Ignacio Ponseti and the Ponseti Method of Congenital Talipes Equinovarus Correction

Club foot or, more correctly, congenital talipes equinovarus (CTEV) describes a specific foot deformity of midfoot cavus, forefoot adduction, hindfoot varus and equinus. 10 children were born with CTEV in the State of Iowa; Dr. Ponseti concluded that surgery for CTEV resulted in stiff, painful and poorly functioning feet. He developed his system of manipulation and serial casting in the late 1940s. Based on his anatomic and embryological studies of the condition, he consisted of a carefully constructed sequence of plaster casts after gentle repetitive manipulation and gradual reduction of the malaligned joints. Many had tried casting with limited success, but Ponseti's understanding of the complex interrelationship of the talars bone led to his system becoming a successful system. In 1984, at the age of 71, he retired briefly, but subsequently returned to focus solely on his CTEV practice. The University awarded him an honorary Doctor of Humanities Letters degree in 2007. Despite a hip fracture in January 2009 at the age of 94 he fully recovered and returned to work. Dr. Ponseti was at his office desk at the age of 95 when he suffered a stroke, and he died four days later. 

The Ponseti Method is a system of treatment for CTEV in babies that stretches the ligaments rather than surgery, manipulating the foot into the optimum shape by hand, casts and braces. It avoids cutting tight ligaments, joint capsules and tendons and makes use of the biomechanics of stress relaxation of collagen. “It’s a simple technique based on the understanding of the mechanics of how the joints move,” Ponseti said. “Nature has provided us with a great gift. When cutting ligaments and joint capsules, you destroy nature’s way of bringing about normal foot motion.”

The foot is manipulated for about a minute, after which an above-knee plaster cast is applied. This cast is typically changed weekly for 4-8 weeks, depending on the severity and rigidity of the deformity. The first cast is used to align the forefoot with the hindfoot by correcting excessive adduction. Subsequent casts maintain the foot in a position of supination and plantarflexion as the forefoot adduction is corrected. Then the foot is abducted using the thumb pressed against the lateral aspect of head of talus as the foot is supinated. As the adduction is corrected, the foot is internally rotated. This position is maintained until the cast is changed. The foot is then manipulated for a minute, after which an above-knee plaster cast is applied. This cast is typically changed weekly for 4-8 weeks, depending on the severity and rigidity of the deformity.

The rate of relapse after three years is 10 percent. For a mild relapse below the age of 2, repeat serial casting is used followed by the FAO. After age 2 years, repeat casting is used to optimize the foot prior to transfer of this tilialis anterior tendon to the lateral column cuneiform. Repeated tendoachilles lengthening may be performed. Dr. Ponseti's method of abduction orthosis (FAO) such as the Denis Browne boots and bar are used to maintain external rotation of 70 degrees on the affected side and 45 degrees on the normal side. The FAO is worn for 24 hours a day until the child can walk. The foot abduction orthosis (FAO) such as the Denis Browne boots and bar are used to maintain external rotation of 70 degrees on the affected side and 45 degrees on the normal side. The FAO is worn for 24 hours a day until the child can walk.

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In 1995, Cooper and Dietz published their excellent long term results with this method. It works best when started at birth, when ligaments and muscles are flexible. The mild form rarely requires surgery, while the severe teratological variety invariably requires surgery. In such cases, the Ponseti method tends to reduce the extent of surgery required.

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References
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