

Ponseti method for late presentation of clubfoot

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Dear Editor,

We read with much interest the review article on clubfoot treatment with the Ponseti method by Radler [1]. The Ponseti method has found most use in developing countries where late presentation of clubfoot is also fairly common. Several papers now routinely recommend this technique up to two years of age and depict success rates almost equivalent to infants [2–9]. We would like to broaden the review to include clubfoot treatment by Ponseti method in older children with late presentation and raise some issues related to this extended use.

A review of studies using the Ponseti technique for clubfoot in children over two years of age and their outcome is presented in Table 1. An interesting observation which has emerged from these studies is that the number of casts correlates poorly with increasing age. Spiegel et al. postulated that clubfeet in older child may be more supple as a result of weight bearing forces or other factors [4].

With use of the Ponseti technique in older children, several new challenges have emerged. Initial severity scoring applicable in infants is problematic as there are no empty heel signs, distinct medial and posterior creases in walking children [4]. The Ponseti technique has also been adapted for older children. Manipulation time is increased, lesser foot abduction and dorsiflexion are acceptable, knee flexion in an above knee cast is decreased, cast duration is extended, different casting material is proposed, increased cast duration post tenotomy for tendo Achilles healing and an

altered brace regime is suggested (Table 1). The surgical intervention has increased beyond percutaneous tenotomy with open Achilles tendon lengthening and posterior release added as modifications of the Ponseti technique in older children [4, 9]. Some series recommend an additional split tibialis anterior transfer at the time of equinus correction to tide over the brace compliance problem, while others do not recommend it [3]. An early and higher recurrence rate is documented in several series (29 % [3]; 23 % [8]; 19 % [5]; 24 % [7]). A total failure of treatment with the Ponseti technique in late presentation is also reported by observers (33.33 % [3]; 7.27 % [8]; 14.3 % [7]). Complications such as prolonged bleeding, erythema, swelling, redness of the skin due to excessive pressure, osteopenia, wound dehiscence, etc. are also described [2, 4]. Parents need more counselling as there is often little progress in the first three to four casts, a walking child becomes non-ambulatory for several months and requires supportive care of parents for daily activities, there is increased need for supplementary operations and brace compliance is difficult.

Several questions regarding these adaptations of the Ponseti technique remain unanswered. Foremost is upper age limit for the technique. The oldest patient on record treated with this method is probably an 18-year-old girl with unilateral club foot [6]. Other important investigational issues are appropriate severity grading, ideal abduction and dorsiflexion definitions to prevent early recurrences, upper age limit for percutaneous tenotomy (up to ten years is reported), most appropriate technique for equinus correction in older children, definition of corrected foot and parameters of appropriate functional outcome and bracing. The preventive health care strengthening to reduce the number of neglected cases also remains a big challenge.

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Table 1 Studies using the Ponseti technique for clubfoot in children > 2 years: success rate and relation with age

