

What's New in Severe Deformity Correction

The German Perspective



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KEYWORDS

- Osteotomy • Foot deformities • Fusion • Chopart joint • Tendon transfer
- Arthrodesis

KEY POINTS

- Bone biology is more important than absolute stability and compression.
- The goal of treatment is a pain-free, plantigrade, shoeable foot; this is more important than joint preservation.
- In neurogenic deformity, fusions reduce recurrence rates.
- The bony correction should take place around the center of rotation angle of the deformity, which in most cases is at the Chopart joint.
- Tendon transfers and soft tissue correction alone cannot correct deformity. However, tendon transfers are essential in addition to fusions to balance the foot.

INTRODUCTION: NATURE OF THE PROBLEM

Hindfoot and midfoot deformities can occur secondary to several neurologic and congenital conditions, and neurologic conditions can cause different foot deformities. However, a variety of deformities can be approached using the same broad treatment principles.

This article outlines these principles and then discusses some example cases. This approach is suitable in cases of Charcot-Marie-Tooth disease, cerebral palsy, spina bifida, clubfoot, and polio. However, the management of Charcot arthropathy is not discussed because this requires a different approach.

INDICATIONS

Every severe foot deformity, such as cavus foot, cavovarus foot, calcaneal foot, equinus foot, and equinocavovarus foot.

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CONTRAINDICATIONS

- Vascular disease of the lower limb
- High-grade infection
- Osteomyelitis

SURGICAL TECHNIQUE/PROCEDURE

The aim of surgery is to achieve a pain-free, plantigrade, shoeable foot. Patients should be prepared to consent to personalized correction, including bone graft. The exact operative plan may need to be modified intraoperatively.

The procedures can be divided into basic 4 steps undertaken in this order:

1. Release/harvest of the tendons needed for tendon transfers and sometimes the Achilles tendon
2. Bony correction of the hindfoot
3. Bony correction of the forefoot to fit the repositioned hindfoot
4. Tensioning and fixation of the transferred tendons

The bony correction starts with the fusion of the talonavicular joint.

The authors prefer to use Kirschner (K) wires for fixation, especially in younger patients, because this leaves a greater surface area of healing bone to unite the fusion site. Either 2 or 3 wires are used across the fusion site and are left in for 6 weeks before being removed in the plaster room. In addition, the authors frequently temporarily transfix the ankle joint in a neutral position for 2 to 6 weeks. This method allows for easy tensioning and protection of the tendon transfers and avoids plaster errors in the postoperative period.

Hindfoot/Midfoot Procedures

- Chopart fusion (Imhäuser procedure)
- Triple fusion
- Triple fusion with Lambrinudi procedure
- All of the above can be augmented by corrective osteotomies; for example, lateral closed Dwyer osteotomy

Forefoot Procedures

- First metatarsal dorsiflexion osteotomy, Tubby procedure
- Modified Jones procedure for claw hallux
- Russel-Hibbs procedure for claw toes

Soft Tissue Correction

- Total split posterior tibial tendon transfer (T-SPOTT) to the tibialis anterior and peroneus brevis tendon
- Steindler procedure to transect the plantar aponeurosis
- Achilles/gastrocnemius tendon lengthening (distal or proximal)

PREOPERATIVE PLANNING

The planning must include the full history, including any previous treatment and diagnoses, especially the type of neurogenic or spastic disease.

In cases of childhood deformity and unclear primary disease, the history should include precise details of complications during pregnancy and childbirth. Furthermore, the growth of the child should be assessed.

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