

Abbreviated brace-wear times in clubfoot bar best outcomes

Device use till age 4 or 5 is optimal

By Katie Bell

The Ponseti method for managing idiopathic clubfoot deformity provides satisfactory results at intermediate follow-up, but the need for anterior tibial tendon transfer remains an important adjunctive treatment, according to research from the University of California, Los Angeles (UCLA). The researchers noted that, despite better understanding among clinicians of the importance of longer post-corrective brace use, adherence to the device is still not optimal.

The researchers aimed to report the contemporary outcome of the Ponseti method, which was developed at the University of Iowa in 1950, in patients with clubfoot deformity who were followed until they were 5 years or older.

Lead author Lewis E. Zions, MD, clinical professor of orthopaedics at David Geffen School of Medicine at UCLA, said, "While our study indicates that the Ponseti method has stood the test of time, further advances to our knowledge may lead to a more individualized approach in clubfoot management."

The study included families of 101 infants (73 males) diagnosed with idiopathic clubfoot from July 2006 to April 2012 and who were seen in the Orthopaedic Institute for Children in Los Angeles. The patients had no prior outside treatment and were followed until at least 5 years of age. The researchers measured clinical outcomes and assessed parental satisfaction with the Royce disease-specific instrument questionnaire.

Study clinicians manipulated participants' feet using the Ponseti method and performed heel-cord tenotomy in those with $<15^\circ$ of ankle dorsiflexion. All participants received weekly casts made with semirigid fiberglass material. After practitioners removed the last cast, they applied a Mitchell-Ponseti brace, instructing families to use the brace for 23 hours a day for three months, and then at nap time and at night.

Families were encouraged to continue bracing until children were 4 years old or until 5 years of age if they experienced a relapse during the first four years. Clinicians managed all relapses with manipulation and multiple cast applications. After correction, bracing was resumed in younger patients, while older patients' parents could choose to resume bracing or have their child undergo anterior tibial tendon transfer.

Initial correction of clubfoot deformity with the Ponseti method was achieved in all

feet. During a mean follow-up of 81.1 months, 37% of families reported adhering to the bracing protocol; the rest reported nonadherence on at least one occasion. At the time of analysis, 68% of patients had experienced one or more relapses and 38% had undergone tendon transfer. Investigators defined relapse as reappearance of any component of the clubfoot deformity necessitating further treatment.

Parent satisfaction with outcomes was generally high, with 83.2% and 75.2% reporting being "very satisfied" with foot function and appearance, respectively.

"Doctors are not spending enough time educating families about the critical importance of bracing."

— Jose Morcuende, MD, PhD

Overall, patients wore the brace until a mean age of 3.9 years (range, 1.3-5.6 years). Clinical outcomes in 62% and 38% of patient were good or fair, respectively, with no poor outcomes recorded. Patients with a good outcome wore the brace significantly longer than those who had a fair outcome.

The Journal of Bone and Joint Surgery published the study in May.

According to Zions, "Relapse rates will vary according to how aggressively the clinician chooses to manage relapses, and what resources are available to his patients. For example, had physical therapy [PT] been reliably available to our patients, I suspect some relapses could have been managed with PT and thus avoided being defined as 'relapsed.' Instead we applied a couple of casts followed by resumption of bracing, which placed them in the 'relapse' category."

An important message from the study, Zions said, is that the relapse rate will vary with duration of follow-up. "That is why intermediate-term and long-term studies are important," he said. "The relapse rates provided by Dr. Ponseti were fifty-six percent at five to twelve years, and forty-seven percent at an average of eighteen years."

Ponseti recommended night and nap-




Photo courtesy of MD Orthopaedics.

time bracing, which Zions noted is somewhat vague.

"Efforts should be made to better define the dose of treatment [ie, how many hours per day patients need to wear the brace to avoid relapse]," he said. "Good education and communication are key. It's best to discuss the importance of bracing in avoiding relapsed deformity at the first visit [even at the prenatal visit], and at each subsequent visit."

Jose A. Morcuende, MD, PhD, professor in the Department of Orthopedics and Rehabilitation at University of Iowa Health Care in Iowa City, agreed that education is key in the prevention of relapsed clubfoot deformity. He said that while most patients do not use the braces for as long as recommended, doctors are not spending enough time educating families about the critical importance of bracing.

Morcuende and colleagues reported study results in *Pediatrics* in 2004 that showed an 11% relapse rate in 157 children (256 clubfeet) treated with the Ponseti method. In that study, only four patients (2.5%) underwent anterior tibial tendon transfer to prevent further relapse.

"The most important clinical takeaway from the study is that the use of the brace is critical," Morcuende said, "and when you use it for the time that is recommended, to the age of four or five years, the number of relapses decreases dramatically." 

Katie Bell is a freelance writer in New York City.

Sources:

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