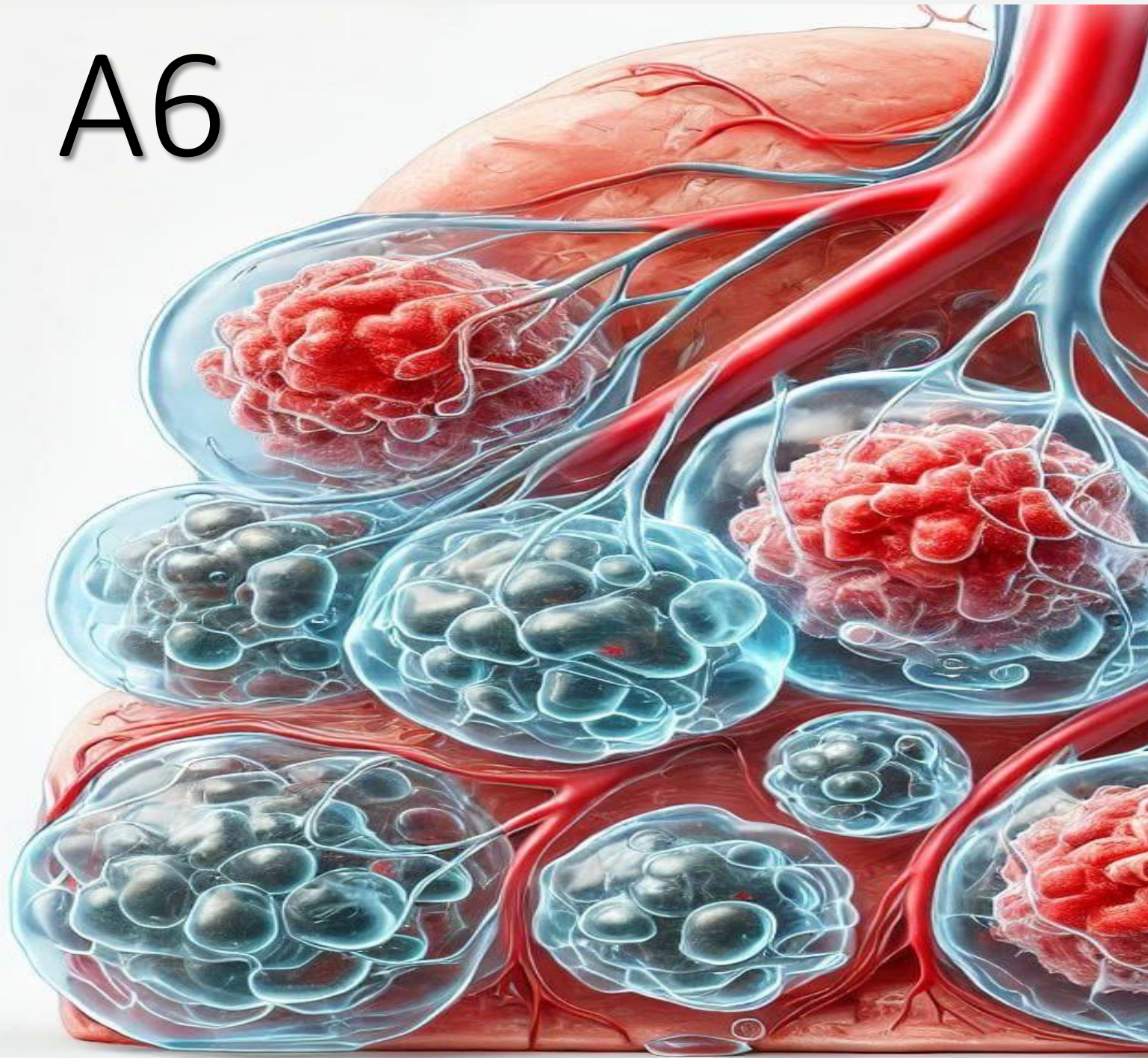


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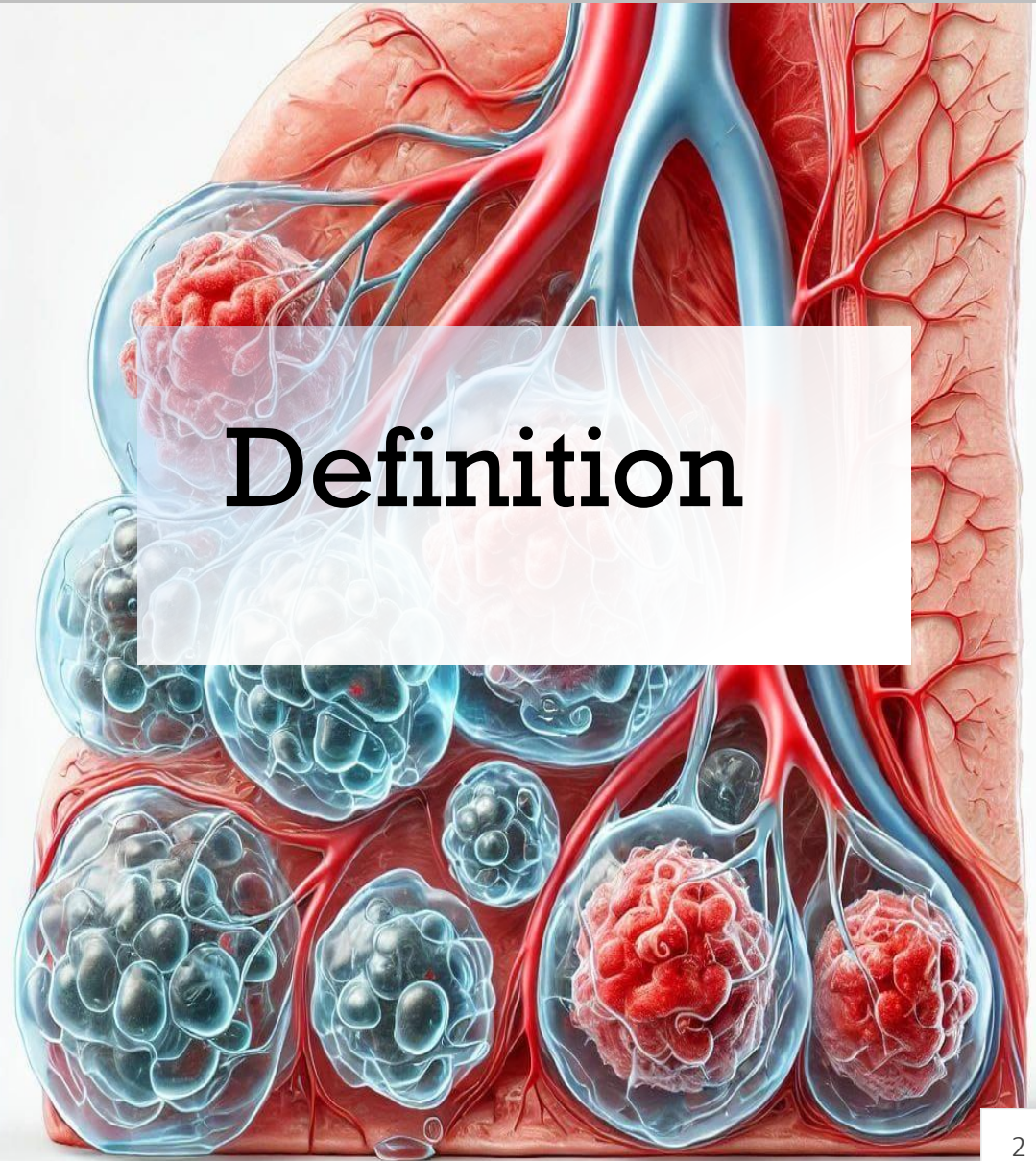
Lymphatic diseases (lymphedema)

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Lymphoedema may be defined as abnormal limb swelling caused by the accumulation of increased amounts of high protein ISF secondary to defective lymphatic drainage in the presence of (near) normal net capillary filtration.



