

Case Report

Inveterate adult congenital clubfoot in a patient with myelomeningocele and the Ponseti method as a choice: case report

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Abstract

The Ponseti method is currently considered the gold standard for treating congenital clubfoot, including in syndromic cases such as myelomeningocele. Its indication in neglected cases is well established in children and adolescents but remains uncertain in adult patients. We present a clinical case of a 27-year-old female patient with myelomeningocele and neglected clubfoot who was treated for the first time at this age with the Ponseti method, with good results. In developing countries, we often encounter adult patients with congenital club feet who have not had access to health care. Although the age limit to institute the Ponseti method as a therapeutic option is still unclear, it is an inexpensive, safe, accessible, and plausible option with satisfactory results even in adult, neglected, and syndromic cases.

Level of Evidence V; Diagnostic Studies; Expert Opinion.

Keywords: Clubfoot; Meningomyelocele; Manipulation, orthopedic; Ponseti technique.

Introduction

The Ponseti method⁽¹⁾, characterized by a gradual and progressive correction of the feet based on manipulation, serial casting, and percutaneous Achilles tenotomy, is currently considered the gold standard for treating congenital clubfoot. This method is also described as effective in cases of syndromic clubfeet, such as arthrogryposis and myelomeningocele⁽²⁾.

The treatment of congenital neglected clubfoot in children and adolescents through the Ponseti method is well described in the literature⁽³⁾, but the best management strategy in adult patients remains uncertain.

With this report, we aim to demonstrate a unique case of therapeutic success regarding a 27-year-old patient with myelomeningocele and neglected congenital clubfoot who was treated for the first time at this age with the Ponseti method, achieving good results.

Case description

This work was approved by the Research Ethics Committee linked to the institution's Plataforma Brasil.

We report a case of a female patient, aged 27 years, who has lower lumbar myelomeningocele and congenital clubfeet that had never been treated; she reached the health unit complaining of foot deformity, gait difficulty, and chronic cutaneous injuries on her feet that frequently turned acute.

During clinical examination, at inspection, we noticed a severe deformity of the feet characterized by ankle equinus, hindfoot varus, midfoot adductus, and severe forefoot cavus. Moreover, there were 3 pressure ulcers on the right foot, with no signs of infection at the moment. Regarding gait, patient ambulation happened with a walker, using the dorsal region of the feet for support. At palpation, no pain due to neuropathy was observed. As for mobility, important stiffness was noticed in all deformed segments of the feet, where the right

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side was stiffer than the left side. Vascular examination yielded normal results. A neurological examination demonstrated foot insensitivity and M0 motor function in all muscles going through the feet and ankles (Figure 1).

The patient underwent laboratory examinations to exclude inflammatory/infectious activity in the ulcers, with normal blood count, C-reactive protein (CRP), and erythrocyte sedimentation rate (ESR). She was also subjected to radiographs of the feet and ankles, demonstrating alterations that were compatible with bilateral cavus-adductus-varus-equinus feet, bone dysplasia, and no signs of osteomyelitis (Figure 2).

Considering the diagnosis of inveterate adult congenital neurological clubfoot, after a long conversation with the patient we proposed an attempt at a non-surgical treatment based on manipulation, serial casting, and Achilles tenotomy, as proposed by Ponseti⁽¹⁾.



Figure 1. Examination of the feet with and without weight bearing.



Figure 2. Anteroposterior (AP) radiograph of the ankles projecting the feet.

In May 2021, we initiated treatment according to the Ponseti method⁽¹⁾. After the fifth cast, on the right side, we noticed signs of inflammation and drainage with fetid odor on the pressure ulcers when the patient underwent magnetic resonance on this side, with signs of soft tissue infection but not of bone involvement. We removed the cast and performed thorough debridement of the ulcers; samples sent for culture showed bacterial growth (*Acinetobacter*) on soft tissue fragments but not on the bone biopsy. The antibiogram indicated sensitivity to ciprofloxacin, and the patient used this medication for 2 weeks (intravenously for 1 week, under hospitalization, and orally for 1 week at home). During this period, a new cast was made, with openings around the ulcers for daily dressing changes. The ulcers healed completely in 2 weeks.

The correction of deformities happened progressively: with 12 serial castings on the left side and 15 on the right side, we obtained satisfactory correction of the cavus, adductus, and varus deformities, with bilateral 30-degree abduction and persistence of the equinus deformity; percutaneous Achilles tenotomy was then performed. Tenotomy was performed under local anesthesia, with only 1 cutaneous suture (Figure 3). After tenotomy, the patient remained with the cast for 3 consecutive weeks in maximum ankle dorsiflexion (Figure 4).

