A Tale of Two Pathologies:
A New Case Study of Congenital Talipes Equinovarus (CTEV):
Surgical Options

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In previous installments, the background and etiology of CTEV has been presented. In this series, two cases have been presented with the same diagnosis: resistant CTEV. The twist is that these cases are 50 years apart. Albert, born in 1951, had few options available regarding his treatment. Although CTEV was described as early as the time of Galen, little was done with it beyond the manipulation of the affected feet. With the advent of scientific medicine, an inadvertent product of the American Civil War, the development of modern anesthesia, and aseptic medical procedures, it was not until the late nineteenth century that the greatest strides have shaped medicine into the science and art we know today. To think that just over a half century ago, there was no hip pinning, joint replacement, hemodialysis and chemotherapy. We do live in the golden age of medicine.

Tommy, on the other hand, has all the modern marvels at his disposal, and his parents used them all. To be fair, the vast majority of cases (over eighty percent) are corrected successfully with conservative treatment. It is a very small percentage that require surgery, and a smaller percentage that requires the extensive surgery that Tommy underwent. Albert’s option was to have a surgical procedure in the surgical amphitheatre at the now closed St. Luke’s Hospital in Cleveland, OH. Recall that Albert’s internal rotation of the hip and associated foot deformity caused the hip articulation to literally pop out of place, making walking impossible. In that operating theater, his femur was cut in half, the upper portion externally rotated to place the ball back into the socket, and the lower half externally rotated to place the foot into a relatively normal position and the two halves reattached to each other with plates and screws.

Pretty revolutionary for the time. It still left Albert with an equinovarus foot that he had to live with for nearly a half-century until pedorthics entered his life. Today, he uses a cane, but remains ambulatory and now stands upright, something he was unable to do for many years. In fact, his friends never realized how tall he really was until he received his pedorthic modalities.

In this final installment, the types of surgical procedures will be described that are used to manage the complexity of CTEV. There is some controversy in the literature that surgical over-correction plays a key role in actually making certain cases of CTEV into resistant types.

Clubfoot comes in two styles: Postural (aka flexible) and Congenital.
A TALE OF TWO PATHOLOGIES: A NEW CASE STUDY ON CONGENITAL TALIPES EQUINOVARUS (CTEV) (PART 3)

Fig A is postural, and Fig B is Congenital. Notice the position of the hips in the two examples. Postural is the easier of the two to correct. Both share the same etiology, definition and incidence rate, however the difference is the subluxation of the Talocalcaneonavicular articulation. Forefoot adduction is at the Chopart’s, not the Lisfranc’s joint. The talus is the only constant deformity present with it being diminished in size and positioned in severe equinus. There is medial plantar deviation of the head, neck and articular surfaces and a short talar neck. In addition there is lateral and anterior positioning of the ankle mortise.

- Soft tissue deformities include in the tendons: contracted triceps surae, posterior tibial, flexor hallucis longus and flexor digitorum longus
- Anterior tibial and long extensors displaced medially
- Peroneals often elongated and posteriorly displaced
- Plantar intrinsics, plantar fascia, long and short plantar ligaments contracted
- Abductor hallucis contracted and bowstrung

In the ligaments:
- Posterior ankle, subtalar ligaments contracted
- Calcaneofibular, posterior talofibular and tibionavicular ligaments contracted
- Deltoid and calcaneonaviculavicular ligaments contracted
- Tarsometatarsal ligaments are contracted

The next two figures represent the osseous condition of both a normal and a foot with CTEV. Fig C and D

Soft tissue releases are always performed first. Surgery may be performed as early as six weeks, however, most surgeons will begin in the 3-5 month period following casting. Serial casting is always the first mode of treatment, beginning shortly after birth. Should casting be ineffective, then surgical options are discussed. The smaller the foot, the greater the risk of problems due to size. Nine months of age is the preferred time for surgical intervention. If soft tissue releases are not completely effective, then osseous procedures are performed.

The goal of surgery is to release or lengthen the structures and relocate the TCN.

There are two basic types of incisions made, Hockey stick which begins medially at the navicular tuberosity travels behind the medial malleolus and up the medial side of the lower leg, and Cincinnati incision begins medially at the navicular tuberosity and is continued circumferentially around the back of the heel to the base of the fifth metatarsal.

Fig E and F

Soft tissue structures resected are:
- Plantar fascia
- Plantar calcaneonaviculavicular ligament (Spring ligament)
- Superficial deltoid ligament (tibionavicular and tibiocalcaneal)
- Talonavicular joint capsule
- Master knot of Henry
- Calcaneofibular ligament
- Interosseous TC ligament
- Peroneal retinaculum
- Posterior ankle joint capsule

Following these releases, a K-wire may be inserted to maintain proper positioning of the foot. A cast is normally put in place to protect the surgical site.

In cases where deformity is persistent, osteotomies of malaligned bones is indicated. In very severe cases, an arthrodesis of the foot is performed to place the foot in a usable position.

Summary: surgical correction for CTEV is very common and takes the forms of soft tissue releases initially followed by osseous procedures for the complicated cases. Surgery is not indicated for postural clubfoot. It is nearly always corrected with casting and conservative methods of treatment.

Both Albert and Tommy were surgical cases. One cannot say that the surgery was a total success as it did not give them normal functioning feet. The addition of pedorthic treatment gave them the functionalty that they both lacked. It has improved their quality of life. The pearl here is that medial treatment and surgery have its limits, our role as pedorthists is to take up where the doctors could no longer offer help. Pedorthists can’t correct the problem, but we do make it a whole lot easier to live with it.

Fig G and H Postoperative result

[Note: Dean Mason will be conducting a program on this topic at PFA’s 54th Annual Symposium & Exhibition in Boston, October 31 – November, 2, 2013].

Resources:
US Library of Medicine, National Institutes of health: Clubfoot Repair


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