

Functional Varus Due to Tibial Torsion

By **ALFONS R. GLAUBITZ**

Elizabethton, Pa., Member of the National Advisory Council to the American Board for Certification

When Charles E. Irwin, M.D., presented his paper on the iliotal band, he paid special attention to the varus position of the foot and its gait when fitted with a long leg brace, when a tight iliotal band was present. Doctor Irwin identified this gait, one of "Functional Varus."



Alfons R. Glaubitz

Previous to this, corrections applied to overcome functional varus were: outside heel and sole wedges; outflared heels and soles and the application of an outside "T" strap; or the shoe was placed in a larger degree of toe-out on the stirrup.

Functional varus may have many causes including severe trauma, but the majority of functional varus is found in polio and, in cases where an external rotation of the foot is considered normal.

The object of this paper is to familiarize the Orthotist with the problem confronting him and how to properly brace a tibial rotated foot. Several elements are present to recognize the deformity. The patient's gait is one of functional varus, e.g., he will walk on the outer border of the shoe and his gait is unstable; second, the leg is internally rotated in the brace and the patella is no longer in the center of the brace. In the posterior view the medial condyle of the limb is posterior to that of the medial knee brace joint.

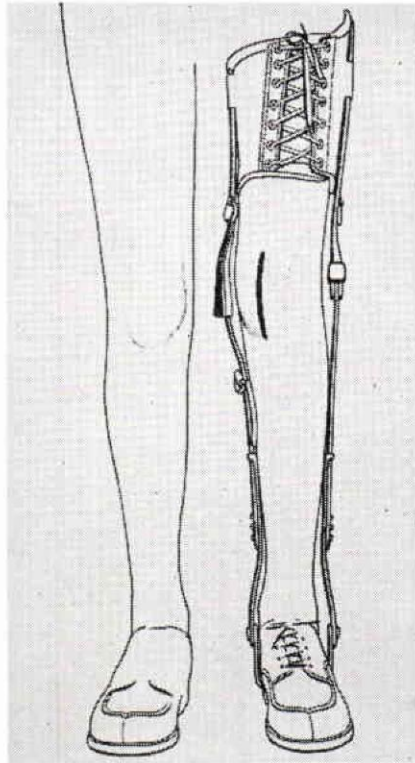


Fig. 1. Showing internal rotation of a leg in the brace. Notice that the knee cap of the leg is not in the center of the brace.

In the usual attachment of the shoe or other foot appliance, a certain degree of "toe-out" on the brace is always considered proper. The sagittal axis of the ankle joint in the tibio-talar articulation has its limitation in internal and external rotation. It is the limitation of the internal rotation of the ankle joint which causes the internal rotation of the leg in the brace and forcing the foot into varus.

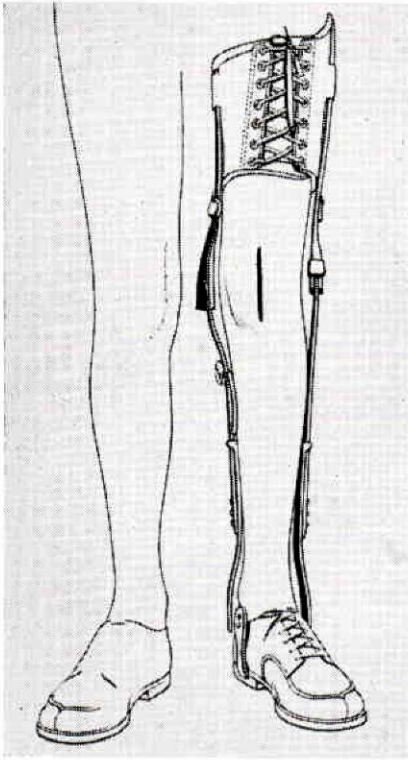


Fig. 2. After the lateral bar of the brace is twisted externally in its length, the leg will follow, and the knee cap will then be in the center of the brace. Take notice that the inner bar of the brace is now posterior to the stirrup ankle joint.

Method of Bracing

The brace is completed in the usual manner for the fitting with the usual toe-out position of the shoe in the brace. The inner below-the-knee brace bar is not attached to the stirrup and it is also advisable not to fasten the calf band to the inner bar.

The patient may either stand erect or be in a reclining position when the brace is applied. The Orthotist will then apply his bending irons to the lateral side of the brace above the ankle joint and twist the foot out until the patella is in the center of the brace and the medial condyle of the limb coincides with the medial knee joint center of the brace.

