Finger clubbing: Causes, Grading and Schamroth's sign

Finger clubbing is a painless deformity characterized by proliferation of connective tissue on the dorsal aspect of the distal fingers or toes, leading to bulbous enlargement of the terminal phalanges and changes in the nail bed curvature.

Pathophysiology

Clubbing develops over weeks to months and is usually bilateral and symmetrical. It results from increased blood flow to the distal phalanges via dilated vessels and formation of multiple arteriovenous shunts. Platelet-derived growth factors released from megakaryocytes trapped in the digital circulation stimulate connective tissue proliferation.

This increased vascularity and tissue proliferation cause soft tissue swelling, increased nail curvature (convexity), and obliteration of the normal diamond-shaped gap between opposed nails.

Clinical Associations

Commonly associated conditions include:

- **Pulmonary diseases:**
  - Interstitial lung disease
  - Lung infections (e.g., lung abscess, empyema)
  - Lung cancer (primary and metastatic)
  - Bronchiectasis
  - Cystic fibrosis
  - Mesothelioma
- **Cardiovascular causes with chronic hypoxia:**
  - Congenital heart diseases (especially cyanotic types)
  - Arteriovenous malformations/shunts (including dialysis fistulas)
  - Infective endocarditis
  - Aneurysms
- **Other systemic causes:**
  - Liver cirrhosis
  - Inflammatory bowel disease
  - Celiac disease
  - Thyrotoxicosis with thyroid acropachy (clubbing often on radial side of hands)

Note: Unilateral clubbing is rare but may occur in proximal vascular abnormalities like arteriovenous shunts.

Clinical Features

- Bulbous enlargement of the distal fingers or toes
- Soft, spongy swelling at the nail base (increased tissue sponginess)
- Increased convexity of the nail plate and nail bed

- Painless with no significant inflammation

Examination

Steps to assess clubbing:

1. **Visual inspection:**
   Look for the bulbous distal fingers and nail changes from the side.
2. **Schamroth's window test:**
   Place the dorsal surfaces of corresponding fingers from opposite hands together and look for the diamond-shaped gap between the nail beds (Schamroth's window).
   - **Normal:** Diamond-shaped window present
   - **Clubbing:** Window obliterated (positive Schamroth's sign)
3. **Lovibond's angle:**
   The angle between the nail plate and the proximal nail fold is normally < 165°. Clubbing increases this angle to >190°.
4. **Interphalangeal depth ratio:**
   Measure the anteroposterior diameter at the distal interphalangeal joint (B) and at the nail bed (A).
   - Normal: B/A ? 1
   - Clubbing: B/A > 1
5. **Fluctuation test:**
   Place thumbs under distal phalanges and feel with index fingers for movement of the nail on the nail bed, indicating soft tissue swelling.

Stages of Finger Clubbing

Grade	Description
Grade I (Mild clubbing)	Obliteration of Lovibond angle (<165°), positive fluctuation test, Schamroth's window obliterated but clubbing not obvious visually.
Grade II (Moderate clubbing)	Apparent convexity with "parrot beak" nail fold appearance, noticeable on inspection.
Grade III (Gross clubbing)	Thickening of entire distal finger with "drumstick" appearance.
Grade IV (Hypertrophic osteoarthropathy)	Shiny nail and skin with striation; associated with subperiosteal new bone formation causing arthritis-like symptoms in long bones. Common in lung cancer, mesothelioma, bronchiectasis, liver cirrhosis.

Reversibility

Clubbing may regress if the underlying cause is treated effectively, such as after lung transplantation for cystic fibrosis.