# Congenital diastasis of distal tibiofibular joint. A case report and treatment presentation

*Chalatsis G. MD, MSc[1,2]; Mitrousias V. MD, PhD[1,2]; Stefanou N. MD[1] ,PhD[2]; Arnaoutoglou C. MD, PhD[1] Rigopoulos N, MD, PhD[1,2]; Malizos KN, MD, PhD[1,2]*

*[1]General University Hospital of Larisa, Department of Orthopedic Surgery and Musculoskeletal Trauma*

*[2] University of Thessaly*

## ABSTRACT

**Purpose**

Congenital distal tibiofibular diastasis is a rare disorder of unknown etiology, first described in 1972. Purpose of our study is to present a rare case and the treatment plan.

**Methods**

An infant female patient was presented to the paediatric-orthopaedic clinic in order to be examined for congenital clubfoot deformity of her left lower extremity. There was an obvious talipes equinovarus foot deformity, hypoplasia of the ipsilateral great toe and deformation of the ankle. X-rays were diagnostic for a profound diastasis of the distal tibiofibular joint.

**Results**

The patient underwent a Ponseti serial casting treatment for the equinovarus deformity in order to obtain a plantigrade foot. Furthermore at the age of 2, Achilles tendon and posterior tibialis lengthening was performed. At the latest follow-up, one year post-op, the child had a bipedal gait pattern without support, a plantigrade foot, active 10 degrees dorsiflexion and she was enjoying all activities of daily living. X-rays demonstrated a shortening of 0,6 cm in the left tibia compared to the contralateral side.

**Conclusions**

Distal tibiofibular joint diastasis is one of the tibia hemimelia. Basic treatment goals were: a plantigrade foot, limb length equalization and ankle joint stability. In our case, serial casting and soft tissues procedures lead to satisfactory clinical outcome.

## CONTACT

Chalatsis Georgios Paraskevas

*General University Hospital of Larisa, Department of Orthopedic Surgery and Musculoskeletal Trauma*

Email: ghalatsis@hotmail.com

Phone: +30 6977992086

## INTRODUCTION

Congenital distal tibiofibular diastasis is a rare disorder of unknown etiology, first described in 1972 [1]. Since then sparse cases of this condition have been reported in the English literature [1-15]. Main clinical presentations are equinovarus foot deformity, leg length discrepancy (LLD), distal tibia tapering, absent ankle mortise [2, 3].

Associated anomalies usually include hypoplasia or aplasia of the first ray, tarsal anomalies [4- 6], hand anomalies [7, 8], hypospadias [4- 6], visceral anomalies (5-7, 9, 10], vertebral anomalies [6], cardiac anomalies [6, 10] and imperforate anus [2, 5].

We present a case of a new born girl with congenital diastasis of distal tibiofibular joint and equinovarus foot deformity and the treatment plan, along with a brief review of the relevant English literature.

The parents of the patient were informed that the data from their daughters case will be submitted for publication and they provided written consent.

## METHODS AND MATERIALS

A new born girl was presented to the paediatric-orthopaedic outpatient clinic of our hospital in order to be examined for a possible congenital clubfoot on her left lower foot. During the clinical examination talipes equinovarus foot deformity and hypoplasia of the great toe of the ipsilateral foot was present. The shape and size of distal tibiofibular and ankle joint was enlarged comparing to the contralateral foot. Plain X-rays were prescribed and during their presentation, diastasis of distal tibiofibular joint was diagnosed (Figures 1, 2).

## RESULTS

The newborn was immediately treated with Ponseti casting for equinovarus deformity. At the age of 2, achilles tendon and posterior tibialis lengthening was performed in order to further improve the deformity. At the latest follow-up, one year after surgery, the child was walking with a bipedal gait pattern without support, a plantigrade foot [Figure 3], active 10 degrees dorsiflexion [Figure 4] and she was enjoying all activities of daily living. X-rays and clinical assessment demonstrated a shortening of 0,6 cm in the left tibia compared to the contralateral side [Figure 5]. Further follow up was planned until skeletal maturity in order to monitor the leg length discrepancy.

