

Pathology and management of flexible flat foot in children.
Yoshino Ueki, Eisuke Sakuma, Ikuo Wada.
Journal of Orthopaedic Science 24 (2019) 9-13.

Background: Flexible flatfoot is ubiquitous in newborns and young children and is rarely symptomatic. Flexible flatfoot is characterized clinically by restoration of the medial longitudinal arch when tip toe standing or non weight-bearing position. Conversely, rigid flatfoot maintains the flatness of the arch and valgus of the hindfoot when tip toe standing. In this paper, the authors describe the pathology and management of flexible flat foot in children, along with the diagnostic procedure and orthotic treatment.

Does flexible flat foot deformity spontaneously improve?

Various studies have proven that the height of the longitudinal arch usually increases spontaneously during the first decade of life in almost all normal children. This occurs through these three processes: (1) With neuromuscular development - balance is improved and also increasing fine motor control of the distal muscle groups
 (2) The physiological joint laxity begins to diminish.
 (3) The structures of the foot are increasingly ossified, providing greater rigidity to the bone of the weight-bearing tripod.

ACADEMIC P.E.A.R.L.S

Pediatric Evidence And Research Learning Snippet



FLEXIBLE FLAT FOOT IN CHILDREN

What happens in the foot during the stance phase? During the latter part of the stance phase the tibia and talus externally rotate, therefore the subtalar joint complex inverts, resulting in the entire foot being locked. In the flexible flat foot however, the foot does not show this normal inversion during the latter part of the stance phase, leaving the foot relatively unstable. This could potentially lead to foot and lower leg fatigue.

Short tendo-Achilles: The presence of a contracture of the gastrocnemius-soleus complex (short tendo-Achilles) may prevent normal dorsiflexion of the ankle joint and the mechanical stress shifts to the subtalar joint, which is often accompanied by functional disability and pain.

Radio-graphical evaluation : Lateral weight-bearing radiographs are used in the assessment of flat foot. Three commonly used radiographic indices are: **Meary's talo-1st metatarsal angle (TI-MTA)**, **angle of plantar flexion of the talus** also called talo-horizontal angle (TPF) and **talocalcaneal angle (TCA)**.

Management of flexible flat foot : The authors mainly treat flexible flat foot patients by using orthoses. The lateral weight-bearing radiograph was commonly used for the evaluation of the flat foot. They have classified the flat foot into three types: **talo-navicular sag (T-N sag)**, **naviculo cuneiform sag (N-C sag)** and **talonavicular and naviculo-cuneiform sag (Mixed sag)** following the criteria of Tachdjian. They recommended the N-C sag and Mixed sag groups to be treated by using orthoses, while kept a status of watchful waiting for the T-N sag group. However, sometimes the pain may increase after orthosis treatment which should be considered.

EXPERT COMMENT



"Most of the infants & toddlers have flatfeet which is both normal and asymptomatic and hence, need no treatment. The flexible flatfoot which are of severe degree (sometimes due to underlying hyperlaxity or other medical condition) may sometimes benefit from orthosis and very rarely need surgery. However, the other differentials must be ruled out as congenital vertical talus etc. The painful or rigid flatfoot, seen more commonly in adolescents, needs detailed clinical and radiological evaluation to look for the underlying cause and treated accordingly"

Dr Somesh Virmani DNB (Orthopaedics),
 Fellowship Paediatric Orthopaedics (CMC, Vellore)
 Senior Consultant, Paediatric Orthopaedics
 Medanta The Medicity, Gurugram

DR MANINDER S DHALIWAL

Editor - Academic Pearls
 pedpearls@gmail.com

DR BAKUL JAYANT PAREKH

President, IAP 2020

DR PIYUSH GUPTA

President, IAP 2021

DR G.V. BASAVARAJ

Hon. Secretary Gen. 2020-21

Reference

Ueki Y, Sakuma E, Wada I. Pathology and management of flexible flat foot in children. J Orthop Sci. 2019 Jan;24(1):9-13. doi: 10.1016/j.jos.2018.09.018. Epub 2018 Oct 23.