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Research

Matthew Dobbs, MD, is a pioneer in the treatment of vertical talus. His minimally-invasive method has caught the attention of pediatric orthopedic surgeons worldwide, and he is training other surgeons in the United States and internationally to use the method successfully. His method has greatly reduced the need for extensive surgery, and, as a result, has improved the short-term outcomes for vertical talus patients.

Along with Dr. Christina Gurnett, Dr. Dobbs is co-director of the Washington University Musculoskeletal Genetics Laboratory. Some of the accomplishments of his team have been the identification of a gene responsible for vertical talus as well as several genes implicated in clubfoot. Other discoveries in their laboratory include a new gene for distal arthrogyrosis as well as genetic loci for scoliosis.

Their ongoing research will benefit both medical professionals and patients to make treatment less invasive, more efficient and provide better long-term outcomes. To learn more about the medical research being conducted at St. Louis Children's Hospital by the physicians on the faculty of Washington University School of Medicine, visit StLouisChildrens.org/VerticalTalus.



Vertical Talus



What is Vertical Talus?

Vertical talus is a deformity resulting from the abnormal positioning of several bones in the foot. This creates a rigid, flat foot with a “rocker bottom.” One way to visualize this is to think of the arch of the foot curving down and out like the bottom of a rocking chair.



Vertical talus is sometimes referred to as Persian slipper foot because the affected foot resembles a slipper with the hindfoot (part of the foot closest to the heel) pointing down and the forefoot (near the toes) pointing up and out.

If left untreated, a child will start to walk on the inside of the foot. This leads to the formation of painful calluses, skin breakdown, and foot pain. It will also affect the child's gait (way the child walks) and ability to wear properly-fitting shoes.

How it occurs

Most children born with vertical talus have no other congenital problems. When it occurs in isolation it is referred to as idiopathic (“unknown” cause). In other cases, it may be associated with a chromosomal abnormality or occur as a part of a genetic syndrome or neuromuscular disorder that secondarily disrupts the structure of the foot. Medical examination by your doctor should be able to determine whether your baby's vertical talus is idiopathic. There is increasing evidence that isolated vertical talus is related to select gene mutations.



How it is treated

Ideally, treatment is started as soon as possible after birth. The treatment of vertical talus has evolved over the last decade to a minimally invasive approach that utilizes primarily serial manipulation and casting to achieve correction. This approach eliminates the need for more extensive surgery while still providing excellent correction.

Treatment plan

Stretching and serial casting

Initial treatment consists of gentle manipulation of the foot to stretch the contracted tissues. The doctor will stretch your child's foot into the desired amount of correction and apply a plaster cast in two sections, paying careful attention to the molding of the foot and ankle. Most of the treatment takes place in the doctor's office. This phase generally requires four to six plaster casts that are changed weekly in the office.



Surgical Intervention

Once the foot is corrected with casting, your child is scheduled for a minimally-invasive surgical procedure to insert a temporary pin to hold the bones of the foot in proper alignment. At the same time a percutaneous (without skin incision) heel cord tenotomy is performed to correct the tightness that remains in the ankle. After surgery, your child's foot is placed into a long leg cast for two weeks. When this cast is removed, your child will be measured for a special brace. At the same visit, a new long leg cast is applied and worn for four additional weeks. This cast will be removed in the operating room along with the pin.



Post-Operative Care and Bracing

After the final cast is removed, your child will begin wearing a brace (foot abduction orthosis) designed to prevent the vertical talus deformity from recurring. Even when well-corrected, vertical talus has a tendency to relapse. It is very important to follow all of your doctor's instructions

for bracing and stretching. If your child stops wearing the brace, he or she will likely lose correction and require additional casting and/or surgery. It is critical to wear the brace for the prescribed amount of time.

Brace-wearing schedule

For the first two months, the brace must be worn for 23 hours a day and then 12-14 hours a day (naps and nighttime) for 2 years. You must be consistent with the NIGHTTIME brace wear early in the treatment process, since the child will wear the brace only at night when he or she begins to walk.

Stretching

You will be taught stretching exercises for your child's foot that are to be done at every diaper change (at least four times a day) to maintain flexibility. It is important to be consistent with the stretching to maintain correction of the foot.

How can you help stretch and exercise your child?

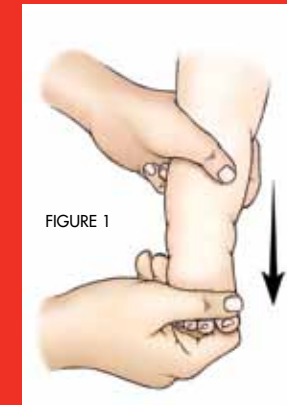


FIGURE 1

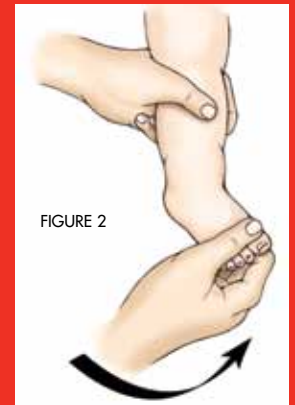


FIGURE 2

Ankle Plantar flexion and forefoot inversion

- Gently stretch your baby's foot at every diaper change.
- **Starting position:** Lay child on back. Place one hand on your baby's flexed knee. Grasp the heel of your baby's foot with the other hand. (Fig. 1)
- **Motion:** Gently push the foot down, and in, stretching as much as possible. Start with five repetitions and work up to 40 repetitions. (Fig. 2)