

# KELAINAN PEMBULUH LYMPHE

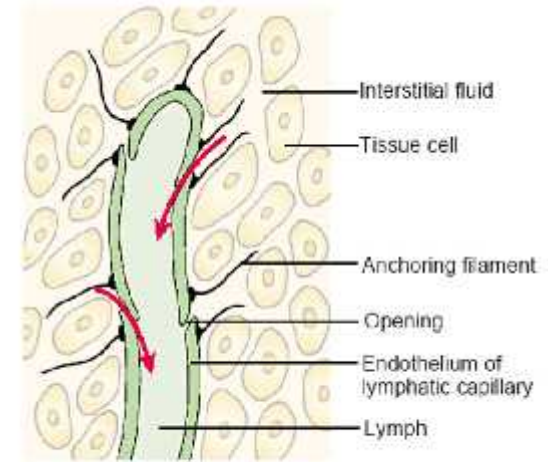
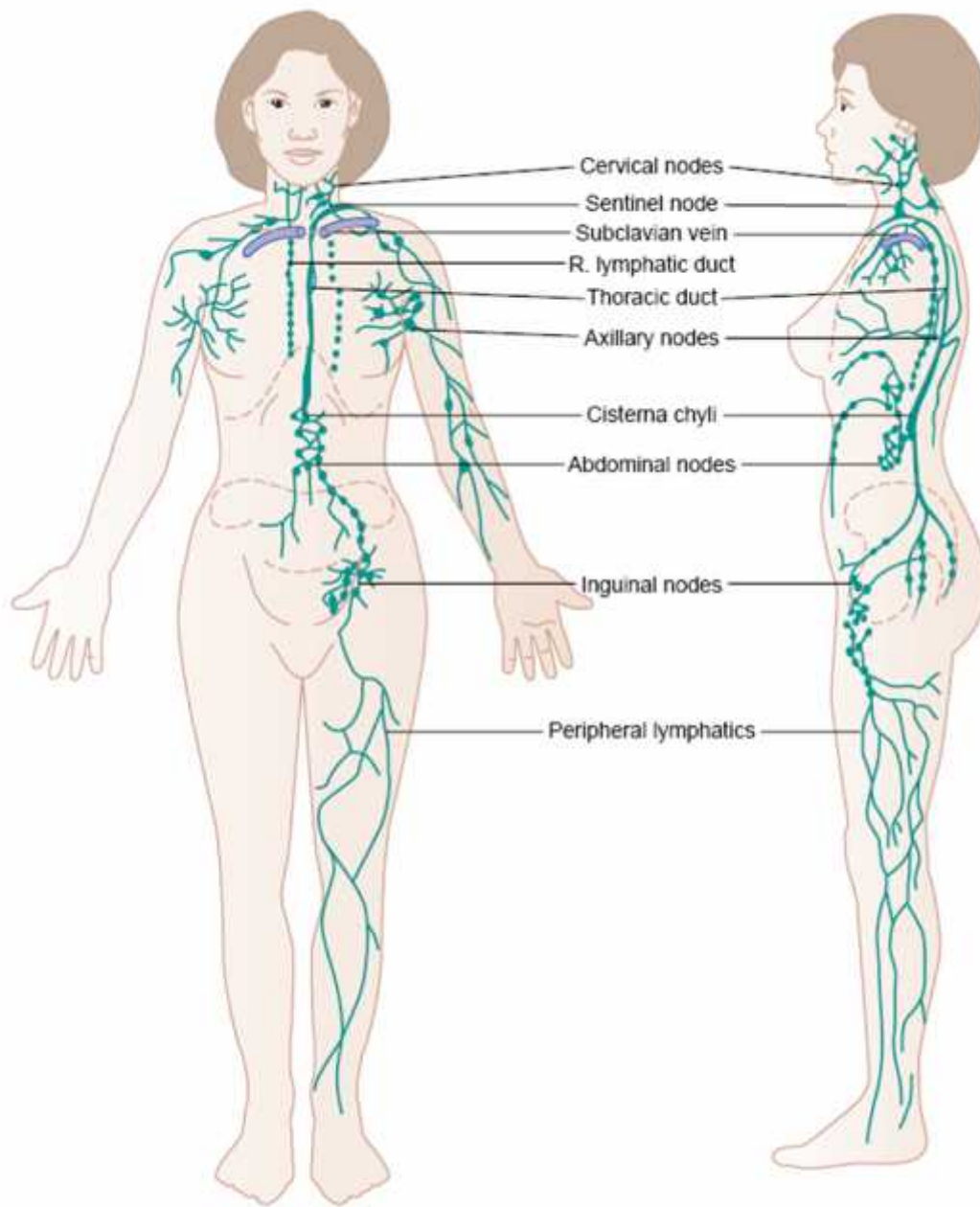
Bambang Sugeng  
Bag Bedah FK-Unissula