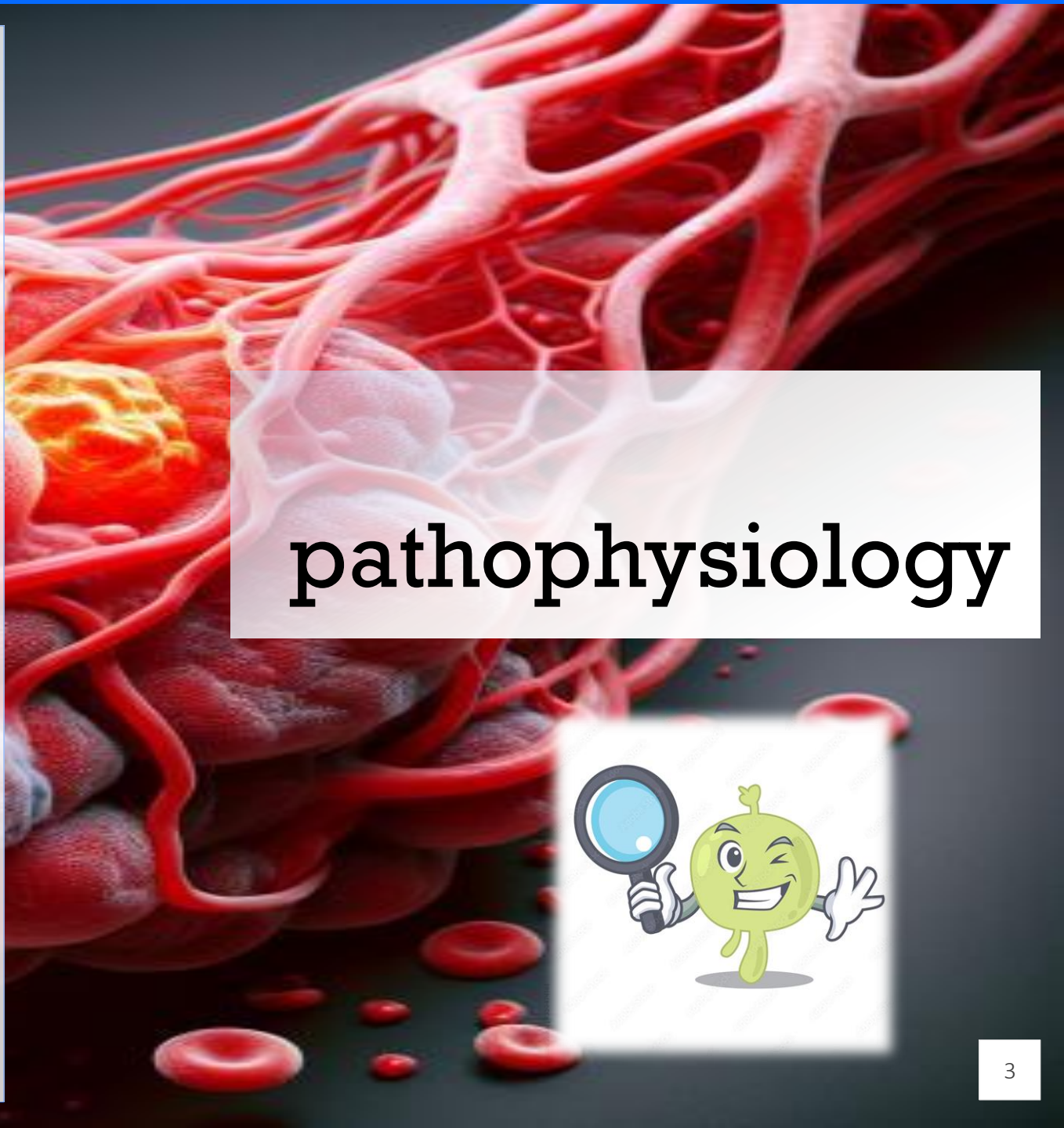
Normally

oxygenated blood gets sent from the heart to your tissues via arteries, which get smaller and smaller until they feed the capillary beds, which then provide nutrients to your cells, as well as pick up waste.

