

ANOTHER USE FOR A STANDING ORTHOSIS

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This paper describes how a standing orthosis with a pivot walker attachment was used to assist a child with bilateral fibular centralizations and ankle disarticulations due to bilateral longitudinal deficiencies of the tibia.

PATIENT HISTORY

M.L. is a three-year-old black girl born with bilateral longitudinal deficiencies of the tibia. At four months of age, she had bilateral fibular centralizations of the knee (Brown procedure) (1) and bilateral ankle disarticulations of her deformed feet. She has flexion contractures of the knees (right, 20 deg.; left, 40 deg.); weak hip musculature; and ranges of motion of the hips as follows: abduction, 90 deg.; flexion, 125 deg.; extension 0 deg.; external rotation, 90 deg.; internal rotation, 0 deg.

PROSTHETIC TREATMENT

Initially, at about age two, she was fitted with bilateral Symes prostheses with hip joints and pelvic band. Her use of these prostheses was only part-time and were not successful in providing mobility.

Subsequently, she was fitted as shown in Figures 1 and 2. The intention was to provide knee stability and weight-bearing with the prostheses and to allow her to use and strengthen her hip musculature. However, because she had been sitting for most of her three years, her hip muscles were quite weak, and she could not stand without support.



Fig. 1. M.L. with bilateral Symes prostheses.

USE OF STANDING ORTHOSIS

One possibility to allow her to gain mobility would have been to revert to use of hip joints and pelvic band. Instead, we chose to provide a standing orthosis as shown in Figures 3-5. The pivot walker attachment (3) was used to increase her mobility.

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Fig. 2. Symes prostheses showing knee flexion contractures.

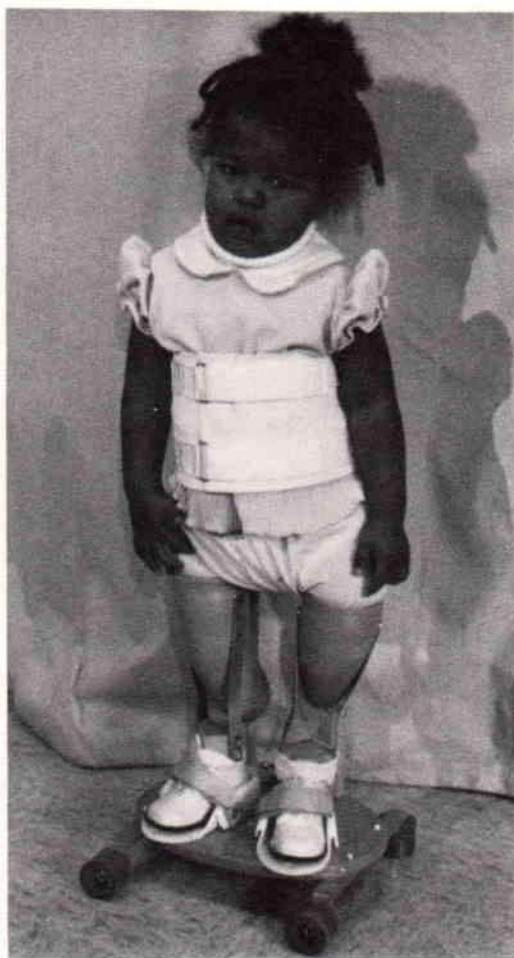


Fig. 3. M.L. with prostheses and standing orthosis.

The goal is to give her enough support to stand, and at the same time encourage the use of her own hip musculature. Once her muscles are strong enough, the plan is to discard the standing orthosis, and have her use only the prostheses, perhaps with a tie-bar (2), for ambulation.

In the meantime, the standing orthosis provides a good way of giving hip and trunk support as necessary and controlling external rotation of the hips without modification of the prostheses.

Her therapists² report she is now wearing the prostheses and standing frame at school and at home, and is using the pivot walker around the classroom and outside on the playground. She puts it on and takes it off independently, and is practicing falling to the floor.

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Fig. 4. Standing orthosis showing A-P alignment.



Fig. 5. Standing orthosis showing M-L alignment and elastic trunk support.

The long range plan for this girl is to reduce her knee flexion contractures as much as possible by manual stretching, complete the correction surgically, and re-fit with prostheses.

REFERENCES

1. Brown, F. W., *Construction of a knee joint in congenital total absence of the tibia (paraxial hemimelia*
2. McLaurin, Colin A., *1971 research report, Rehabilitation Engineering, Ontario Crippled Children's Centre, Toronto, Ontario M4G-1R8, Canada*
3. Motloch, Wallace M., *1970 research report, Rehabilitation Engineering, Ontario Crippled Children's Centre, Toronto, Ontario M4G-1R8, Canada*

tibia), *Journal of Bone & Joint Surgery*, 47-A:4:695-704, June, 1965.