# ANATOMI

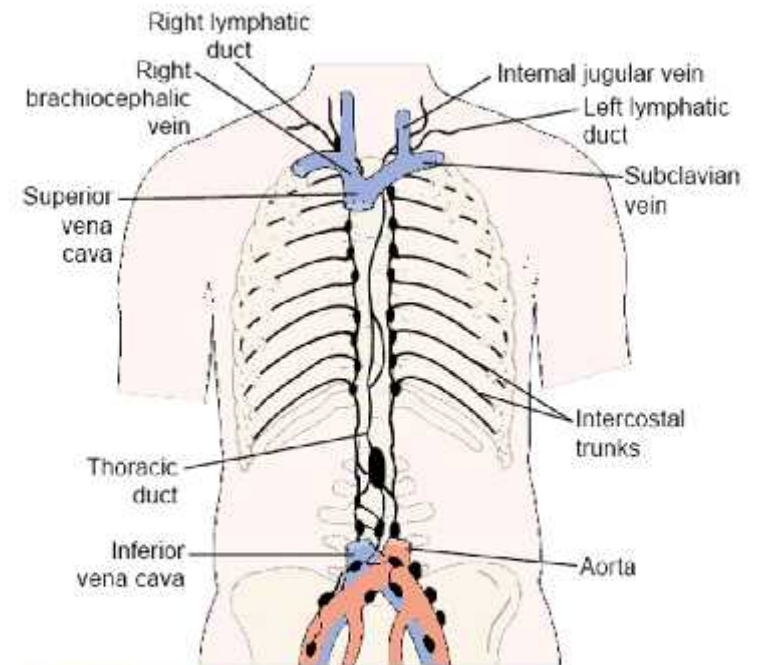
- Sistem limfe terdiri dari :
  - > saluran limfe
  - > organ limfoid ( kel.limfe, lien, Peyer's patch, thymus, tonsil)
  - > sel limfosit
- Saluran limfe saling berhubungan seperti jala
- Membentuk saluran limfe yg lebih besar (sakus limfatikus)

# ANATOMI

- Saluran limfe terdiri dari saluran dangkal dan dalam
- Melalui *cysterna chyli* menuju *ductus thoracicus* → aliran vena
- Aliran limfe mengikuti aliran vena

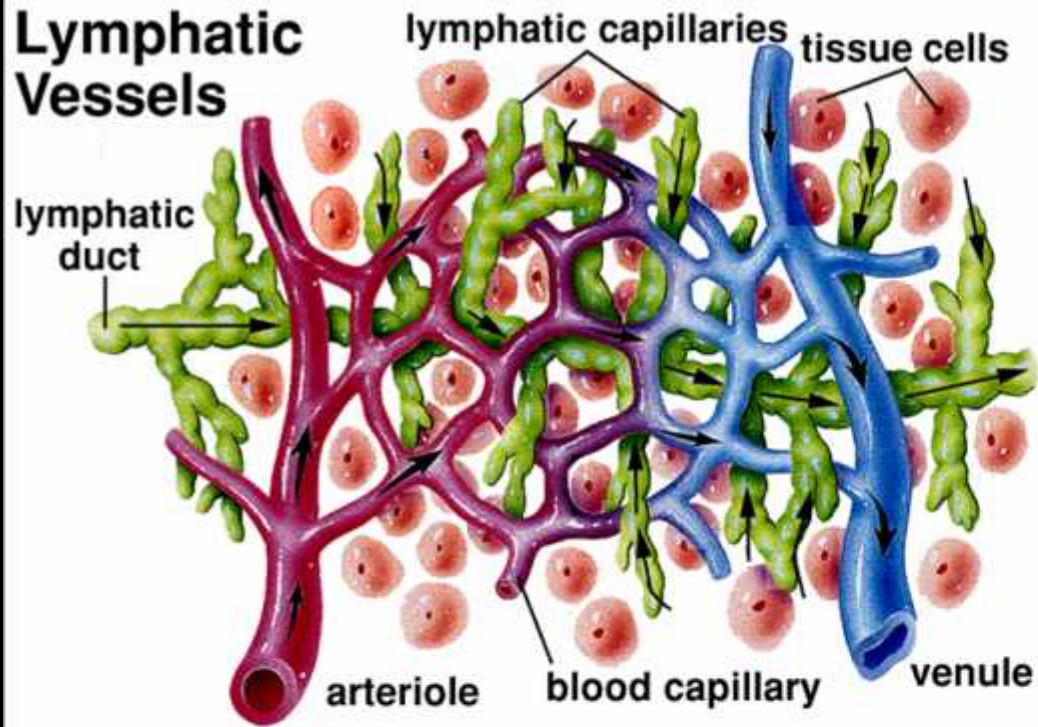


■ FIGURE 14-24 ■ Details of a lymphatic capillary.