As blood flows through the capillaries, hydrostatic pressure (the pressure exerted by the blood against the capillary walls) is higher at the arterial end, promoting the outward movement of fluid into the surrounding tissues.

By the time blood reaches the venous end of the capillaries, the hydrostatic pressure decreases significantly because the pressure from the heart is lower and some of the fluid has already been filtered out into the interstitial space, but proteins cannot easily pass through the capillary walls, leading to a higher concentration of proteins in the blood compared to the interstitial fluid. This creates an osmotic gradient that draws water back into the capillaries. This process is essential for fluid reabsorption at the venous end, but not all interstitial fluid is reabsorbed back.

The lymphatic system plays a critical role in removing this excess fluid and returning it to the bloodstream.



pathophysiology



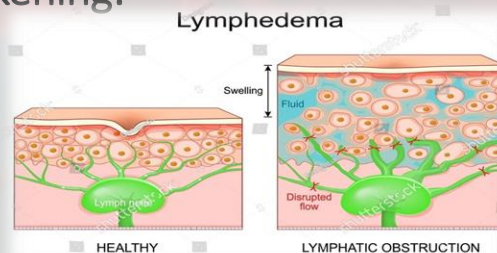
In lymphedema, the primary issue is within the lymphatic system itself, which is damaged or blocked, not the capillaries. Even though capillary fluid filtration is normal, the lymphatic system can't drain the fluid properly, leading to the accumulation of high-protein fluid in the tissues.

In lymphedema, the accumulation of fluid and proteins in the interstitial space leads to further complications beyond swelling ;

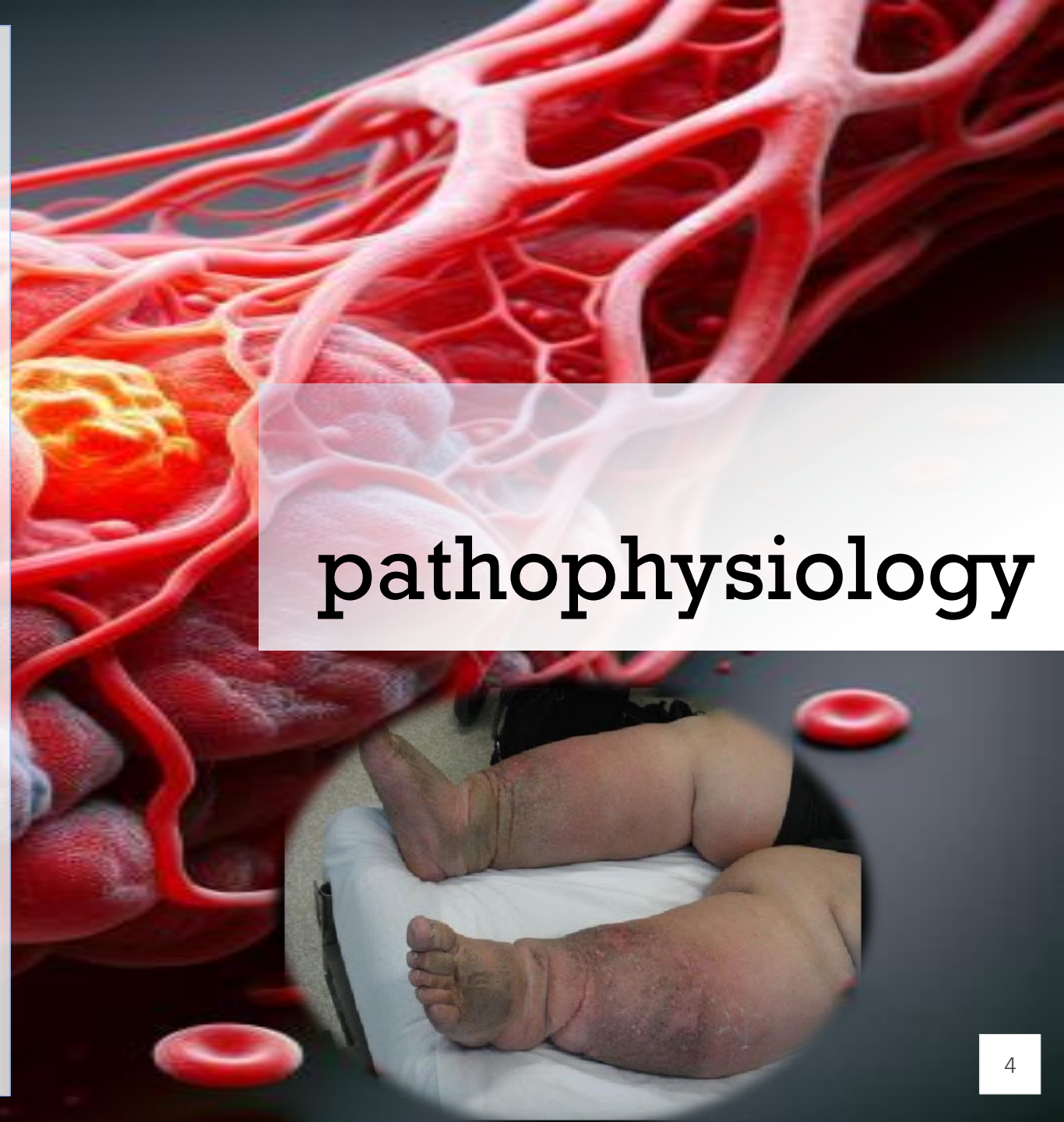
1- The high-protein environment stimulates fibroblasts (cells that produce collagen), leading to the buildup of fibrous tissue → **Subdermal Fibrosis** (making the skin and underlying tissues harder) .