At 3-week follow-up after tenotomy, once the cast was removed, we noticed satisfactory correction of deformities and complete healing of the pressure ulcers. The feet were plantigrade and able to adjust to an ankle-foot orthosis (AFO) (Figure 5). At 2-month follow-up, the patient reported she was satisfied with the deformity correction, with satisfactory improvement in gait, healing of the ulcers, and a possibility of using conventional closed-toe shoes with good adjustment to the orthosis. She brought new radiographs of the feet and ankles (Figure 6).



Figure 3. Serial casting: first, third, fifth, seventh, ninth, and eleventh casts.



Figure 4. Maximum dorsiflexion of the right ankle after percutaneous Achilles tenotomy.



Figure 5. Corrected plantigrade feet adjusted to the ankle-foot orthosis (AFO).



Figure 6. AP radiograph of the feet and profile view of the feet and ankles after correction.

Discussion

Recent evidence suggests that the Ponseti method is appropriate for older patients, although the age limit for this technique is still not well established⁽³⁾. In neglected cases, the most frequently performed treatment in the present day is surgery, varying from extensive soft tissue release to complex corrections using external fixators, corrective osteotomies, and triple arthrodesis⁽⁴⁾. However, all these techniques are complex, expensive, and have high complication rates.

Lourenço and Morcuende⁽⁵⁾ studied 24 neglected clubfeet in patients aged 1–9 years. They used the Ponseti method with minimal modifications. One of them was the duration of manipulation in each session, varying from 5 to 10 min; this differed from the shorter time used with smaller children. This longer manipulation period allowed a more effective stretching of soft tissues, which are less elastic. In our case report, considering an adult patient with no previous treatment, we also used longer manipulation periods in each session for achieving increased stretching of soft tissues.

In the same study by Lourenço and Morcuende⁽⁵⁾, casts were changed every 2 weeks, as opposed to the weekly method originally proposed by Ponseti, in order to provide more time for remodeling in neglected cases. In this case report, however, weekly cast changes were maintained because neuropathic feet may present blisters and ulcers, thus a shorter interval between cast changes was defined. Weekly cast changes were also reported by Khan and Kumar⁽⁶⁾ and Haje⁽⁷⁾.

Due to 2 well-established reasons (neglected and syndromic feet), the number of casts used in this case was larger than that described by Ponseti. In a study by Gerlach et al.⁽⁸⁾,

which assessed the Ponseti method in clubfeet of patients with myelomeningocele, one of the reported differences was the larger number of casts when compared with idiopathic cases. A study by Sinha et al.⁽⁹⁾ also reported a higher number of casts for achieving maximum correction in neglected cases when they treated 30 patients aged 1-10 years. They observed that the older the patient, the larger the number of casts required. These findings are in accordance with our report, where we treated a neglected and syndromic case and required more casts for obtaining maximum correction: 12 for the left foot and 15 for the right foot.

Another noteworthy finding is the maximum abduction achieved by these neglected feet before percutaneous Achilles tenotomy. In studies by Sinha et al.⁽⁹⁾ and Lourenço and Morcuende⁽⁵⁾, patients achieved up to 40 degrees of foot abduction, unlike the 70 degrees of abduction originally described by Ponseti. This limitation in abduction was also noticed in this report: when patients reached 30 degrees of abduction (maximal value), we performed percutaneous Achilles tenotomy.

Regarding the type of orthosis prescribed after the 3 weeks following Achilles tenotomy, whether a Dennis Browne foot abduction orthosis or a rigid AFO, the literature presents no consensus when considering syndromic and neglected cases. In studies by Sinha et al.⁽⁹⁾, Khan and Kumar⁽⁶⁾, and a report by Haje⁽⁷⁾, the abduction orthosis was chosen in protocols des-


cribed by Ponseti. In the study by Lourenço and Morcuende⁽⁵⁾, however, an AFO was recommended, since although blisters and ulcers may happen in idiopathic and non-idiopathic clubfeet, patients with myelomeningocele have higher chances of problems due to their sensory deficit⁽⁹⁾.

According to a systematic review published in 2017 by Digge et al.⁽³⁾, some aspects should be better elucidated for clearly defining the age limit for successfully applying the Ponseti method: larger studies with longer follow-up, well-established inclusion and exclusion criteria, clarity when describing modifications in the technique, type of cast (long or short), cast duration, tenotomy vs stretching of the Achilles, and type of orthosis used.

Although our follow-up was short, the main goal of this report is to state that an adult with neglected congenital syndromic clubfoot may be treated with a non-surgical alternative such as the Ponseti method, reaching satisfactory results.

Conclusion

In developing countries, we frequently find adult patients with congenital clubfeet that have not had access to treatment. Although the age limit for instituting the Ponseti method as therapeutic option is still obscure, this is an inexpensive, safe, and accessible option that could achieve satisfactory results even in adult, neglected, and syndromic cases.

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