

What is the appropriate evaluation and treatment of children who are “toe walkers”?

EVIDENCE-BASED ANSWER

The evaluation of toe-walking focuses on differentiating normal children from those with mild cerebral palsy. Gait analysis may be a useful diagnostic tool, but further investigation is needed to confirm its reliability (strength of recommendation

[SOR]: **C**, based on case series).

Observation alone is generally as successful as serial casting and surgery in decreasing the frequency of toe-walking at follow-up (SOR: **C**, based on case series).

CLINICAL COMMENTARY

Avoid overmedicalizing a problem that appears to run a benign course

The challenge with idiopathic toe-walking appears to be how to discriminate it from the more serious entities of cerebral palsy and muscular dystrophy. Idiopathic toe-walking should be evident in an otherwise healthy child as he or she begins to walk. It should be bilateral, there should be no spasticity and reflexes should not be overly brisk. A few follow-up visits at 3- or 6-month intervals should reassure all that this

problem is nonprogressive. I have seen many toe-walking children over the years but no toe-walking adults without cerebral palsy or muscular dystrophy. This seems to confirm this review's findings that observation appears to be as useful as casting or surgery. Until there is a natural history study of toe-walking, we need to be watchful to not overmedicalize a problem that appears to run a benign course.

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Evidence summary

Idiopathic toe-walking is a childhood condition of unknown cause characterized by persistence of a tiptoe gait pattern without evidence of neurologic, orthopedic, or psychiatric disease.¹ The incidence in the general population is not known. Children with idiopathic toe-walking usually have limited ankle dorsiflexion and are able to walk with a heel-strike for short periods when asked to do so. Longitudinal data is lacking to determine whether ankle equi-

nus is the primary cause of idiopathic toe-walking or is a consequence of chronically walking on tiptoes. A family history of toe-walking ranges from 30% to 71% in the literature and is considered a characteristic of idiopathic toe walking.²⁻⁴

Evaluation. An important element of the evaluation of idiopathic toe-walking is to distinguish it from neuromuscular disorders associated with toe-walking, such as mild cerebral palsy. Case series with small numbers of subjects (range=27-41)

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FAST TRACK

There is no convincing evidence that any treatment is necessary for toe-walking

have used gait electromyography (EMG) to distinguish cerebral palsy from idiopathic toe-walking.^{4,6} The overlap in gait EMG values in cerebral palsy and idiopathic toe-walking precludes its use as a differentiating diagnostic test.

The only aspect of EMG testing that has been useful in differentiating cerebral palsy from idiopathic toe-walking is gastrocnemius coactivation during resisted knee extension—a finding indicative of neurologic pathology.^{5,6} Kinematic analysis and observation of gait and measurement of ankle range of motion have been studied as diagnostic tools to differentiate idiopathic toe-walking from cerebral palsy.⁵⁻⁸ In the largest of these 4 studies (23 children with mild cerebral palsy and 22 with idiopathic toe-walking), maximal knee extension occurred at ground contact in the idiopathic toe-walking group whereas in the mild cerebral palsy group, the knee was flexed at ground contact.⁷ Measurement of ankle range of motion is not reliable in distinguishing between idiopathic toe-walking and cerebral palsy groups.⁵⁻⁷

Treatment. Simple observation, physical therapy, serial casting, and Achilles tendon lengthening surgery have been studied in the treatment of idiopathic toe-walking.^{2,3,9-11} In the largest case series (n=136),¹⁰ the frequency of toe-walking decreased in 51% of those in both the observation and casted groups. In this same study, the surgical group had lower rates of toe-walking, but no direct comparisons could be made to the nonsurgical groups because the patients in the surgical group were older and had longer follow-up than the other groups.

In a retrospective comparison³ of observation (which included physical therapy and special shoes), casting, and surgery among 80 children with idiopathic toe-walking, surgery resulted in significantly higher parental satisfaction (satisfied was defined as “child rarely walks on tiptoe”), 67% vs 25% and 24% for observation and casting groups respectively ($P < .05$). Three smaller studies (from

13 to 18 subjects) also showed decreased toe-walking at follow-up, regardless of treatment.^{2,9,11}

There is no convincing evidence that treatment is necessary for this condition. We found no randomized trials of treatment for idiopathic toe-walking and no follow-up studies of sufficient size and duration that evaluate long-term effects of toe walking on the patient later in life.

Recommendations from others

No recommendations or guidelines were found.

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