2- Macrophages and lymphocytes (immune cells) accumulate, causing **chronic inflammation**.

3- Keratinocytes Activation: These skin cells become active, contributing to skin changes and thickening → **Dermal Thickening:**



pathophysiology



1- Primary lymphoedema: in which the cause is unknown (or at least uncertain and unproven); it is thought to be caused by 'congenital lymphatic dysplasia'.

2- Secondary lymphoedema: in which there is a clear underlying cause.

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 worm which lives in the lymphatics & L.Ns. of the groin, abdomen and pelvis → lymphatic obstruction

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)



classification

Fedaa Ziyadeh

• Stages of lymphoedema

Stage "0"

- latent

Description

May exist for months or years before showing, no clinically apparent lymphoedema, but maybe tightness or heaviness feeling in skin

Stage'1'

- reversible

reversible pitting edema, Swelling decreases at night and increased during the day

Stage'2'

- irreversible

Irreversible pitting edema, "**positive stemmer's sign**", Fibrosis appearance

Stage'3'

- elephantiasis

Irreversible skin changes (Acanthosis, hyperkeratosis and papillomatosis)



travel	surgery	Radiation
Genetic factor	chronic infection	Obesity
Age	trauma	Hypertension



Risk factors

although the true risk factor is unknown

Signs and symptoms

- **Swelling**
-
- **constant dull ache**
-
- **burning sensation or needles and tightness**
-
- **skin problems and changes**
-
- **immobility so leading obesity and muscle wasting**
-
- **contour of ankle is lost through infilling of submalleolar depression buffalo hump**
-
- **stemmer's sign**
-
- **Square toes**
-
- **in advanced state, fibrosis, hyperkeratosis , warts , chronic eczema and ulceration can occur if chronic venous insufficiency presents ,**



Clinical Approach

Signs and Symptoms



- Characteristically involves the foot
- Initially **pitting edema** and ↓ on limb elevation



- '**Buffalo hump**' on the dorsum of the foot
- Loss of the normal perimalleolar shape, resulting in a "**tree trunk**" pattern



