

MEDICAL MISSIONS STATESIDE PROGRAM: Clubfoot Case Presentation

Todd R. Gunzy, D.P.M.

The Institute has participated in two surgical missions since November 1999, visiting both Guatemala¹ and Venezuela. However, the stateside program is an alternate scenario to treat children with severe or recurrent deformities that require more extensive surgical procedures, physical rehabilitation, and continued convalescence. This program was established by Healing the Children Organization in the early 1980s for the purpose of providing more extensive, in-depth care to medically handicapped children. The program provides travel arrangements, visas, host families, and surgical services for the child, all totally free of charge. Countries involved with this program include all of Central and South American, China, Russia, Korea, Thailand, India, Sri Lanka, Pakistan, Afghanistan, Ireland, Italy, Ethiopia, Egypt, Gambia, and Mexico.

Children are identified for this unique service during the screening process at a medical mission. A child with severe, neglected or recurrent deformity requiring significant surgical correction and benefiting from extensive physical therapy and prosthesis fabrication, would be considered a likely candidate. Occasionally, representatives in countries will contact Healing the Children (HTC) directly regarding extreme cases and request placement in the United States stateside program.

Once a child has been selected, a complete set of medical records, radiographs, clinical photographs, and social history are requested. The HTC medical committee reviews each case and makes recommendations as to which institution they feel can provide the appropriate medical care. This completed medical history is then forwarded to the appropriate hospital and physician. Participating physicians and hospitals are encouraged to send a letter stating their intent to provide free care which aids in securing the visa and travel papers for the child.

From the time a child has been located, arrangements are made with a qualified United States doctor whose responsibility is to acquire the services of a host hospital willing to donate all supplies and operating time. The hospital must also be

willing to allow the child to remain on the medical floor during postoperative recovery until it is determined that the child is stable. Transportation is arranged through donated frequent-flier miles, and coordinated by HTC, as are any necessary visas. Volunteer host families are also secured in the local area. These families agree to house and care for the child for approximately three to six months. The philosophy behind this special program is to provide medical treatment for those children unable to receive it in their local environment. In addition, it is hoped that the child will return to his or her country influenced by the humanitarianism of others with restored health and inspired to make a positive impact on society.

CASE PRESENTATION

A 2-year-old boy from Belize with a recurrent right clubfoot deformity was identified by the Janus Foundation, which then contacted its affiliated Rotary Club in California. In California, Dr. Christine Dobrowoloski, took particular interest in the child. She in turn contacted Dr. Tom Chang who referred the child to the Podiatry Institute's Medical Mission program. The Podiatry Institute, Healing the Children, Arizona, and the Janus Foundation worked together to coordinate the child's travel to Arizona for surgical correction. Healing the Children, Arizona located a host family to care for the child, and Banner Health Systems donated the necessary hospital services required for the surgery.

Upon arrival in Arizona, a complete history and physical was performed. The patient was born with a congenital talipes equinovarus deformity treated by a local orthopedic physician who casted the deformity on a weekly basis for seven months. It was suggested to the parents after seven months of conservative care that the child undergo surgical correction for the deformity. Surgery on the deformity solely targeted the Achilles, posterior capsule, posterior tibial tendon, flexor digitorum longus tendon,

and medial talonavicular joint capsule. The child was casted for two months following surgery. His parents began to notice a recurrence of the clubfoot deformity as he began to reach the age of independent ambulation. After functioning on the recurrent deformity for one year, arrangements were made for surgical correction in the United States.

Physical exam revealed a 4 cm hypertrophic scar along the posterior aspect of the Achilles region. A severe equinus deformity was evident, along with recurrent rearfoot varus and adduction of the forefoot. In stance and ambulation, the lateral column of the foot bore the weight of the body contributing to the c-shaped lateral border which was significantly elongated. This contributed to some internal torquing of the tibia, yielding a moderate degree of internal tibial torsion. Radiographic evaluation revealed a laterally deviated head of the talus with a negative Kite's angle. There was no surgical reduction to the talonavicular joint noted on anteroposterior view. Calcaneal inclination angle was zero secondary to severe equinus contracture. (Fig. 1) There was also a severe metatarsus adductus deformity.

Surgical Treatment

A four-quadrant approach, popularized by Goldner and Fitch² was used for this case. Attention was then directed to the posterior and medial aspect of the right foot where a modified Turco incision was performed.³ This incision extended to the first metatarsal neck with care being taken to gently ellipse the hypertrophic scar posteriorly. Sharp and blunt dissection was utilized to expose the flexor retinaculum which was then incised. The neurovascular bundle was mobilized and then retracted with a vessel loop.

In this case, the posterior tibial tendon was identified, noted to be iatrogenically scarred down and tethered to the medial malleolus. It was completely nonfunctioning, and therefore was excised in toto. The flexor digitorum longus tendon appeared very thin and atrophic resulting from previous lengthening. No contracture was noted so it was left untreated. The flexor hallucis longus and Achilles tendons were noted to be contracted, therefore they were lengthened in z-plasty fashion. The posterior subtalar and ankle joint capsules were divided, which yielded a significant increase in dorsiflexion



Figure 1. Preoperative radiographs indicating a non-existent Kite's angle on DP view, and a low calcaneal inclination angle with the inability of heel to purchase the floor.

of the contracture. The abductor hallucis muscle belly was completely excised from the wound in toto which is commonly performed by the author in either long-standing, recurrent, or neglected deformities. In the plantar vault, only the plantar fascia remained contracted so it was sharply divided.