Authors	Patient profile	Technique characteristics	Success rate ^a	Relation with age
Tindall et al. (2005) [2]	< 18 months: 50 > 18–48 months: 25	Only Ponseti manipulations 57/100 feet	98 %	Average 5.3 casts
Laoueno and Morcuende (2007) [3]	1.2–9 years: 17 (24 feet)	Ponseti manipulations with tenotomy 41/100 feet Foot abduction up to 30–40 degree, cast change every 2 weeks, ankle foot orthosis instead of abduction orthosis for 11.7 months, last cast for 5 weeks to allow healing of tendoachilles, manipulations for 5–10 minutes, percutaneous tenotomy all cases	–	Average 9 casts (range 7–12)
Spiegel et al. (2009) [4]	1–6 years : 171 (260 feet) 1–2 years: 128 feet 2–3 years : 74 feet 3–4 years: 21 feet 4–5 years: 18 feet 5–6 years: 19 feet	79 % percutaneous release 3 % open TAL 8 % posterior release	94 % (3 years: 100 %; 4 years: 78 %; 5 years: 100 %)	Average 7 casts (range 4–14), no difference between ages
Wang et al. (2009) [5]	Group I 6–12 months: 81 (113 feet) Group II 1–3 years: 52 (78 feet) Group III > 3 years: 24 (36 feet) < 24 months: 40/55 > 24–360 months: 15/55	Casts changed once every 2–3 weeks for groups I and II, foot abduction 20–30 degrees, use of polyester cast, percutaneous tenotomy only in 62 feet (27.31 %) Knee flexed 110–120 degrees, cast changed every 2 weeks, foot abduction up to 30–40 degrees, manipulations lasted 10–15 minutes No surgery (52/55) 94.5 % Minor surgery (3/ 55) 5.5 % Percutaneous tenotomy all cases	Overall 96.2 % Group I: 99.12 % Group II: 98.72 % Group III: 86.11 % 96.4 %	Average casts in group II: 3.87 Average casts in group III: 3.13 Number of casts applied were not related to patients age (p>0.159)
Khan and Kumar (2010) [7]	7.5–11.1 years: 21 (25 feet)	Percutaneous tenotomy all cases	85.7 %	Average 12.1 (10–14) casts
Verma et al. (2011) [8]	< 2 years: 16 (18 feet) > 2–3 years: 21 (37 feet)	Tenotomy required 21/37 feet in children > 2 years	89.2 % in age group 2–3 years	Average 8 casts (range 6–10) in age < 2 years; 11 casts (range 9–12) in age 2–3 years
Yagmurlu et al. (2011) [9]	< 20 months: 14 (16 feet) > 20 months (range 21–72 months): 13 (15 feet)	Average time for cast renewal in > 20 months group 8.5 days (7–10 days), 14 percutaneous releases, 17 open TAL	Statistically significant improvement in Dimeglio scores (varus, medial rotation of carpedal block, adductus)	Average 6 (range 4–8) casts

^a The comparison criteria was not uniform
TAL tendoachilles lengthening

References

1. Radler C (2013) The Ponseti method for the treatment of congenital club foot: review of the current literature and treatment recommendations. *Int Orthop* 37:1747–1753
2. Tindall AJ, Steinlechner CW, Lavy CB, Mannion S, Mkandawire N (2005) Results of manipulation of idiopathic clubfoot deformity in Malawi by orthopaedic clinical officers using the Ponseti method: a realistic alternative for the developing world? *J Pediatr Orthop* 25: 627–629
3. Lourenço AF, Morcuende JA (2007) Correction of neglected idiopathic club foot by the Ponseti method. *J Bone Joint Surg Br* 89:378–381
4. Spiegel DA, Shrestha OP, Sitoula P, Rajbhandary T, Bijukachhe B, Banskota AK (2009) Ponseti method for untreated idiopathic clubfeet in Nepalese patients from 1 to 6 years of age. *Clin Orthop Relat Res* 467:1164–1170
5. Wang YZ, Wang XW, Zhang P, Wang XS (2009) Application of Ponseti method in patients older than 6 months with congenital talipes equinovarus. *Beijing Da Xue Xue Bao* 41:452–455
6. Adegbehingbe OO, Oginni LM, Ogundele OJ, Ariyibi AL, Abiola PO, Ojo OD (2010) Ponseti clubfoot management: changing surgical trends in Nigeria. *Iowa Orthop J* 30:7–14
7. Khan SA, Kumar A (2010) Ponseti's manipulation in neglected clubfoot in children more than 7 years of age: a prospective evaluation of 25 feet with long-term follow-up. *J Pediatr Orthop B* 19:385–389
8. Verma A, Mehtani A, Sural S, Maini L, Gautam VK, Basran SS et al (2012) Management of idiopathic clubfoot in toddlers by Ponseti's method. *J Pediatr Orthop B* 21:79–84
9. Yagmurlu MF, Ermis MN, Akdeniz HE, Kesin E, Karakas ES (2011) Ponseti management of clubfoot after walking age. *Pediatr Int* 53:85–89