- '**Square toes**'

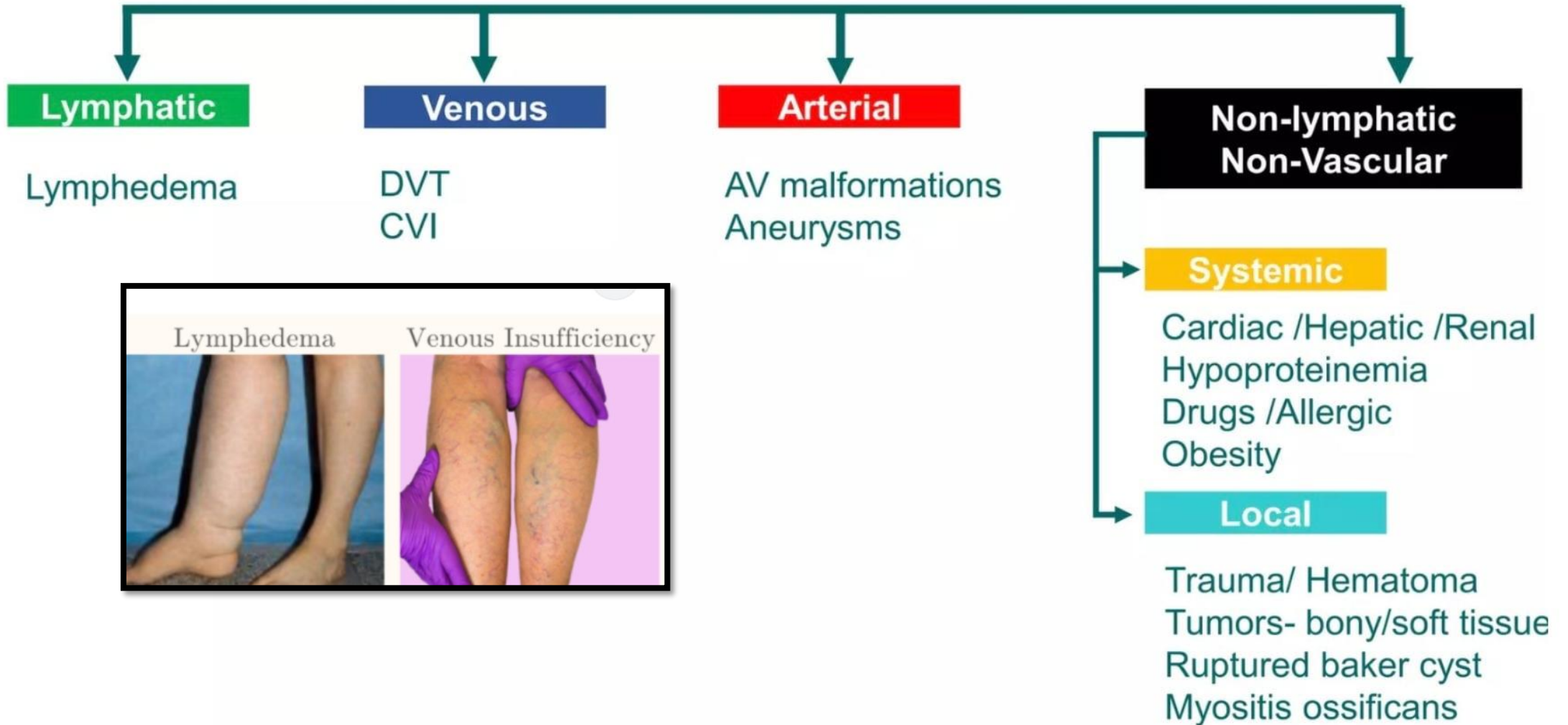


- '**Stemmer's sign**' skin on the dorsum of the toes cannot be pinched because of subcutaneous fibrosis.