The medial, dorsal, and plantar capsule to the talonavicular joint were opened with the aid of a skin hook and released.⁴ The author has successfully used a McGlamry metatarsal elevator to free the lateral TNJ capsule. This approach was used during this surgery and on successive clubfoot surgeries during the Venezuela mission with the Podiatry Institute in September, 2000. The superficial deltoid ligament was divided, however, care was taken to preserve the interosseous talocalcaneal ligament to prevent over-correction.⁵

A lateral incision was then made from the lateral malleolus to the fourth metatarsal base. The peroneal retinaculum, calcaneofibular ligament, and lateral subtalar joint capsule were released. Capsules to the calcaneocuboid joint, cuboid-fifth metatarsal joint, and cuboid-third cuneiform joint were released. A small, laterally-based wedge was removed from the cuboid to shorten the lateral column.

Reduction of the talonavicular joint with aid of a McGlamry metatarsal elevator was performed, and then it was fixated with a 0.062" K-wire. The subtalar and calcaneal-cuboid joint, including the cuboid osteotomy, were also anatomically aligned and fixated with 0.062" K-wires. All tendons were reapproximated and skin closure performed. A long-leg cast was then applied.

Postoperative Treatment

The child was hospitalized for two days for pain control and observation. The first cast change was performed under general anesthesia at one week postoperative. The second cast change occurred at six weeks, at which time the K-wires were removed. At three months, the cast was permanently removed, and physical therapy was initiated and continued for a period of four weeks. At the time of cast removal, a polypropylene night-splint was fabricated. It would be worn for the next 18 months to maintain correction and neutralize much of the metatarsus adductus which remained postoperatively.

Postoperative radiographs were taken at four months, at which time the talus was noted to be in proper alignment with the first metatarsal yielding a more normalized Kite's angle on AP view (24 degrees). Calcaneal inclination angle had also increased. (Fig. 2) The metatarsus adductus angle was still quite high, but no surgical treatment was rendered for this apparent deformity due to the child's age and open growth plates. This deformity will need a staged procedure in the future. Physical examination revealed a plantigrade foot during ambulation with slight in-toeing secondary to the metatarsus adductus deformity. Good strength was obtained for a normal gait cycle.

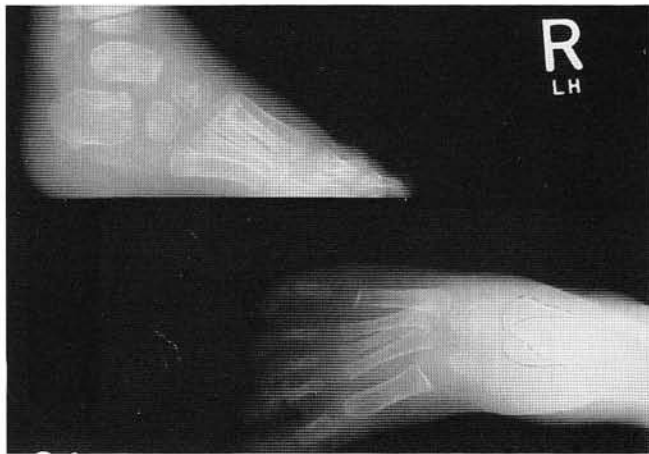


Figure 2. Postoperative radiographs. There is still a moderate amount of metatarsus adductus, but Kites' angle has increased to 24 degrees, there is an increase in calcaneal inclination angle, and heel purchase with the supporting surface is achieved.

Future Follow-Up

The child returned to Belize after spending four months in the United States receiving the appropriate care for a recurrent clubfoot deformity. Future follow-up will be achieved with assistance from the Belize liaison of the Janus Foundation via the Internet. There is also a possibility that the Podiatry Institute medical mission team may visit Belize, which would also enable continued follow-up, and allow the possibility to correct the metatarsus adductus deformity at a future date.

REFERENCES

1. Gunzy TR, Cicchinelli LD: The clubfoot experience of Guatemala. In Miller SJ, Mahan KT, Yu, GV, Camasta CA (eds) *Reconstructive Surgery of the Foot and Leg, Update '98* Podiatry Institute Publishing, Tucker, GA pp. 38 - 44, 1998.
2. Goldner IJ, Fitch RD: Idiopathic congenital talipes equinovarus In Jahss MH, (ed) *Disorders of the Foot and Ankle* W.B. Saunders, Philadelphia pp. 798-799, 1991.
3. Turco VJ: *Clubfoot* Churchill Livingstone, New York, 1981.
4. Blakeslee TJ: Congenital idiopathic talipes equinovarus: current concepts. *Clin Pod Med Surg* 14(1): 9-52, 1977.
5. Grant AO, Atar D: Highlights of TEV deformity. *Am J Orthop* 30:393, 1995.