



CONFERENCE COVERAGE: International Clubfoot Symposium

The Ponseti method of clubfoot management has achieved worldwide acceptance, but practitioners and researchers are still working to identify the best ways to optimize clinical outcomes while remaining sensitive to issues of cost effectiveness and cultural differences. Clinicians from around the globe gathered in October at the second International Clubfoot Symposium to discuss their successes and challenges.



Resource-poor areas benefit from global outreach efforts

By Emily Delzell

Treatment of children with clubfoot has evolved considerably in the five years that have elapsed since the inaugural International Clubfoot Symposium, and the benefits of this evolution are particularly evident in resource-poor nations—home to about 80% of the 200,000 children born each year with clubfoot. But practitioners who treat patients in these areas still face financial, cultural, and logistical challenges.

The specific challenges vary by locale, but the potential consequences are the same in any language: If left untreated, all children born with the deformity suffer physical complications that compound problems with employment and full participation in their communities, said Frederick Dietz, MD, a pediatric orthopedic surgeon who has traveled the globe teaching the Ponseti method and has worked long-term to help establish national clubfoot care programs in Laos and Bangladesh.

“Clubfoot is an unusual disorder in the sense that the very best treatment—the Ponseti method—is also the cheapest and most compatible with low-resource countries. The caveat is that neglected clubfeet are difficult and expensive to treat, so the key is to turn off that tap so that all newborns are treated and can live productive lives in their society,” he said.

Dietz, a professor of orthopedic surgery at the University of Iowa in Iowa City, was a lead faculty member for the 2012 symposium, which was held October 3 to 5 at his home institution and hosted about 200 clubfoot practitioners.

Nariman Abol Oyoum, MD, a clinical lecturer in orthopedic surgery at Assiut University Hospital in Assiut, Egypt, came to report on the evolution of clubfoot care in her hospital from 2006, when she was basically alone in her use of the Ponseti method, to the present, when the technique is the current standard of care.

“The results of the Ponseti method speak for themselves; it took me less than a year, and perhaps



This child was treated with the Ponseti method in one of Walk for Life Bangladesh’s 35 clinics, which are located so that no patient need travel more than 37 miles (60 km) from home. (Photos courtesy of Walk for Life Bangladesh.)

three or four presentations showing results of actual clubfeet I had treated for people to change their minds and try to learn the method," she said.

At the symposium, Oyoun reported on Assiut's experience with 219 patients and 336 feet. At the final postcorrection follow-up visit 89.3% feet were rated satisfactory, defined as plantigrade, flexible, and with valgus heel and little or no dynamic forefoot adduction.

Adherence to postcorrection protocols, however, is a significant problem in Assiut, she said.

"Adequate braces are hard to come by in this area and the cost of replacing braces as babies grow is out of the economic reach of many families," she said.

Oyoun also noted issues of clinic access at her hospital, which is about 230 miles south of Cairo.

"Parents travel long distances to come to Assiut," she said. "I try my best to give patients living far away longer intervals just to keep them linked to me in a way that wouldn't put much stress on their lives. Some do comply, but some look for a local physician after feet are corrected. As a result, there is a percentage lost to follow up, but there is also a good percentage of relapses, patients who disappeared for a year or more and reappeared when the foot was 'formally and officially beyond any doubt' deformed."

The problem of transport to clinics for the follow-up care needed to prevent relapse is common among practitioners working with global outreach programs.

In Bangladesh, Dietz noted, this problem was addressed at the outset of the program, which was established in 2009 by Walk For Life (WFL) with support from the Australian Glencoe Foundation, and had the specific aim of providing Ponseti treatment to all children younger than 4 years within 60 km of their homes.

The 35 WFL clinics, which have now treated 9000 feet, also benefit from a trained pool of practitioners who are evaluated and promoted based on their proficiency with the Ponseti method, Dietz said.

"Ponseti care is the sole focus of these individuals, who are phys-



An infant in the Assiut clinic wears a brace donated from Walk For Life Bangladesh. Bangladeshi cobblers manufactured the bar with an optimal bend. (Photo courtesy of Nariman Abol Oyoun, MD.)

ical therapists," he said. "This is almost unique in my experience—in other places we might train nurses, orthotists, prosthetists, and other practitioners, but it's never their primary job."