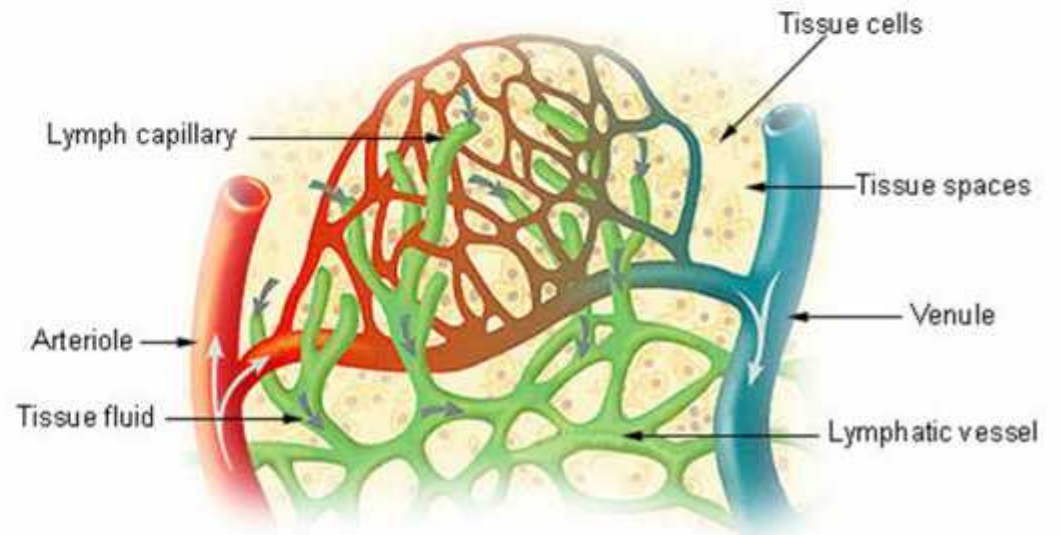


■ FIGURE 14-25 ■ Lymphatic system showing the thoracic duct and position of the left and right lymphatic ducts.

## Lymphatic Vessels



## Lymph Capillaries in the Tissue Spaces



# FISIOLOGI

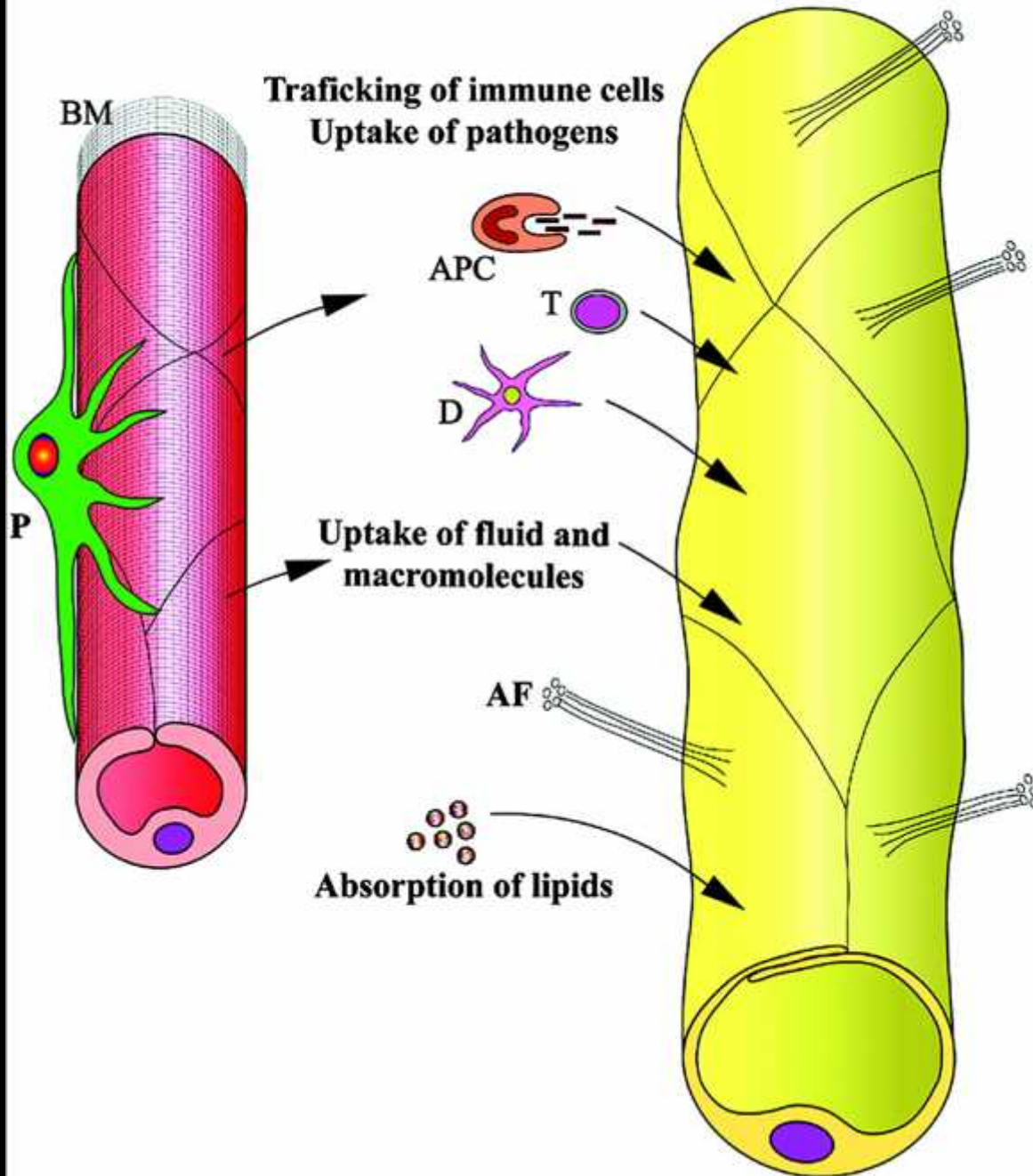
- Pembuluh limfe mengalirkan cairan interstitium melalui mekanisme permeabilitas
- Aliran limfe bertugas :
  - > mengambil air, elektrolit dan zat lain ( polipeptida, sitokin, fibrinogen, albumin dll) kembali ke sirkulasi
  - > mengalirkan limfosit dan sel imun

