The Ponseti Method to Treat Club Foot

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Ignacio Vives Ponseti developed a noninvasive method for treating congenital club foot in the US during the late 1940s. Congenital club foot is a deformity that affects the tissues in the lower leg and foot such that the foot abnormally turns inwards and upwards. Ponseti developed the method after noting that an affected infant's tissues are malleable and could respond to gentle correction instead of the surgeries that surgeons used to treat club foot at the time. The Ponseti method consists of a series of manual manipulations followed by setting the affected foot in a cast to gradually realign the foot. The Ponseti method became widely-used in the 1990s as doctors and families of affected infants gained interest in effective, nonsurgical treatments for club-foot. By the twenty-first century, orthopedists worldwide used the Ponseti method to treat infants and children born with club-foot to normalize their foot abnormality so that they grow without disability.

In 1941, while studying skeletal tissues at the University of Iowa in Iowa City, Iowa, Ponseti notes some shortcomings in treatments then available for club foot. At the time, Ponseti was an orthopedic physician at the University of Iowa in Iowa City, Iowa. He studied nonsurgical treatment options to correct skeletal deformities early in his career, although most physicians assumed that cutting bone was the optimal treatment method for all patients with serious deformities. Shortly after arriving in Iowa, Ponseti’s mentor assigned him a project that required Ponseti to review the initial and follow-up results of club foot surgeries performed twenty years prior. Ponseti found that many individuals who had undergone surgery had feet that developed unfavorably despite the procedures. Most patients experienced stiffness, pain, and difficulty walking or even moving their feet. Ponseti noted that an infant's tissues are malleable enough to stretch and realign more favorably with proper guidance.

The Ponseti method consists of cycles of manual manipulations and casting, tendon adjustment procedures when necessary, then a home splinting regimen. The physician first assesses the affected foot, as each case is unique in its degree of rigidity and deformity, and each treatment plan differs. The physician uses his or her hands to push and stretch the affected foot outwards and upwards toward a normal position. After stretching the foot's tissues, the physician uses plaster casts to hold the foot in place as it heals and continues to develop. The infant wears the cast, which typically spans from the toes to the groin of the affected leg, for about one week. Then the physician removes the cast and repeats the process of manual manipulation and casting until the foot rests in a more favorable position, which takes about one month. If the foot resists stretching, the physician may perform a minor procedure to divide and lengthen one or more tendons in the foot to reduce the strain against the stretching foot tissues. Following the manipulations, castings, and minor surgeries when necessary, the infant must wear a special splint on the affected foot for at least two months and then while sleeping for several more months.

The Ponseti method has a high success rate for treating moderate to severe cases of congenital club foot. Studies have reported an average of eighty-five percent of infants obtain corrected feet without needing additional surgeries. Cases in which the Ponseti method proved ineffective usually involved exceptionally severe congenital deformity, insufficient cycles of manipulations and casting, or noncompliance with the at-home splinting regimen. Patients also experienced better treatments when physicians applied the Ponseti method as early in life as possible, often within the first week of life.

Although Ponseti and his fellow orthopedic physicians began practicing the Ponseti method in the middle of the twentieth century, other orthopedic physicians did not immediately adopt Ponseti’s technique. The prevailing method for treating the deformity prior to the emergence of the Ponseti method involved surgeries in which physicians removed sections of bone from the infant's foot. Although the infants who received invasive treatments often remained afflicted with discomfort and pain into adulthood, surgeons continued to rely on the procedures they learned in medical school.

As Ponseti continued to practice his method, his patients’ families and his colleagues began publicizing the efficacy of the Ponseti method. Some families of affected infants and children searched for treatments with less surgeries and better outcomes. In 1995, Ponseti published Congenital Clubfoot: Fundamentals of Treatment, which contributed to the spread of the Ponseti method globally. Families traveled to Iowa with their affected infants to receive the Ponseti method for treatment, and physicians studied with Ponseti to learn the method and to use it in their own practices.

By 2014, a majority of countries reported using the Ponseti method for congenital club foot treatment, and the method had become a primary treatment method for club foot. The method made the treatment of clubfoot more accessible in many countries because it is inexpensive and does not require an orthopedic surgeon. The Ponseti method also helped physicians and medical scientists to explain how the skeletal system develops and responds to noninvasive treatments. The method demonstrated how
the malleable tissues in an infant's skeletal system respond to external pressures and can be permanently realigned when the tissues are targeted early and consistently. Using the principles of the Ponseti method, physicians developed treatments for infants with a variety of congenital skeletal disorders.

Sources


Ignacio Vives Ponseti developed a noninvasive method for treating congenital club foot in the US during the late 1940s. Congenital club foot is a birth deformity in which one or both of an infant's feet are rotated inward beneath the ankle, making normal movement rigid and painful. Ponseti developed a treatment method, later called the Ponseti method, that consisted of a series of manipulations and castings of the club foot performed in the first few months of life. The Ponseti method provided a non-surgical treatment that generally resulted in better long-term outcomes than the surgical procedures that doctors used prior to his work. Ponseti's method for treating congenital club foot improved the quality of life for patients born with the deformity, and his work led researchers to study fetal foot tissues.

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