Clubbing

Synonyms: Hippocratic nails, Hippocratic fingers (first described by Hippocrates)

This describes an increase in the soft tissue around the end of the fingers and toes. The swelling is painless and usually bilateral, unless a localised vascular abnormality exists. There is no change to the underlying bone. The nail base eventually becomes convex and extends halfway up the nail.

Clubbing is thought to result from changes to the volume of interstitial fluid and increased blood flow to the area but the exact pathophysiology remains unknown.

Primary clubbing may be idiopathic or be a feature of an inherited condition. Secondary clubbing may be caused by a wide range of diseases.
Aetiology

### Causes of Clubbing

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<th>Primary</th>
<th>Pulmonary disease</th>
<th>Cardiac disease</th>
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<td>Pachydermoperiostosis (also known as primary hypertrophic osteoarthropathy).</td>
<td>Lung cancer.</td>
<td>Cyanotic congenital heart disease.</td>
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<tr>
<td>Familial clubbing.</td>
<td>Tuberculosis.</td>
<td>Other causes of right-to-left shunting.</td>
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<td>Hypertrophic osteoarthropathy (a syndrome which also includes chronic proliferative periostitis of the long bones and joint swelling).</td>
<td>Bronchiectasis.</td>
<td>Bacterial endocarditis.</td>
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<th>Gastrointestinal disease</th>
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<td>Cirrhosis of the liver.</td>
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<td>Disseminated chronic myeloid leukemia (POEMS syndrome - polyneuropathy, organomegaly, endocrinopathy, monoclonal gammopathy and skin changes).</td>
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<td>Leiomyoma of the oesophagus.</td>
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<td>Achalasia.</td>
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<td>Peptic ulceration of the oesophagus.</td>
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<td>Pregnancy.</td>
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### Pulmonary Disease
- Lung cancer.
- Tuberculosis.
- Bronchiectasis.
- Cystic fibrosis.
- Interstitial lung disease.
- Idiopathic pulmonary fibrosis.
- Sarcoidosis.
- Lipoid pneumonia.
- Emphyema.
- Pleural mesothelioma.
- Pulmonary artery sarcoma.
- Cryptogenic fibrosing alveolitis.
- Pulmonary metastases.

### Cardiac Disease
- Cyanotic congenital heart disease.
- Other causes of right-to-left shunting.
- Bacterial endocarditis.

### Gastrointestinal Disease
- Ulcerative colitis.
- Crohn's disease.
- Primary biliary cirrhosis.
- Cirrhosis of the liver.
- Leiomyoma of the oesophagus.
- Achalasia.
- Peptic ulceration of the oesophagus.

### Skin Disease
- Bureau-Barré-Thomas syndrome (digital clubbing associated with palmoplantar keratoderma).
- Fischer's syndrome (keratosis palmaris et plantaris, hair hypoplasia, onycholysis and onychogryphosis).
- Palmoplantar keratoderma (diffuse patches on the palms and soles).

### Malignancies
- Thyroid cancer.
- Thymus cancer.
- Hodgkin's disease.
- Disseminated chronic myeloid leukemia (POEMS syndrome - polyneuropathy, organomegaly, endocrinopathy, monoclonal gammopathy and skin changes).

### Miscellaneous Conditions
- Acromegaly.
- Thyroid acropachy (clubbing associated with Graves’ disease and periosteal new bone formation).
- Pregnancy.

### Epidemiology
Pachydermoperiostosis is rare and is characterised by skin thickening of the forehead, eyelids and hands, digital clubbing and periostosis. The epidemiology of secondary clubbing depends on the cause.
The patient may notice a swelling of the distal portion of the fingers or toes but the onset is usually so gradual as to make this a rare occurrence. Even more rarely, the patient may notice some discomfort, because most clubbing is painless. The majority of clubbing is detected by doctors as part of a routine examination for other presenting symptoms.

Clubbing has been described as a bulbous fusiform enlargement of the distal portion of a digit. It is commonly bilateral but may be unilateral and can affect a single digit. Both fingers and toes can be affected.

As clubbing progresses, the angle between the nail and the nail base (called the Lovibond angle) becomes obliterated. Normally, the angle is less than or equal to 160°. With increasing convexity of the nail, the angle becomes greater than 180°. In early clubbing, the nail may feel springy instead of firm when palpated and the skin at the base of the nail may become smooth and shiny.

In individuals without clubbing, if two opposing fingers are placed together, a diamond-shaped window will appear. In clubbing, this window is obliterated and the distal angle formed by the two nails becomes wider. This is known as Schamroth's window test.

**Differential diagnosis**

Pseudo-clubbing - this is overcurvature of the nails in both the longitudinal and transverse axes, with preservation of a normal Lovibond angle. The main features of pseudo-clubbing seen in one study were asymmetrical finger involvement and acro-osteolysis. Whilst these were present in the majority of cases they were also present in some cases of clubbing, so could not be said to be pathognomonic. Pseudo-clubbing may be seen in chronic kidney disease, hyperparathyroidism, sarcoidosis, scleroderma, subungual haematoma and chromosome deletion.

**Investigations**

**Laboratory investigations**
These will depend on the underlying conditions suggested by the overall clinical picture.

**Imaging**
This is not usually required to diagnose clubbing but plain radiographs of the digits may help to elucidate the cause. Osteolysis is often seen in patients with congenital cyanotic heart disease, whilst bone hypertrophy suggests a pulmonary condition.

Other modalities sometimes employed in clinical and research settings include technetium-99m scanning to assess bone loss, thermography and positron emission tomography (PET) scanning.

CT and MRI scanning of other areas may be required to assist in diagnosing the underlying primary cause.

**Management**
This will be dictated by the underlying disease process.
Prognosis
Clubbing is potentially reversible if the underlying condition is treated early enough but the changes may be irreversible once collagen deposition has set in.

Further reading & references
- Clubbing: DermNet NZ


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