# FISIOLOGI

- > limfe intestinal (chyle) sbg transport kolesterol, asam lemak rantai panjang, trigliserid, dan vitamin yg larut dlm lemak (A,D,E dan K) langsung ke sirkulasi tanpa melalui hepar
- > kelenjar limfe superfisial merupakan “penyaring” infeksi dan metastasis tumor ganas
- Produksi cairan limfe sehari rata-rata 3 liter

**BLOOD CAPILLARY**

**LYMPHATIC CAPILLARY**





# Kelainan Bawaan

# Lymphangioma

- Yang sering didapati adl Limfangioma kistik = higroma kistik
- Sebagian besar higroma kistik ada pada leher : *Hygroma colli cystica*
- Tempat lain yg sering : aksilla, mediastinum, inguinal
- Pada anak laki = wanita
- Timbul waktu lahir atau neonatus

# ETIOLOGI

- Anyaman pembuluh limfe mengalami dilatasi, saling bersatu membentuk *saccus lymphaticus*
- Bila saluran kearah sentral buntu → penumpukan cairan limfe
- Karena anyaman seperti jala → tumpukan gelembung dari kecil sampai besar

# PATOLOGI

- Gelembung permukaan besar, makin ke dalam makin kecil
- Dilapisi selapis endotel shg sangat tipis
- Gelembung bersatu menjadi tumor yg sangat besar dan menyusup ke dalam otot leher, laring, pharing, mulut dan lidah

# GAMBARAN KLINIS

- Bayi datang dengan benjolan pada leher yg makin besar
- Tidak ada rasa nyeri / keluhan lain shg terlambat dibawa ke rumah sakit
- Benjolan mengakibatkan kepala miring kearah berlawanan
- Mendesak trakhea → sesak napas
- Mulut → gangguan menelan



© Division of Pediatric Surgery - Brown Medical School



# GAMBARAN KLINIS

- Aksilla → menekan pleksus brakhialis
- Palpasi :
  - > letak trigonum posterior
  - > konsistensi kistik
  - > tidak nyeri
  - > bebas dari kulit ttp melekat pd dasar
- Diafanoskopi / transiluminsasi : positif
- Bila infeksi → merah dan nyeri



# PENATALAKSANAAN

- Eksisi seluruh kista
- Sering : pengambilan in toto tidak mungkin karena melekat pd organ penting
- Sisa kista : terapi sklerosan atau dengan antikanker
- Morbiditas dan mortalitas tinggi
- Sering rekurens

# Lymphadenitis

- Pembesaran kelenjar limfe regional akibat infeksi banal. Misal : infeksi kaki menyebabkan pembesaran kel inguinal
- Dapat tanpa limphangitis, misalnya carries dentis menyebabkan pembesaran kel submandibulla
- Meskipun infeksi sudah sembuh, pengecilan kelenjar lambat
- Terapi : antibiotika yg sesuai

- Infeksi spesifik juga menyebabkan lymphadenitis, misalnya tbc dapat menyebabkan lymphadenitis leher
- Lymphadenitis tbc sering **tanpa** disertai tbc paru
- Lymphadenitis leher yg pecah → tukak dan sikatriks yg khas, dsbt skrofuloderma
- Penanganan : biopsi dan tuberkulostatika