The Bangladesh program also benefits from a robust local brace-making enterprise.

"Walk for Life arranged supplies and hired cobblers who now turn out brilliant Steenbeck braces at a cost of about four dollars," Dietz said. "They are taking their teams abroad to teach others. It can be done anywhere with a supply of leather, metal bars, and cobblers, and it can be done cheaply. But that is a problem for most new programs—to have a range of braces on the shelf so that when feet are corrected children go directly into the boots and bars."

Oyoun noted that while her patients greatly benefited from a donation of 117 Bangladeshi braces, much-needed local manufacture is still absent.

In Brazil, Monica Paschoal Nogueira, MD, PhD, an orthopedic surgeon at the Hospital do Servidor Público Estadual in São Paulo, and coordinator of the Brazilian Ponseti Clubfoot Project, also faces problems of brace acquisition, which can take anywhere from a week to six months and averages 30 days. Families dependent on social

Benefits of Ponseti method extend to older children

Clubfoot correction ideally should be performed during infancy, before children learn to walk, but experts agree that the Ponseti treatment method can also be effective in older children. Speakers at the International Clubfoot Symposium in October presented successful outcomes for Ponseti treatment of neglected clubfoot in patients aged up to 21 years.

Cases of neglected clubfoot are most prevalent in underserved areas where ambulation is essential for survival, which means not only do children learn to walk on malaligned feet but also that time spent in a cast can be more than just an inconvenience. As a result, practitioners treating older children make an extra effort to keep casting to a minimum.

"Fewer casts mean less weakness. The children are better able to get their strength back," said Julyn A. Aguilar, MD, MHA, head of the Section of Pediatric Orthopedics at St. Luke's Medical Center in Quezon City, Philippines, who reported a 100% plantigrade correction rate in 57 feet with severe or very severe clubfoot in 37 children with a mean age of 8 years. "I also ask these kids to undergo physical therapy so they can have a normal gait as quickly as possible."

Anna Ey Battle, MD, a pediatric orthopedic surgeon at Sant Joan de Déu in Barcelona, Spain, who also treats patients in India, reported using a mean of just 2.2 casts per patient in 32 patients (46 clubfeet) whose ages ranged from 3 years to 21 years. Battle, who prefers to change casts every four to five days rather than every week, achieved a mean final Pirani score of 1.1 with no relapses in her neglected clubfoot population.

Jennifer McCahill, BScPT, MPhysio, MCSP, a physiotherapist at Nuffield Orthopaedic Centre in the UK, described her group's successful use of the Ponseti method in 15 patients (19 clubfeet) aged between 2 and 15 years who had previously undergone strapping as a primary clubfoot treatment but had relapsed to the point where they were walking on the lateral edge of the foot with no apparent heel strike.

After Ponseti casting for a mean of 7.4 weeks and, in most cases, tenotomy, lengthening, or tibialis anterior tendon transfer, all patients were heel striking and mediolaterally balanced during gait. Heel varus was corrected in 13 of 16 feet and internal foot progression was corrected in 14 of 17 feet. 

—Jordana Bieze Foster



Another infant wears what Oyoun said is the “best locally made brace available” in the Assiut region in southern Egypt. She bent the bar manually when she fitted the baby with the brace. (Photo courtesy of Nariman Abol Oyoun, MD.)

services wait even longer, she said.

She also pointed out issues surrounding physician education in the duration of brace use.

“Inadequate duration of the postcorrection abduction brace is the primary factor associated with relapse, and insufficient prescription of the brace by physicians is a major barrier to compliance in southeastern Brazil,” she said.

At the symposium Nogueira presented results of a survey of 45 Brazilian orthopedic surgeons regarding brace use; 16 residents and 29 surgeons who had completed residency training responded. All had received formal training in the Ponseti method.

