

# Clubfoot (congenital talipes equinovarus)

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## Learning objectives

1. Will be able to identify a clubfoot.
2. Will be able to differentiate a true clubfoot from a positional foot deformity.
3. Know the basic management principles of a clubfoot.

## Introduction

Clubfoot (congenital talipes equinovarus) is an idiopathic deformity of the foot of unclear aetiology. It is the most common musculoskeletal congenital disability with an overall incidence of 1:1000. The male: female ratio is approximately 2:1, and 50% of the cases are bilateral. A genetic component is strongly suggested with a familial occurrence of 25%

## Applied anatomy

Soft tissue and bony deformities contribute to the characteristic deformity noted in a clubfoot.

### Muscle contractures (CAVE)

#### Midfoot

- Cavus (tight intrinsics, flexor hallucis longus, flexor digitorum longus).

#### Forefoot

- Adductus of the forefoot (tight tibialis posterior).

#### Hind foot

- Equinus (tight Achilles tendon).
- Varus (tight Achilles tendon, tibialis posterior and tibialis anterior).

### Bony deformity

The talar neck is displaced medially and deviated plantarly. The calcaneus (hind foot) is in varus and rotated medially. The navicular and cuboid bones are displaced medially

## Clinical findings

### History

- Birth history: Normal vs Caesarean section, duration of pregnancy, pre- or perinatal complications.
- Developmental history and milestones.
- Family history: Spinal defects, clubfoot in the family.
- Previous treatment: conservative (casting) or surgery.

### Examination

#### Look

- Syndromic features: Facial, disproportionality.
- Spinal defects.
- Lower limbs: affected limb smaller and atrophied.
- Foot: smaller posterior and medial crease
  - Hind foot equinus and varus
  - Midfoot cavus
  - Forefoot adduction

#### Feel

- Palpable talus head (uncovered).
- Empty heel.

#### Move

- Mobile or rigid.
- Correction of adduction and equinus.
- Anterior tibialis and abductor response.
- Record ROM for plantar flexion and abduction.

Note: A deformity that completely corrects into abduction and dorsiflexion is positional/postural and not a true clubfoot deformity (intra-uterine position).

## Neurovascular

Standard lower limb neurovascular examination.

## Special investigations

- Radiology: X-rays usually not needed.
- Clubfoot deformity can be diagnosed intra-uterine with ultrasound.

## Commonly associated conditions

- Arthrogryposis
- Myelodysplasia



*Images of children with bilateral clubfeet, highlighting the deformity of pes cavus, adductus, varus and equinus. A series of plaster applications illustrates the progressive correction with treatment.*

## Management

### Non-surgical

Ponseti method, including serial casting correcting in sequence the cavus, adductus, varus and equinus. This may include an Achilles tenotomy. Follow-up with foot abduction braces or Dennis Brown boots is also necessary.

### Surgical

#### Soft tissue

- Posterior medial release, Achilles tendon lengthening, Tibialis anterior transfer

#### Bone

- Medial column lengthening and lateral column shortening
- Talectomy
- Triple arthrodesis

## Essential takeaways

- Specific deformity of the clubfoot (CAVE).
- Difference between a postural and clubfoot deformity.
- Management: Ponseti casting.

## References

Lovell and Winter's Paediatric Orthopaedics 7th edition, pp. 1410–1428

Malhotra, R et al. Ponseti technique for the management of congenital talipes equinovarus in a rural set-up in India: experience of 356 patients. *Children* 2018, 5(4), 49.

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## Recommended reading

Malhotra, R et al. Ponseti technique for the management of congenital talipes equinovarus in a rural set-up in India: experience of 356 patients. *Children* 2018, 5(4), 49.

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