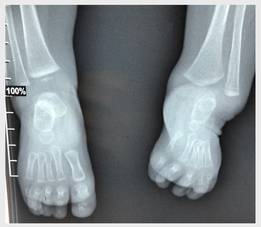


**Figure 1.** Plain radiographs of the lower feet

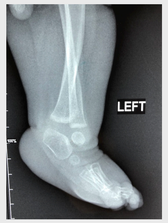


**Figure 2.** Plain radiograph of the left lower foot

**Figure 3.** 1 year post-op the girl demonstrated bipedal gait pattern

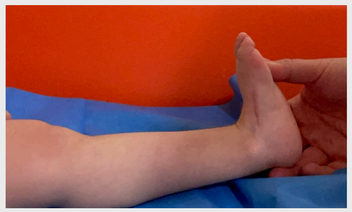

**Figure 4.** 1 year post-op the patient is able to active dorsiflex her foot.

## DISCUSSION

Distal tibiofibular joint diastasis is included in tibia hemimelia disorders with unclear pathogenesis. First Jones [5] presented 4 types of tibia deficiency and later Kalamchi and Dawe modified this classification, describing three types [11]. According to Jones Type IV tibia hemimelia is characterized by distal tibiofibular diastasis and according to Kalamci the Type III. Later, Weber proposed a new classification system with 7 types of tibia deficiency [16]. The second type characterizes the cases with distal tibiofibular diastasis.

Ominus in his research in 1990 [9] described 2 types of congenital tibiofibular diastasis. Type I with vertical diastasis and type II with lateral tibia dysplasia, tapered tibia and horizontal diastasis. Bansal proposed also a third type of diastasis with a wide congenital diastasis of distal tibiofibular joint with a separate soft tissue cover [12].

The pathogenesis of distal tibiofibular joint diastasis is not clear. Tuli [1] believed that it was due to osteochondrosis of distal tibia epiphysis. Others pointed that main cause for the condition is hypodevelopment of the distal part of the tibia [4, 7, 8]. The hypoplasia of the distal end of tibia results to fail in the forming of plafond and distal interosseous ligament which leads in failure of mortise development [2].

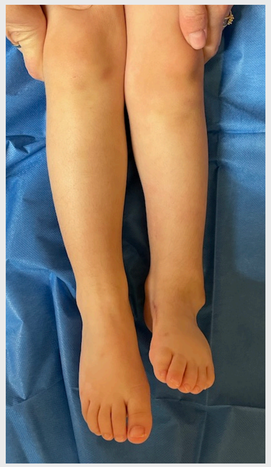

**Figure 5.** 1 year post-op leg length discrepancy of 0.6 cm was recorded.

## DISCUSSION

Basic treatment goals are to restore the plantigrade foot, to equalize limb length and to stabilize the ankle joint. Treatment options vary regarding to the clinical presentation and have been used with mixed combinations. Serial casting [1, 2, 4, 6, 7, 9, 10], soft tissue release and Achilles tendon lengthening [1, 3, 4, 6, 9] to correct talipes equinovarus and achieve plantigrade foot and additionally surgical interventions for restoration of ankle mortise, foot centralization and fusion of the fibula with the tibia [1, 4, 8, 12-14]. Limb lengthening [3, 6, 9] and epiphyseal closure of contralateral proximal tibia and fibula [3, 6] to restore limb equalization. In some severe cases, Syme amputation [5, 11, 12] was unavoidable.

## CONCLUSIONS

In our case, the treatment plan was comprising serial casting according to the Ponseti method and soft tissues procedures of left lower foot (Posterior tibialis and Achilles tendon lengthening). The clinical outcome one year post-op was satisfactory, however, further follow up will be needed until skeletal maturity.

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