huge limb & the skin is dark, thick with multiple deep furrows, thick callosities and warty over growth.
5. The inguinal L.Ns. may be enlarged, firm and tender **(chronic septic lymphadenitis).**
6. **Other filarial manifestations** as lymphoedema of scrotum, filarial funiculo-epididymitis (acute and chronic), chylocele (rupture of lymphatics in tunica vaginalis). secondary hydrocele, chyluria, chylous ascitis, chylous diarrhea and chylothorax.

★ **Investigations:**

1. **Night blood film** between 10pm-2am may show microfilaria in active filariasis.
2. **Intradermal skin test** for filariasis.
3. **Blood picture:** shows eosinophilia in active filariasis.

4. **Inguinal L.N Biopsy**: May show filariasis or malignancy.
5. **Imaging of lymphatic system:**

a) Lymphoscintigraphy: (recent, simple with no side effects)

- **Indication:** Chronic lower limb edema.
- **Method**.
  - Injection of **technetium 99 labelled antimony trisulfide** into the 1st web and then imaging the extremity with a gamma camera.
  - In lymphatic obstruction ,there are dermal back flow , delay **disappearance** of radioactivity at the injection site with delayed **appearance** of radioactivity in the regional L.Ns.
  - **In venous oedema**, there is normal lymph transport.

b) Near-infrared laser fluorescence imaging:

- It is a dynamic study that allows visualization of lymph flow.
- Indocyanine green is imaged with near-infrared laser light and fluorescence camera to visualize the lymph vessels and nodes.

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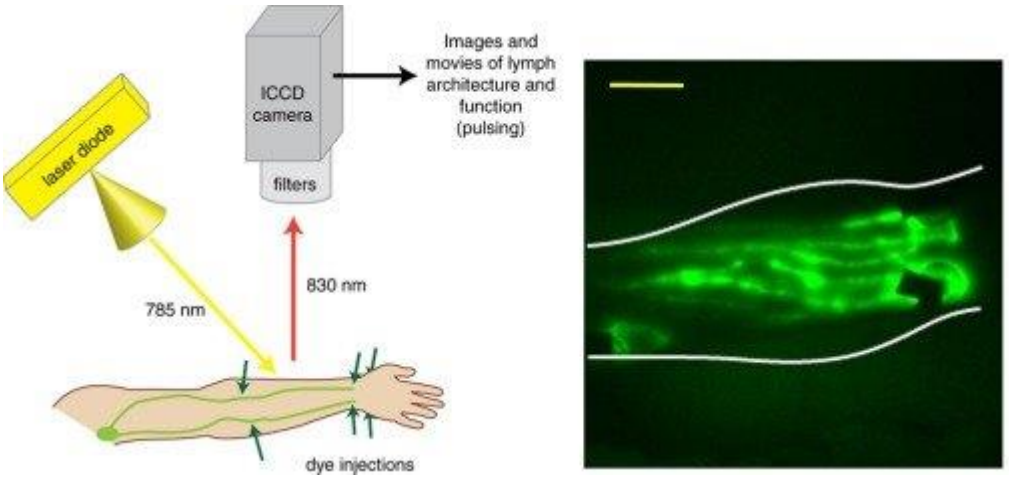
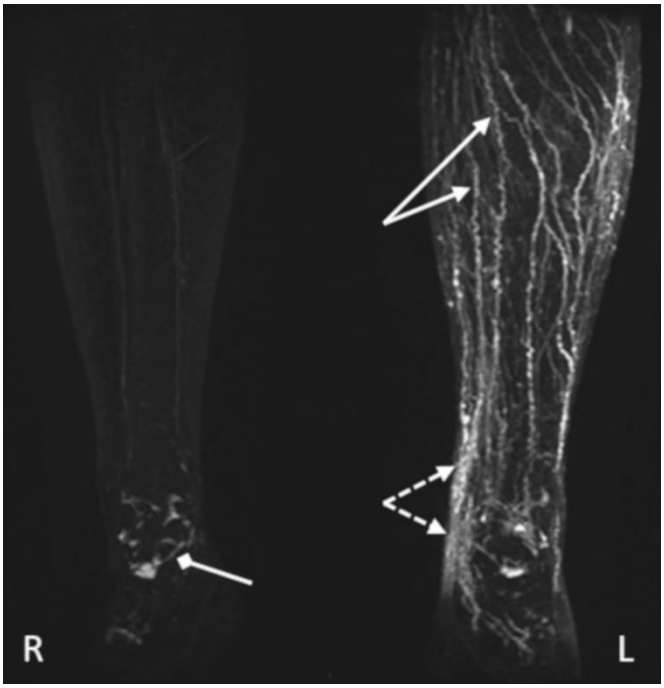


c) Magnetic resonance lymphangiography:

- Injection of contrast medium subdermally and MRI can visualize lymph vessels and nodes.