Only 25% of the residents prescribed the brace appropriately according to the Ponseti protocol, which calls for 23 hours of daily wear for three months followed by 12 to 14 hours of wear for two to four years. Appropriate brace use jumped to 65% among surgeons who had completed residencies; among these, 74% who attended postresidency Ponseti training correctly prescribed the brace, compared with 40% of surgeons without postresidency education.

Parent education regarding the importance of adhering to brace use is another problem encountered by Nogueira and her col-

leagues. In the Brazilian program, physicians are often the only healthcare practitioners to educate parents on proper brace use and its importance. Her study showed that physicians spent an average of only 17 minutes explaining these issues, and that only 34% of clinics in the program had any printed materials for parent education.

“Education in terms of the correct [Ponseti] protocol is key. If physicians are in doubt of the importance of the brace—that it is crucial to maintain correction—it is impossible to pass on instructions to parents in the correct way,” she said.

In Egypt, Oyoun, who lacks clinic assistants, worries that that her own efforts in that regard may be insufficient, though she says she “explains in every session the natural history, the treatment difficulties, and the false beliefs that can lead to recurrence of the deformity.” To help compensate for a lack of staff, she gives every parent her cell number for 24/7 access.

Both she and Dietz noted that a robust program, in which parents can talk to their peers at different stages of treatment and see both the successes and the consequences of not using the brace, can encourage compliance and help reduce relapses.

Pediatric orthopedic surgeon Anna Ey Batlle, MD, who presented experiences with 400 consecutive patients (1997-2009) she treated at her hospital, Sant Joan de Déu in Barcelona, Spain, noted the relapse rate in her first 100 patients was five times higher than in the last 100 babies she treated (20 vs 4, respectively).

“In the first years of the program I maintained the brace for two and a half to three years; now I maintain it for four to five years,” she said.

Her Achilles tenotomy rate has also changed dramatically, rising from 77% in the first 100 patients treated to 96% in the last 100. Her objectives with increased tenotomy were to avoid talus flattening and equinus relapse.

“The key point for a successful clubfoot program is to be absolutely strict in the Ponseti technique in every one of the steps, including manipulation, cast, braces and treatment of relapses,” Ey Batlle said. 

TATT in relapsed clubfeet can affect plantar flexion

Tibialis anterior tendon transfer (TATT) is known to be associated with limited ankle dorsiflexion, but practitioners should be aware that plantar flexion also can be negatively affected, according to research presented in October at the International Clubfoot Symposium.

TATT has been shown to improve a number of ankle kinematic variables in relapsed clubfoot patients with overactive tibialis anterior muscles, but weakening of the ankle dorsiflexors can decrease dorsiflexion range of motion. For this reason, surgeons often perform TATT with the foot in a maximally dorsiflexed position, according to John Herzenberg, MD, director of pediatric orthopedics at Sinai Hospital in Baltimore. But Herzenberg and colleagues found that this technique, in some patients, appears to have an effect on passive plantar flexion.

The Baltimore researchers analyzed 17 clubfeet in 12 patients treated with TATT at a mean age of 5 years. Overall, ankle plantar flexion at follow up (at least nine months after surgery) did differ significantly from preoperative levels. But while plantar flexion was the same or better in eight feet, nine feet demonstrated reduced plantar flexion.

“While achieving dorsiflexion is emphasized as an important

goal, it is equally important to maintain plantar flexion,” Herzenberg said.

In a separate symposium presentation, researchers from the UK reported findings that suggest patients are less likely to need a TATT procedure if their clubfoot management has been centralized at a single institution than if they have been shuttled between locations.

In 156 children (271 clubfeet) treated at a single center and 116 children (201 clubfeet) treated at multiple centers, investigators from Chelsea and Westminster Hospital in London found that the percentages of feet and patients undergoing TATT were significantly higher for those treated at multiple centers.

“A higher proportion of poor responders were referred to us by other centers,” said Alison Hulme, MBBS, a consultant pediatric orthopedic surgeon at Chelsea and Westminster Hospital.

Demographics in both groups were similar, including Pirani scores, Hulme said. But multicenter cases were more likely to be associated with prolonged casting, poorer compliance, and a later age at both presentation and correction. 

—Jordana Bieze Foster