TIBIAL TORSION MEASURED BY ULTRASOUND IN CHILDREN WITH TALIPES EQUINOVARUS

M. KRISHNA, R. EVANS, A. SPRIGG, JOHN F. TAYLOR, J. C. THEIS

From Alder Hey Children's Hospital, Liverpool and Liverpool University

Previous clinical studies have studied tibiofibular torsion by measuring the angular difference between a proximal (often bicondylar) plane and a distal bimalleolar plane. We measured the angular difference between the proximal and distal posterior tibial planes as defined by ultrasound scans.

We found no significant torsional difference between the right and left tibiae of 87 normal children, nor between their different age groups.

The mean external torsion of 58 legs with congenital talipes equinovarus was 18°; significantly less than the mean 40° in the normal children and 27° in the clinically normal legs of the 22 patients with unilateral congenital talipes equinovarus. We did not confirm the previously reported increase in external torsion with increasing age.

The relative internal tibial torsion we have demonstrated in patients with congenital talipes equinovarus must be differentiated from the posterior displacement of the distal fibula observed by others and which may result from manipulative treatment.

The relative internal tibial torsion we found in the clinically normal legs of children with congenital talipes equinovarus is further evidence that in this condition the pathology is not confined to the clinically affected foot.

An inward deviation of the forefoot in the transverse plane, which produces intoeing, may be brought about by deformity within the foot such as adduction of the metatarsals or an inward curvature of the talus and calcaneus. Alternatively, in the growing child, deforming forces might cause an inward twist at the level of the ankle, in which case the deformity would be accompanied by forward displacement of the distal fibula in the fibular notch. Similar forces, resulting from a baby lying prone with hips and knees flexed, and feet turned in under the buttocks, may produce true internal torsion of the tibia with the positions of the malleoli remaining undisturbed in their relation to each other. In either case, whether the deformity is at the level of the ankle, or in the tibia itself, the axis of the tibiotalar articulation is internally rotated in respect to the axis of the knee.

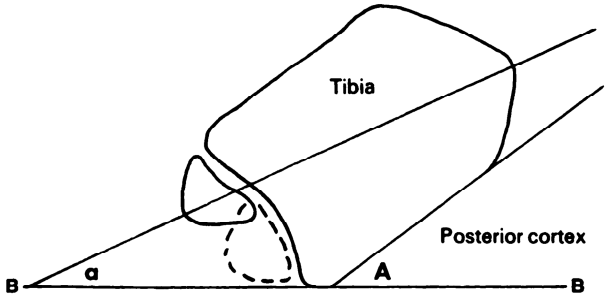

Fig. 1

Diagram showing a cross-section of the distal fibula and tibia in relation to the bicondylar plane B – B. The bimalleolar plane generally makes a smaller angle (a) with the bicondylar plane than does the plane of the posterior tibial surface (A). However, posterior displacement of the fibula (broken lines) increases the angle of external tibiofibular torsion as measured between the bicondylar and bimalleolar planes.

In congenital talipes equinovarus (CTEV) pathological adduction of the metatarsal and tarsal bones is well recognised (Irani and Sherman 1963; Ritsilä 1969). However, there has been less agreement about the anatomy of the ankle and the tibia. Previous studies have examined the relationship of the proximal bicondylar axis to the bimalleolar axis (Fig. 1). Hutchins et al (1986)

M. Krishna, MS(Orth), Registrar in Orthopaedics
R. Evans, MCh(Orth), FRCS Ed, Senior Registrar in Orthopaedics
A. Sprigg, DMRD, FRCR, Consultant Radiologist
J. F. Taylor, MD, MCh(Orth), FRCS, Consultant Orthopaedic Surgeon
Alder Hey Children's Hospital, Eaton Road, West Derby, Liverpool L12 2AP, England.

J. C. Theis, MD, FRCS Ed(Orth), Senior Lecturer in Orthopaedic Surgery
The University Department of Orthopaedic Surgery, Dunedin Hospital, Dunedin, New Zealand.

Correspondence should be sent to Mr J. F. Taylor at Rutherglen, 39 South Road, Grassendale Park, Liverpool L19 0LS, England.

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