



NOTES

LYMPHATIC DYSFUNCTION

LYMPHEDEMA

osms.it/lymphedema

PATHOLOGY & CAUSES

- Lymphatic system becomes obstructed, causing **protein-rich fluid buildup in tissues**
- When flow is blocked, lymph gets backed up → **drainage stops** → **fluid accumulates**
- **Inflammatory reaction**: macrophages release inflammatory molecules → damages nearby cells → scarring, fibrosis (connective tissues thicken/scar tissue forms) → hardening

CAUSES

- **Filariasis**: **most common** cause in **low-income countries**
 - Infection with **nematode parasites** (e.g. *Wuchereria bancrofti*)
 - Nematode enters lymphatic system, causes fibrosis, creates a blockage
- **Cancer, associated treatment**: **most common cause in high-income countries**
 - **Removal of lymph nodes** most common cancer treatment-related cause (e.g. axillary lymph nodes removed during mastectomy)
- **Lymphedema praecox/primary lymphedema**: congenital, results from lymphatic system not developing correctly < 35 years old
- **Lymphedema tarda/primary lymphedema**: > 35 years old, associated with genetic disorders (e.g. Turner syndrome)

RISK FACTORS

- Older age, obesity, rheumatoid/psoriatic arthritis, **Turner syndrome**, smoking, cancer/associated treatment (esp. breast cancer)



Figure 13.1 Gross lymphedema of the left leg.

STAGING

- **Stage 0**: latent stage. Damage to lymphatics but enough lymph still removed. Lymphedema not present
- **Stage 1**: spontaneously reversible. Tissue in pitting stage. Affected area normal/almost normal size in morning, progressively worsens throughout day
- **Stage 2**: spontaneously irreversible. Tissue spongy, non-pitting (bounces back when pressed). Fibrosis starts to develop → limbs harden, increase in size
- **Stage 3**: lymphostatic elephantiasis. Swelling irreversible, limbs large, hard from fibrosis

COMPLICATIONS

- Recurrent cellulitis, limb swelling (esp. lower limbs), erythema, pain

SIGNS & SYMPTOMS

- Chronic swelling, one limb larger than other
- Usually lower limbs; impairs movement
- Fatigue, fever, chills, weakness
- More likely to occur with superimposed bacterial/fungal skin infection
- **Regional edema:** begins as soft, pitting edema → progresses into chronic fibrosis without treatment

DIAGNOSIS

DIAGNOSTIC IMAGING

Lymphoscintigraphy

- Nuclear imaging to assess lymphatic flow
 - Radiotracer injected into affected limb → able to visualize dermal backflow, absent/delayed radiotracer movement, absent/delayed lymph node visualization

MRI

- Shows severity, distribution of edema, lymphatic channels can be depicted after intracutaneous contrast injection

MR venogram

- Helps differentiate lymphatic channels from superficial veins

CT scan

- Assists in localization (subfascial, epifascial), characteristics (skin thickening, honeycomb pattern of edema)

Ultrasound

- May be used to reveal blockages

TREATMENT

- No cure, no medication
- Depends on severity, limb fibrosis

SURGERY

- Goal: improve drainage/reduce fluid load

OTHER INTERVENTIONS

- Therapeutic exercises, self care
- **Kinesio tape:** applied to skin to channel lymph, reduce swelling
- Aquatic therapy

Manual lymphatic drainage (MLD)

- **Pneumatic pumps:** substitute for MLD

Compression

- **Multilayer compression bandage:** stop fluid accumulation
- Compression massages help lymph flow
- Compression garments

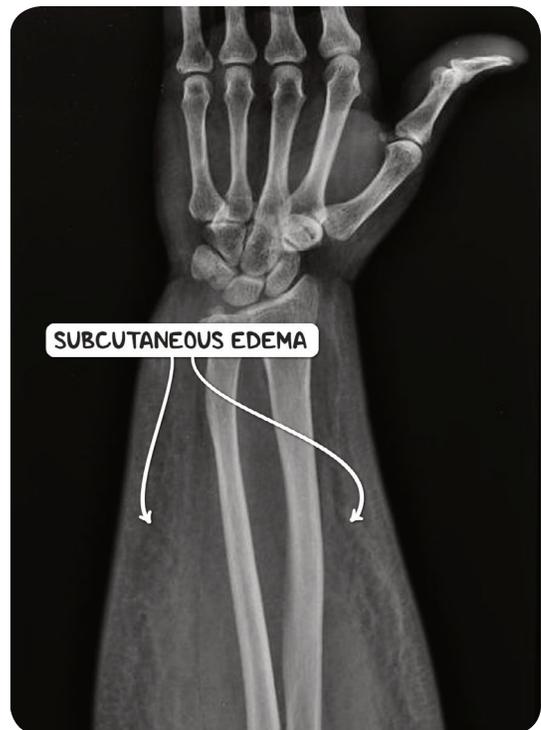


Figure 13.2 A plain X-ray of the forearm showing edema of the subcutaneous tissues. The subcutaneous fat shows characteristic streaky densities.