# Lymphangitis

- Lymphangitis akut disebabkan oleh *Streptococcus pyogenes* dan *Staphylococcus aureus* yg masuk ke aliran limfe
- Bila tidak ditangani menjadi abses → bakteremi → septikemi
- **Rubor, calor, dolor** dan **functio laesa** pada saluran limfe superfisial
- Saluran limfe merah berakhir pada kelenjar limfe





Source: NEJM



- Diagnosis mudah, karena merupakan diagnosis klinis tanpa pemeriksaan penunjang
- Disertai demam, lesu / maleise dan leukositosis (bila diperiksa)
- Penanganan :
  - > mengistirahatkan dan meninggikan ekstremitas
  - > antibiotika yg sesuai dan analgetika
  - > nanah : insisi dan penyaliran nanah



# Lymphedema

- Limfedema = pembengkakan ekstremitas akibat penumpukan protein di cairan interstisial akibat gangguan aliran limfe
- Diderita oleh 2% penduduk, namun jarang yg ke rumah sakit
- Sebab : keluhan minimal dan dokter sering meremehkan dan tidak memberikan solusi
- Pada wanita : sangat berarti

**Table 17.1** Aetiological classification of lymphoedema

---

Primary lymphoedema	Congenital (onset < 1 year old) – sporadic
	Congenital (onset < 1 year old) – familial – (Milroy's disease*)
	Praecox (onset 1–35 years of age) – sporadic
	Praecox (onset 1–35 years of age) – familial (Meige's disease*)
	Tarda (onset after 35 years of age)
Secondary lymphoedema	Bacterial infection
	Parasitic infection (filariasis)
	Fungal infection (tinea pedis)
	Exposure to foreign body material (silica particles)
	Primary lymphatic malignancy
	Metastatic spread to lymph nodes
	Radiotherapy to lymph nodes
	Surgical excision of lymph nodes
	Trauma (particularly degloving injuries)
Superficial thrombophlebitis	
Deep venous thrombosis	

---

\*These terms are used variably.

<b>Lymphedema primer</b>	<b>Lymphedema sekunder</b>
Kongenital (onset < 2 thn)	Infeksi parasit cacing/filaria
Praecox (onset 2 – 35 thn)	Infeksi jamur
Tarda (> 35 thn)	Terpapar benda asing/silica
	Keganasan primer limfe
	Metastasis
	Radioterapi
	Tindakan bedah
	Trauma
	Thrombophlebitis
	Deep Vein Thrombosis

# PATOFISIOLOGI

- Gangguan aliran limfe → penumpukan protein, peptide, air → bengkak
- Produksi fibroblast berlebihan → inflamasi → aktivasi keratinosit
- Hasil akhirnya : penumpukan cairan kaya protein, fibrosis subdermal dan penebalan kulit

# GEJALA KLINIS

- Gejala lokal

- > pembengkakan limfedema tungkai dan kaki
- > awalnya hilang bila istirahat tiduran/ditinggikan
- > bila ditekan tidak kembali (pitting edema)
- > tonjolan malleolus hilang (buffalo hump)
- > besar sekali spt kaki gajah : elephantiasis
- > kulit bergaris menebal, tidak dpt dipegang pinset krn fibrosis (Stemmer's sign)





**Table 17.2** Clinical classification of lymphoedema (Brunner)

---

<i>Grade</i>	<i>Clinical features</i>
Subclinical (latent)	There is excess interstitial fluid and histological abnormalities in lymphatics and lymph nodes but no clinically apparent lymphoedema
I	Oedema pits on pressure and swelling largely or completely disappears on elevation and bed rest
II	Oedema does not pit and does not significantly reduce upon elevation
III	Oedema is associated with irreversible skin changes: fibrosis, papillae