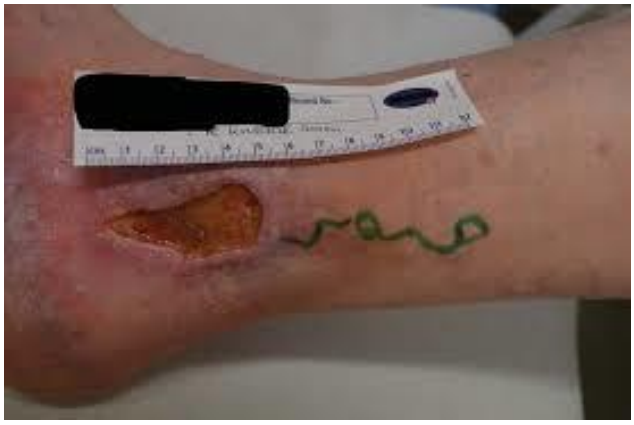
d) Ultrasonography to evaluate edema and fatty tissue in the limb.

★ **D.D.:**

a) The most important is edema due to **chronic venous insufficiency**.

	1- Venous edema	2- Lymphatic edema
1. Manifestations of:	• D.V.T., 2ry V.Vs. pigmentation, ulceration, etc	• Filariasis
2. Pain	• Painful	• Painless(except in lymphangitis)
3.Non-pitting edema	• In late cases	• Early
4. Ankle crease	• Absent	• Present
5. Douplex U/S	• Shows abnormal veins	• Normal veins
6. Lymphoscintigraphy.	• Normal	• Abnormal lymphatics and slow flow of lymph.

b) Causes of elephantiasis: usually chronic lymphatic obstruction (**lymphoedema**) or rarely due to D.V.T. (**post-phlebitic limb**), neurofibromatosis (**elephantiasis neurofibromatosa**), congenital A-V fistula (**local gigantism**), lipoedema (pathological accumulation of fat in the lower limb) or **leprosy**.



Venous edema

Compression garment

★ **Treatment:**

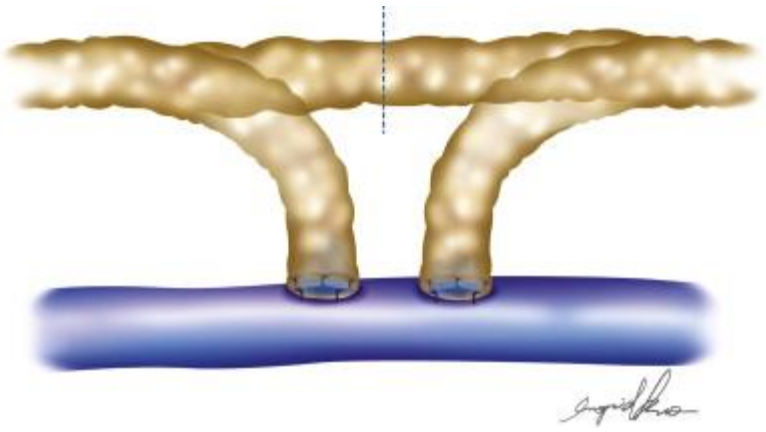
A - Conservative & decongestive therapy: For early cases.

1. Elevation, massage, exercise, compression garments, elastic stocking, diuretics, antibiotics (long acting penicillin every 3 weeks) to prevent lymphangitis, salt restriction, weight reduction, avoid trauma & infection.
2. Diethyl carbamazine in case of filariasis.