Complications

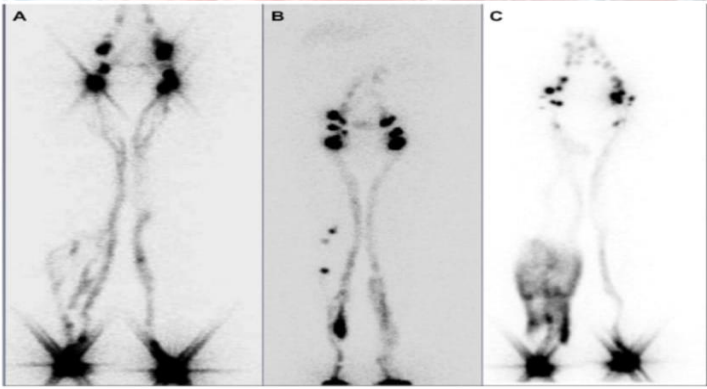
- . **Infections:** proceeds and precipitates the lymphedema
 - Recurrent cellulitis: good substrate and less host immune response
- . **Malnutrition and immunodeficiency:**
 - Especially in lymphangiectasia with protein-losing enteropathy or chylous ascites or chylothorax
- . **Malignancies:**
 - That appear with increased frequency in lymphedematous limbs include
 - Lymphangiosarcoma , **Stewart–Treves'syndrome**
 - Kaposi's sarcoma,
 - Squamous cell carcinoma,
 - Malignant lymphoma, and
 - Melanoma.

Differential Diagnosis of The Swollen Limb



Abed-Alhameed Elayyan

Lymphoscintigraphy → injecting a radio-labelled protein SC and monitoring its movement through lymphatics



1-Magnetic resonance, imaging with contrast

2-Lymph node biopsy-→ to diagnose filariasis and malignancy

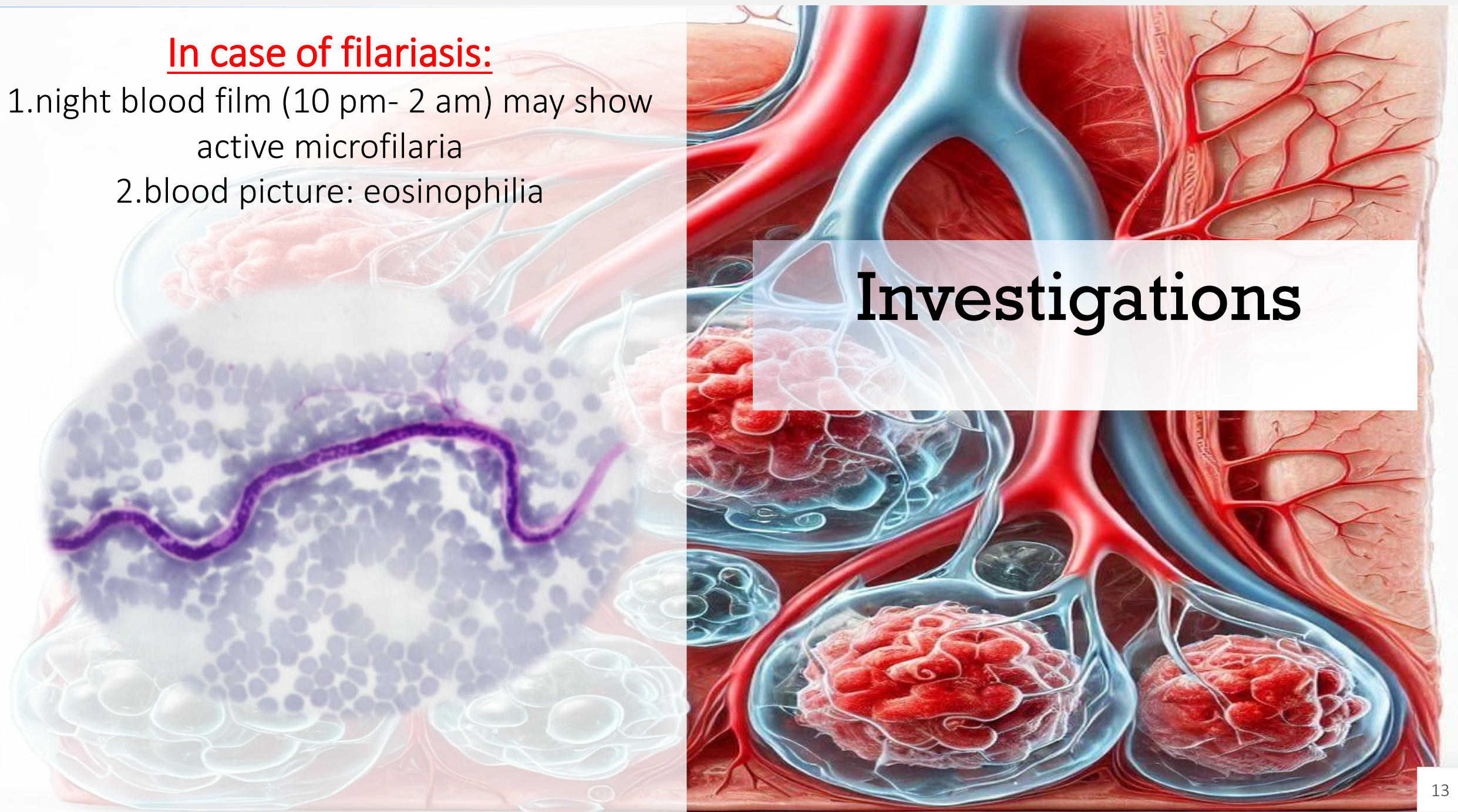
3-Ultrasonography-→ to exclude lipoedema