---



**Fig. 17.10** Elephantiasis due to filariasis. (Photograph reproduced with permission from Mr R. Kaje, Jipher, India.)



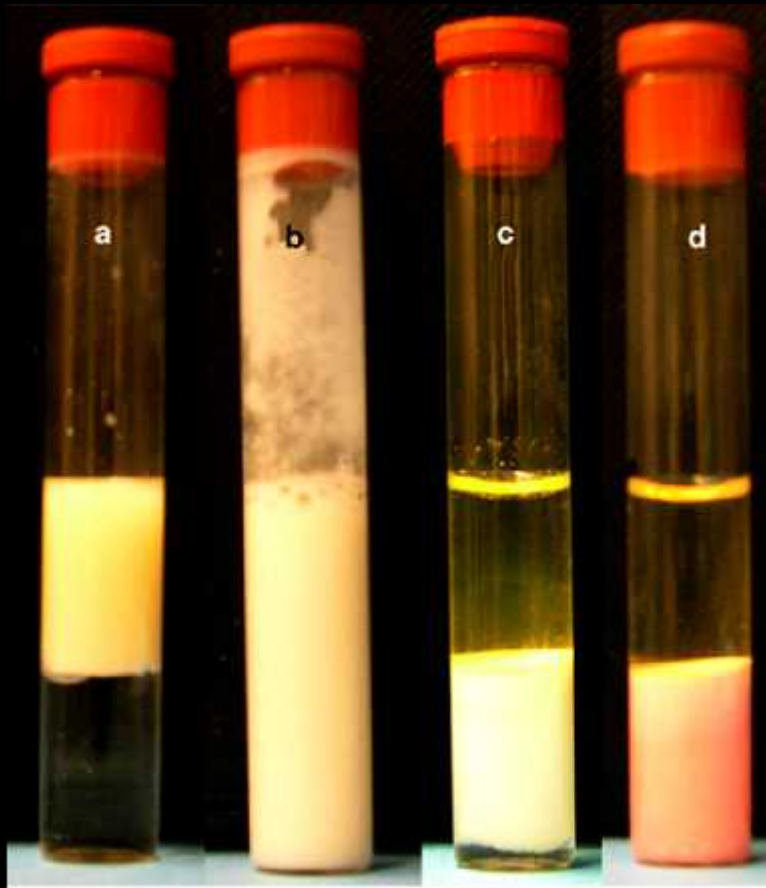
# GEJALA KLINIS

- Gejala lokal
  - > infeksi kuku kronis seperti jamur
  - > nyeri tumpul spt ditusuk jarum
- Gejala sistemik
  - > maleise
  - > demam, sakit kepala
  - > pada filaria didpt chyluria yg dapat mengganggu ginjal



**Fig. 17.2** The foot of a patient with typical lymphoedema.





Chyluria

# PEMERIKSAAN PENUNJANG

- Sebagian besar diagnosis tdk memerlukan pemeriksaan penunjang
- Bila diperlukan tindakan operatif, pemeriksaan penunjang:
  - > lymphangiography
  - > USG, lymphoscintigraphy isotope, CT-scan, MRI
  - > filaria : menemukan cacing dalam darah





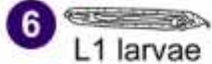
*Wucheria bancrofti* in blood  
WHO/TDR/Stammers

# Filariasis

(*Wuchereria bancrofti*)

## Mosquito Stages

8 Migrate to head and mosquito's proboscis

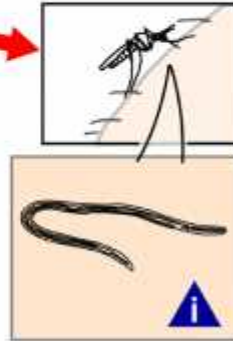


5 Microfilariae shed sheaths, penetrate mosquito's midgut, and migrate to thoracic muscles

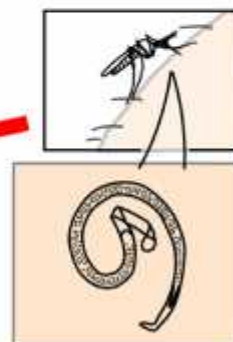
**i** = Infective Stage

**d** = Diagnostic Stage

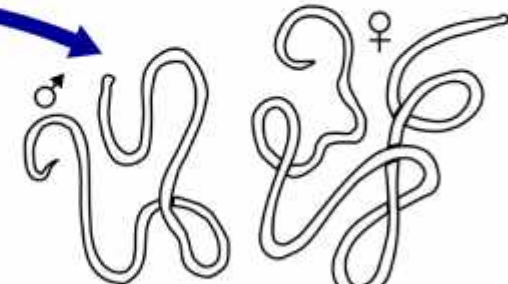
1 Mosquito takes a blood meal (L3 larvae enter skin)



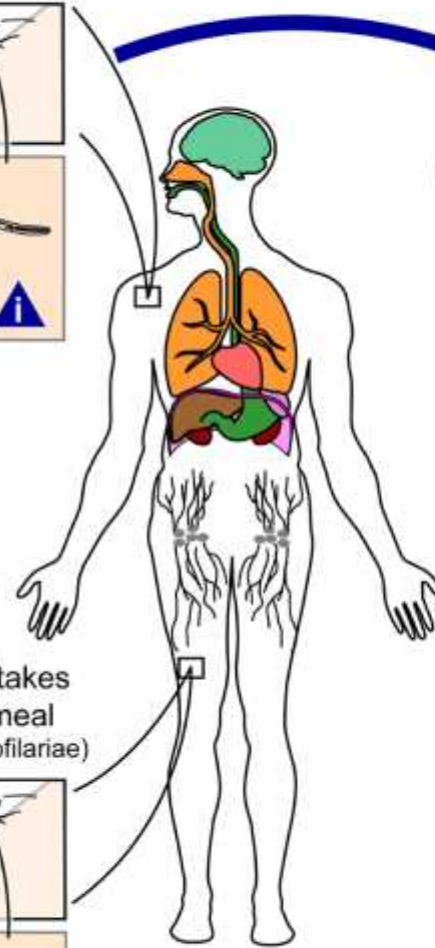
4 Mosquito takes a blood meal (ingests microfilariae)



