Treatment of Severe Recurrent Clubfoot

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KEYWORDS

- Clubfoot • Surgery • Pes equinovarus • Pediatric foot deformity
- Clubfoot recurrence • External fixation

KEY POINTS

- Treatment of severe recurrent clubfoot deformity, especially after previous open release surgeries, can still be challenging.
- Most clubfoot recurrences can be treated using the Ponseti method; only the most rigid and deformed feet in children and young adults need more invasive interventions to obtain good foot function.
- Numerous surgical procedures have been described in the literature over the last century, with many rendered obsolete and most resulting in stiff feet with limited function.
- Indicating the right treatment and surgical procedure is crucial and should always be guided by individual patient needs and functional considerations.

A video that shows postoperative results of a patient diagnosed with fixed equinus accompanies this article at http://www.foot.theclinics.com/

INTRODUCTION

Clubfoot surgery has a long and comprehensive history[1] and the treatment of congenital clubfoot has challenged the orthopedic surgeon throughout the centuries. Surgical correction and interventions have been developed and evolved at the beginning of the 20th century related to improvements and safety of general anesthesia. As a result, nonoperative and minimally invasive techniques were abandoned as outdated, time consuming, and insufficient. At the height of this development, extensive soft tissue releases have been performed in infants often age 3 to 6 months with various

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approaches and techniques.[2–4] Long-term follow-up diminished the results of these extensive operations, in part because scarring and early arthrosis have been recognized as the most common long-term complications.[5–7] However, failure was not only seen in the long term. Major complications were also met during or after surgery. Failed correction, wound breakdown, skin necrosis, and overcorrection, growth disturbance with massive shortening of the foot and leg were encountered.[8]

These complications and the disappointing long-term outcomes resulted in a reevaluation of clubfoot treatment and a turn toward a less invasive method using detailed serial casting that has already proven effective.[9–12] Doubted by many and suspiciously eyed by others, the rediscovery and rise of the Ponseti method for clubfoot treatment has changed the approach to clubfoot fundamentally. In the meantime, there is a worldwide spread of the Ponseti treatment.[13] With proper casting technique, the right timing and indication for percutaneous Achilles tendon lengthening, optimal support to ensure bracing compliance, frequent follow-up to detect early recurrence, and treatment of recurrence with casting and/or tendon transfers, open joint surgery can be avoided in almost all cases of congenital idiopathic clubfoot,[14] and with good functional outcome.[15] Today the Ponseti method has become the gold standard treatment for congenital clubfoot and the number of operative procedures has decreased significantly.[10,16]

The Ponseti method is additionally applied to persistent, residual, and recurrent clubfoot.[17,18] Tibialis anterior tendon transfer (TATT) with or without prior casting, and with or without percutaneous Achilles lengthening, is the treatment of choice for recurrent or late presenting clubfoot.

Because almost all clubfoot deformities and recurrences can be treated successfully with the Ponseti method, extensive operative interventions have become mostly obsolete and are on the verge of extinction. For the sake of functional clubfoot treatment, this is a highly positive development. However, it has the potential to become a problem for the very few recurrent, neglected, previously operated, or syndromic cases that cannot be managed sufficiently with the Ponseti method. Those cases are usually feet after previous extensive surgery, severe stiff recurrences owing to lack of follow-up, nonidiopathic clubfoot, and stiff residual clubfoot components in children and young adult (**Box 1**). This overview on the treatment of severe recurrent clubfoot discusses the different aspects and pathoanatomy of the recurrent clubfoot and describes the treatment options according to the deformity.

DEFINITION OF SEVERE RECURRENCE

Deformity in previously treated clubfoot is usually defined as residual/resistant or recurrent/relapsed. Although residual deformities are those that have never been corrected,

Box 1
Biggest challenges in clubfoot surgery

- Defining a realistic goal of treatment.
- Indicating the individual best treatment approach.
- Low frequency of the procedures owing to the extremely rare indication for open surgery.
- Stiffness in feet that are nonresponsive to the Ponseti method is also a challenge for open surgery.
- Diminishing experience with operative techniques for correction of clubfoot.

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