The medial side of the stirrup will

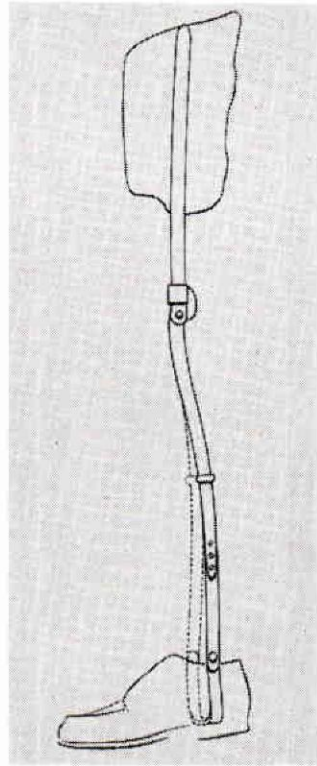


Fig. 3. Showing the anterior bend of the inner bar of the brace to meet the forward located stirrup ankle joint.

now be far in front of the below-the-knee brace bar. To meet the stirrup in its forward position, the inner bar is hammered or bent in its entire length anteriorly to meet the stirrup ankle joint.

Because of the longer distance which now exists between the knee and ankle joint, the inner bar will become a trifle longer. A previous drilling of screw holes to the inner bar is therefore not advisable. The calf band is then fitted to its new position. Substituting for a longer one is not necessary and not advisable.

Once the right amount of external rotation of the shoe on the brace is given, functional varus will have

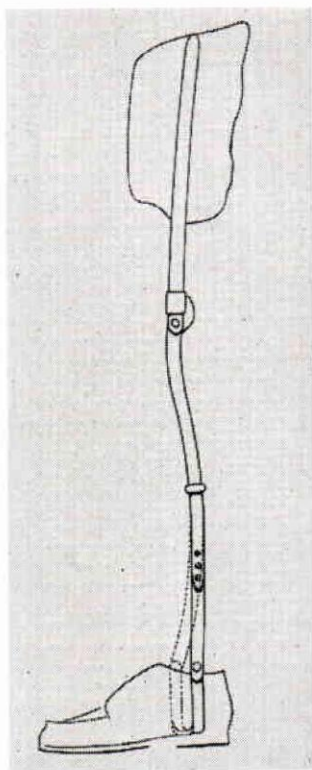


Fig. 4. To illustrate better the need of the new position of the inner brace bar, the anterior bend of lower end of the inner bar is exaggerated.

ceased to exist. The addition of a pelvic band to the long leg brace has no ill effect on the newly acquired position of the foot, as the changes made on the brace are below the frontal plane of the knee axis.

References

Irwin, C. E. J.—The Iliotibial Band—*J. Bone & Joint Surg.*, 34A: 141-146, January 1949.

Outland, Tom—Personal Communication.

Reprints of articles are available. Inquire of: OALMA, 336 Washington Bldg., Washington 5, D. C.

Alfons Glaubitz completed his apprenticeship and trade school course in Germany, receiving his Master's Degree in Bracemaking in 1925 from the German Orthopedic Trade Commission. After working for some time with an appliance company in Brooklyn, New York, he opened his own establishment at Elizabethtown, Pennsylvania. In 1939 he founded and still directs another brace shop at the crippled children's hospital in Elizabethtown. He is the author of several articles on appliances which have appeared in magazines and books. Mr. Glaubitz is a member of the National Advisory Council to the Certification Board representing Eastern Pennsylvania.

“What's (New)s”

- THE WORLD CONGRESS of the International Society for the Welfare of Cripples will be held at The Hague in the Netherlands, from Sept. 13 to 17, 1954. This is the sixth of these conferences for professional workers and others interested in services for the physically handicapped. Persons interested in attending may obtain additional information from OALMA Headquarters, 336 Washington Bldg., Washington 5, D. C.
- FOUR SUCTION SOCKET SCHOOLS will be conducted this year by OALMA in association with the Prosthetic and Sensory Aids Service, VA. The dates are given in the table “Dates to Remember” which appears on the inside front cover of this issue.
- WALTER GOODWIN is the new chief engineer of Sierra Engineering Co. Both Goodwin and Robert Kindred, his assistant, have had long experience in the design and building of prosthetic devices, such as the two-load hook, the flat cable extensor and outside locking elbow hinges.