## Human Stages



3 Adults produce sheathed microfilariae that migrate into lymph and blood channels




























	Normal	Congenital hyperplasia	Distal obliteration (hypo/aplasia)	Proximal obliteration (hypo/aplasia) with distal hyperplasia	Proximal obliteration (hypo/aplasia) with distal obliteration
Thoracic duct					
Nodes					
Para-aortic					
Iliac					
Femoral					



fig. 17.12 Obstructive lymphoedema of the left arm secondary to adical mastectomy and radiotherapy for breast carcinoma.

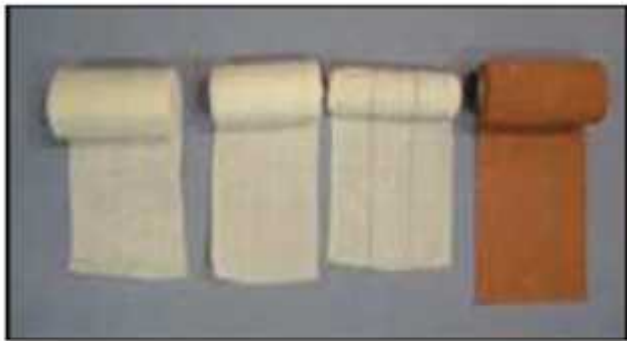
## Lymphangiography

# PENATALAKSANAAN

1. Penanganan nyeri : dicari penyebab nyeri dan ditangani
2. Edema : istirahat, ekstremitas ditinggikan, masase dan latihan gerakan
3. Perawatan kulit : jaga kebersihan, jaga kelembaban, konsult dokter kulit
4. Fisioterapi : dengan *manual lymphatic drainage*

# PENATALAKSANAAN

5. Kompresi spt pada varices, berjenjang dan berlapis : *multilayer lymphoedema bandage = MLLB*
6. Latihan berenang utk menggerakkan otot → memompa limfe. Hindari latihan isometrik
7. Obat-obatan (?)
8. Pembedahan (operasi Thompson, Homan)



Left: Components of four layer bandage system. Right: Four layer bandage system to treat venous ulcer (note class II compression stocking on right leg for prevention of ulceration)

### Single layer compression bandages

Class (level of compression)	Indication	Examples
3a (light (14-17 mm Hg))	To treat simple VLU	Elset, Litepress
3b (moderate (18-24 mm Hg))	To treat VLU and ulcers secondary to lymphoedema	Tensoplus Forte, Coban
3c (high (25-35 mm Hg))	As for class 3b plus gross varicose veins in moderate sized legs	Tensopres, Setopress, Surepress
3d (extra-high (36-50 mm Hg))	To treat extensive VLU, ulcers secondary to lymphoedema, extensive varicose veins, and post-thrombotic venous insufficiency in patients with very large and oedematous legs	Elastic web bandages (blue line or red line webbing)

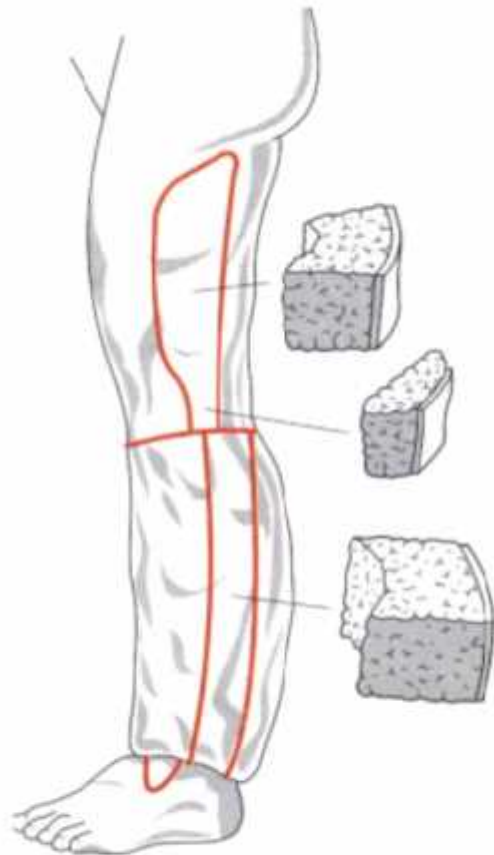
VLU = venous leg ulcer.