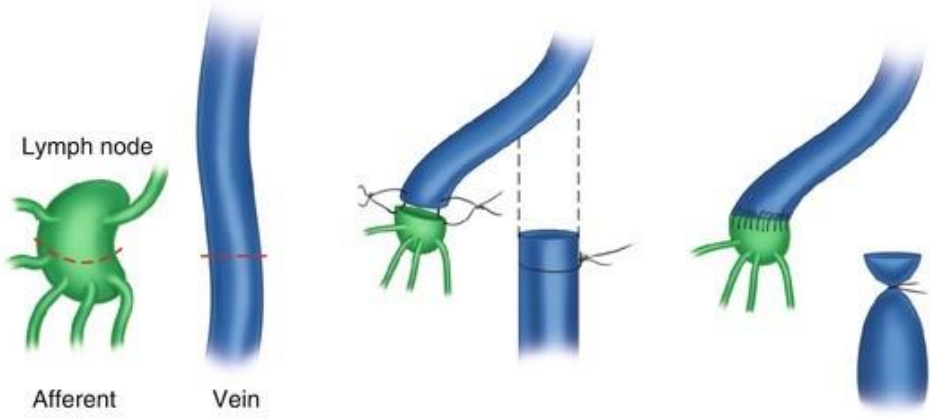
B - Surgical:

I) Physiological operations:

- **Aim**: Improve the lymph drainage of the limb or diversion of lymph across the obstructed zone.
- **Indication:** Early cases.
- **Methods:** The following **microsurgical** operations:
  1. **Lymphatico-venous anastomosis:** The dilated lymphatics are anastomosed to nearby veins.



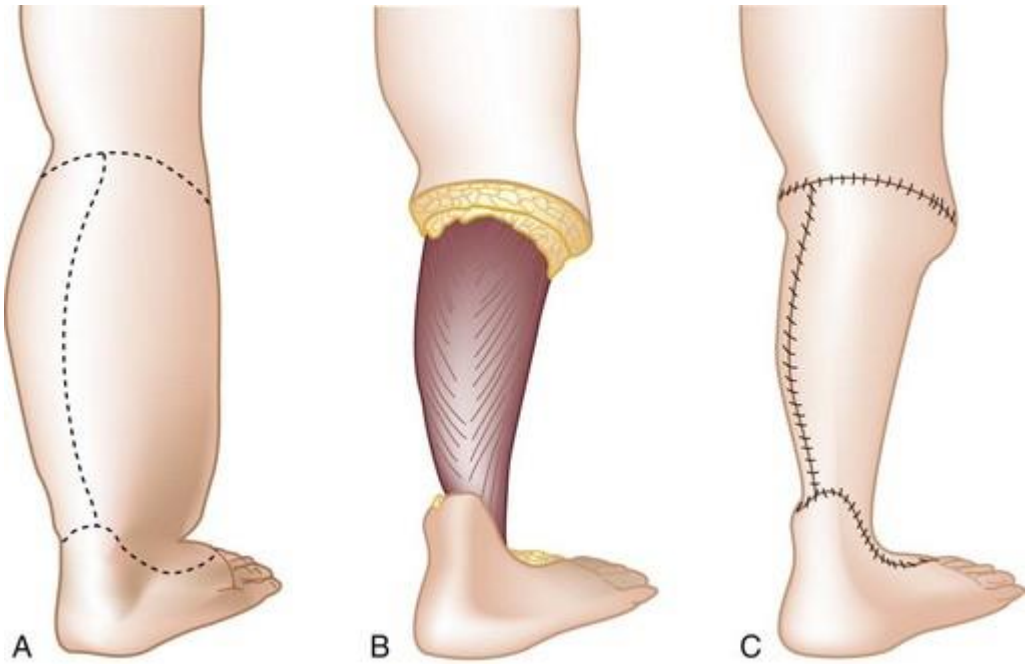
2. **Lymphovenous anastomosis:** The distal surface of bisected L.Ns are anastomosed to a nearby vein.



3. Autogenous lymph nodes **transplantation** to stimulate lymphangiogenesis.

II) Excisional Operations:

- **Aim**: Reduce the bulk of the limb by excision of diseased skin, subcutaneous tissues and deep fascia with closure of the defect by skin graft.
- **Indication**: Advanced *&* complicated cases with marked disability.



III) Liposuction is done to remove residual swelling.

IV) Amputation: For repeated recurrence, huge disabling limb or excessive ulceration and infection.

IV) Plastic reconstruction by excision of hypertrophied tissue is the procedure of choice in the scrotum, vulva or breast.