Case Report

An Unusual Case of Lower Tibial Stress Fracture in a Patient of Meningomyelocele with Equinus Deformity

Kothari S Y[1], Gupta Ajay[2], Kumar Amod[3]

Abstract

A patient of meningomyelocele (MMC) with severe equinus deformity at left ankle, presented with pain and swelling above the ankle. The patient was ambulatory and walking independently bearing weight on anterior aspect of heads of metatarsals. On clinical and radiological examination a stress fracture of distal tibia angulating posteriorly was noted. This case is presented for its uniqueness and also to highlight the significance of altered biomechanics which cause stress fracture.

Key words: **Meningomyelocele, stress fracture, equinus deformity.**

Introduction:

In a stress fracture or fatigue fracture clinical and radiological signs of healing are established before that of fracture are apparent. It is the result of excessive/ abnormal tension or traction stress on both cortices of the bone. According to Wolff's law every change in the form and the function of a bone, or in its function alone, is followed by certain definite changes in its internal architecture and secondary alterations in its external confirmation. It derives from this law that in confirmation to a particular type of stresses over the bone trabeculae, the trabeculae orient themselves along the stress lines so as to resist the stresses effectively[1]. New bone trabeculae are formed in the line of excess/ abnormal stress before the original trabeculae show signs of fracture. March fracture and Dance fracture are well known entities.

Author's affiliations:
[1] MS (Ortho), DNB (PMR)
[2] DPMR, DNB (PMR)
3 MBBS, DPMR (PMR)
Department of Physical Medicine and Rehabilitation, Vardhman Mahavir Medical College and Safdarjang Hospital, New Delhi

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Correspondence:
Dr. S.Y. Kothari
MS (Ortho), DNB (PMR)
Special Director General of Health Services & Professor of PMR.
C-II/205, Satya Marg, Chanakyapuri, New Delhi 110021
Email: kothari_sy@yahoo.com

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Case Report:

A case of meningomyelocele with paralytic equinus at left ankle, walking with foot tilting posteriorly, putting excessive posterior tilting torque on lower tibia, is reported here (Fig 1). The child had developed stress fracture of the lower end of the tibia, as seen in the x-ray (Fig 2). Serum alkaline phosphatase was within normal limits indicating normal bone turnover. Altered biomechanics are explained in Fig 1, which caused repetitive and abnormal stresses in turn causing lower tibial stress fracture.

The patient was treated by correction of ankle deformity by lengthening of tendoachillis and subsequent application of a well padded ankle foot orthosis.

Discussion:

Tibial fractures are the most common lower extremity stress fractures[2]. Anterior stress fracture of the tibia usually result from tension stress and known for non-union[3,4]. Posteromedial stress fracture occurs on the compression side of the tibia and has a good prognosis[5]. Tibial stress fracture with meningomyelocele presents with painless swelling and warm surface. Its management depends upon correction of the biomechanical abnormality.

In normal human gait most of the energy at heel strike is absorbed by the movements at the subtalar joints. In

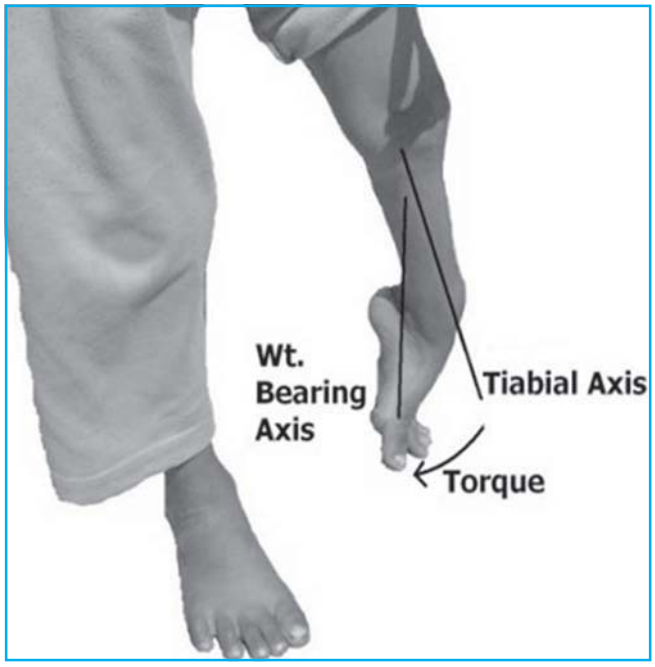

Fig 1- *Child with Altered Biomechanics in Weight Bearing Position and Torque Angle between the Tibial Axis and Weight Bearing Axis*

Fig 2- *Lateral Radiograph of Left Lower Limb Showing Tibiotalar Angle of 32 Degrees and Stress Fracture Angulating Posteriorly*

severe equinus foot as in our case, the anterior aspect of the fore foot strikes the ground. The shock absorbing capacity of the subtalar joint is lost. In subsequent stage flatfoot position is not achieved and weight is not distributed over the foot. In this child the equines deformity is so large (32 degrees) that the heel strike is absent. Due to deforming force at ankle acting anteriorly and ground reaction force acting posteriorly, undue strain was placed on anterior tibial cortex which lead to stress fracture angulating posteriorly. Joint contractures, muscle weakness and repetitive stresses are predisposing factors for tibial fracture[6].

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