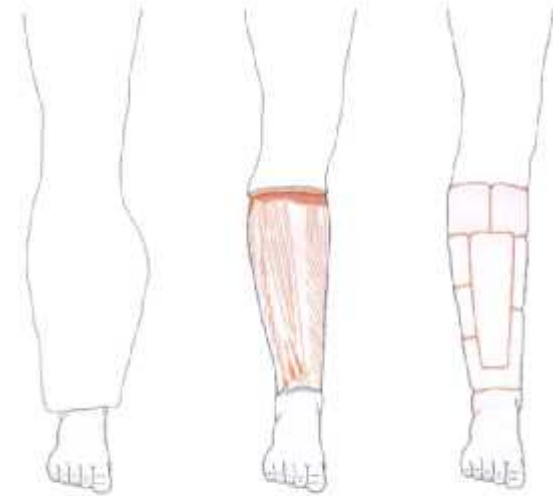
Top left: Single layer elastic compression bandage. Top right: Inelastic (short stretch) compression bandage. Left: Three layer elasticated tubular bandage

**Table 17.3** Differential diagnosis of the swollen limb

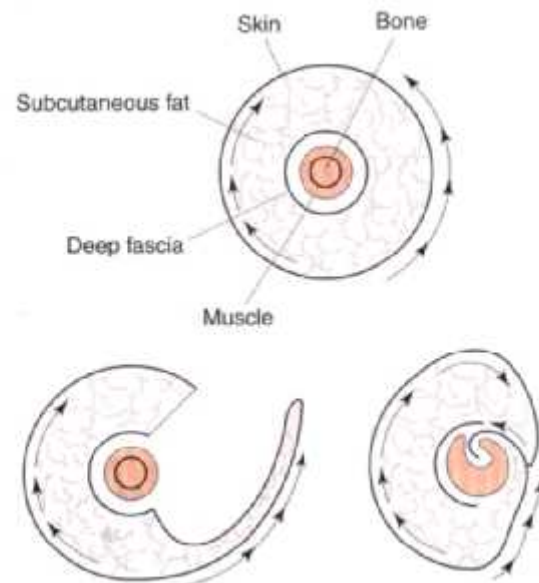
Nonvascular or lymphatic	General disease states	Cardiac failure from any cause. Liver failure. Hypoproteinaemia due to nephrotic syndrome, malabsorption, protein losing enteropathy. Hyperthyroidism (myxoedema). Allergic disorders including angioedema and idiopathic cyclic oedema. Prolonged immobility and lower limb dependency
	Local disease processes	Ruptured Baker's cyst. Myositis ossificans. Bony or soft tissue tumours. Arthritis. Haemarthrosis. Calf muscle haematoma. Achilles tendon rupture
	Retroperitoneal fibrosis	May lead to arterial, venous and lymphatic abnormalities
	Gigantism	Rare. All tissues are uniformly enlarged
	Drugs	Corticosteroids, oestrogens, progestagens; monoamine oxidase inhibitors; phenylbutazone; methyldopa; hydralazine; nifedipine
	Trauma	Painful swelling due to reflex sympathetic dystrophy
Venous	Obesity	Lipodystrophy, lipoidosis
	Deep venous thrombosis	There may be an obvious predisposing factor such as recent surgery. The classical signs of pain and redness may be absent
	Post-thrombotic syndrome	Swelling, usually of the whole leg, due to iliofemoral venous obstruction. Venous skin changes, secondary varicose veins on the leg and collateral veins on the lower abdominal wall. Venous claudication may be present
	Varicose veins Rippel-Trenaunay syndrome and other malformations	Simple primary varicose veins are not usually associated with significant leg swelling Rare. Present at birth or develops in early childhood. Comprises an abnormal lateral venous complex, capillary naevus, bony abnormalities, hypo(a)plasia of deep veins and limb lengthening. Lymphatic abnormalities often coexist
Arterial	External venous compression	Pelvic or abdominal tumour including the gravid uterus. Retroperitoneal fibrosis
	Ischaemia reperfusion	Following lower limb revascularisation for acute and chronic ischaemia
	Arteriovenous malformation	May be associated with local or generalised swelling
	Aneurysm	Popliteal. Femoral. False aneurysm following (iatrogenic) trauma



**Fig. 17.14** Homan's procedure involves raising skin flaps to allow the excision of a wedge of skin and a larger volume of subcutaneous tissue down to the deep fascia. Surgery to the medial and lateral aspects of the leg must be separated by at least 6 months to avoid skin flap necrosis.



**Fig. 17.17** Charles' procedure involves circumferential excision of lymphoedematous tissue down to and including the deep fascia followed by split skin grafting. This procedure gives a very poor cosmetic result but does allow the surgeon to remove very large amounts of tissue and is particularly useful in patients with severe skin changes.



**Fig. 17.16** A cross-sectional representation of Thompson's reduction operation; the buried dermal flap.