Investigations

In case of filariasis:

1. night blood film (10 pm- 2 am) may show active microfilaria
2. blood picture: eosinophilia

Investigations



1- Conservative:

- For early mild cases
- * Elevation, exercise, compression stockings (to improve drainage)
- * Diethyl carbamazine (in case of filariasis)
- Antibiotic : in case of lymphangitis and cellulitis (suspected in case of sudden onser leg pain, swelling and erythema)
broad spectrum IV AB is uesd like
pencillins, cephalosporins and
vaoncomycin)

Treatment

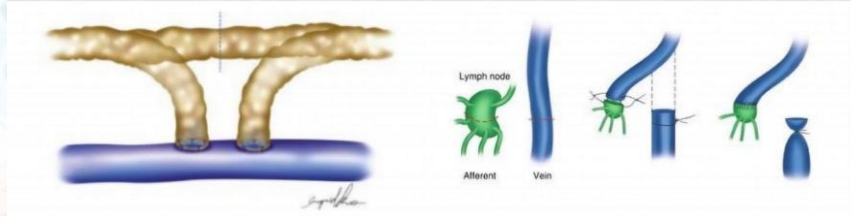
2- Surgery:

Surgical intervention is an alternative approach for patients whose lymphedema has been refractory to nonoperative therapies

A) Physiological operations

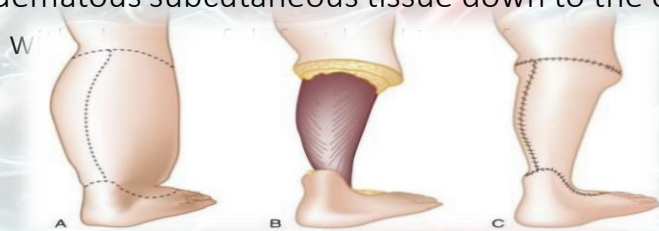
-approach is to provide alternative lymphatic drainage bypassing the obstructions

1. Lymphatico-venous anastomosis → the dilated lymphatics are anastomosed to nearby veins
2. Lympho-venous anastomosis → the distal surface of bisected L.N. are anastomosed
3. Autogenous L.N. transplantation → this could stimulate lymphangiogenesis
4. Closure of disrupted lymphatic channels.



B) Excisional operations

removing all the edematous subcutaneous tissue down to the deep fascia



Treatment



Thank You