Pilot case study on the Exoband orthosis to assist with hip flexion during gait in a patient with MS

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Introduction

▪Hip flexor weakness is a common symptom of MS. It results in the inability to step, increased energy cost of walking, reduced walking speed and reduced stride length. This has been shown to reduce quality of life, health status and life expectancy (Panizzolo et al, 2021)
▪While a large variety of orthotic devices exist to assist with reduced dorsiflexion, this is not the case for hip flexion assistive devices.
▪The Exoband is an orthosis designed to improve hip flexion and reduce energy cost during gait that has shown some promising results with patients with MS in a recent clinical trial (Liguori et al, 2024).

Aim: We piloted the Exoband on a single patient to determine its potential effectiveness for patients diagnosed with MS with hip flexor weakness limiting their gait.

Exoband

Treatment

Exoband and 6 weeks of physio including strengthening of hip extensors, abductors and flexors.
Ongoing HEP issued and outcomes repeated at the 6-month review.

Patient Details

- 47 y/o Male
- MS diagnosed 2015
- Occupation: Factory line-manager
- hip strength: 2/5
- Mobilises with 1 crutch
- Unable to extend hip actively in sitting due to spasticity

Main issues:
1. unable to lift leg into work vehicle
2. Increased falls
3. effortful stepping of left leg
4. Increased Left hip pain
5. Slow walking speed

Other Splints Trialled:

Serial Cast

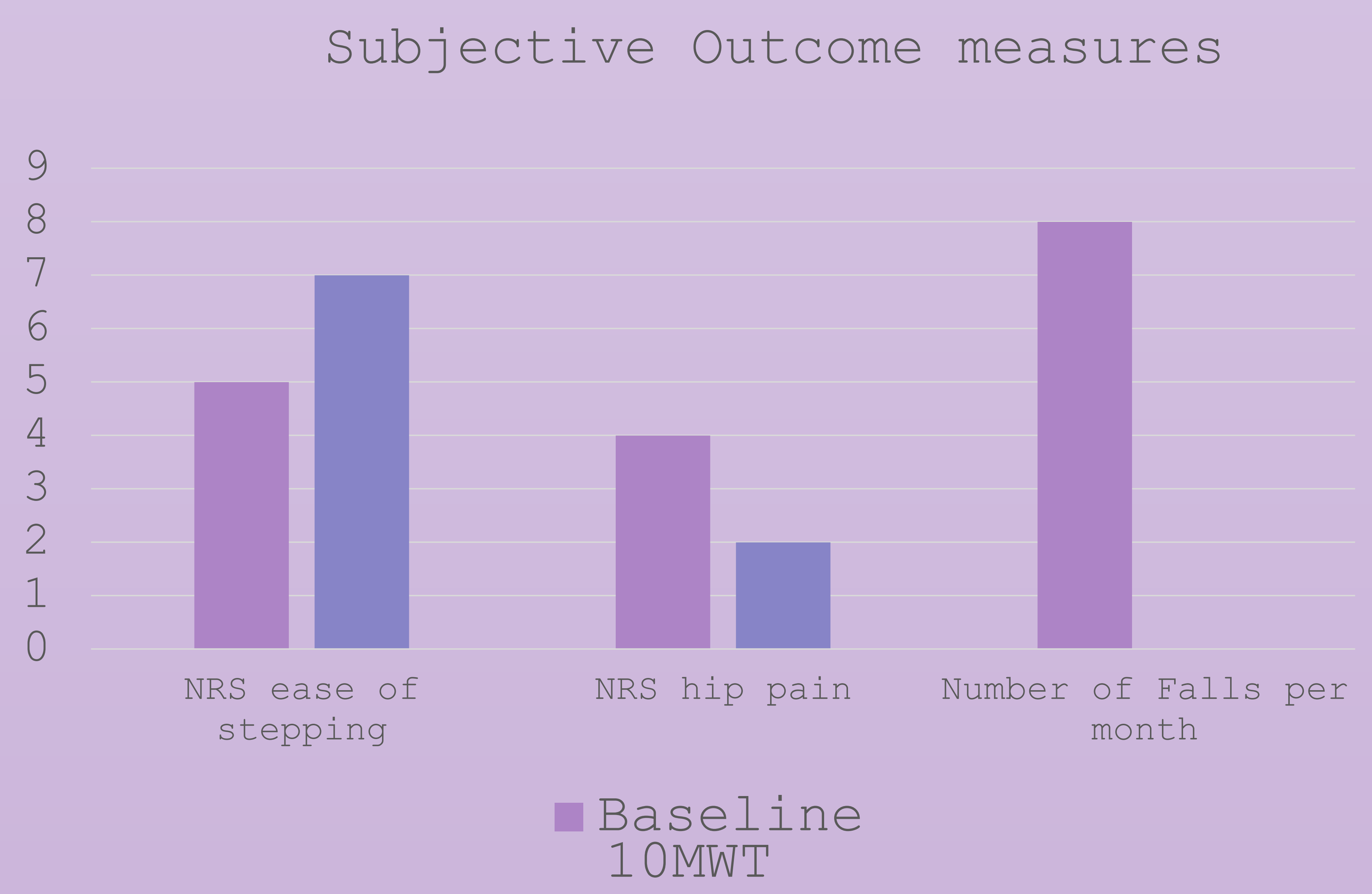
'Step On' AFO

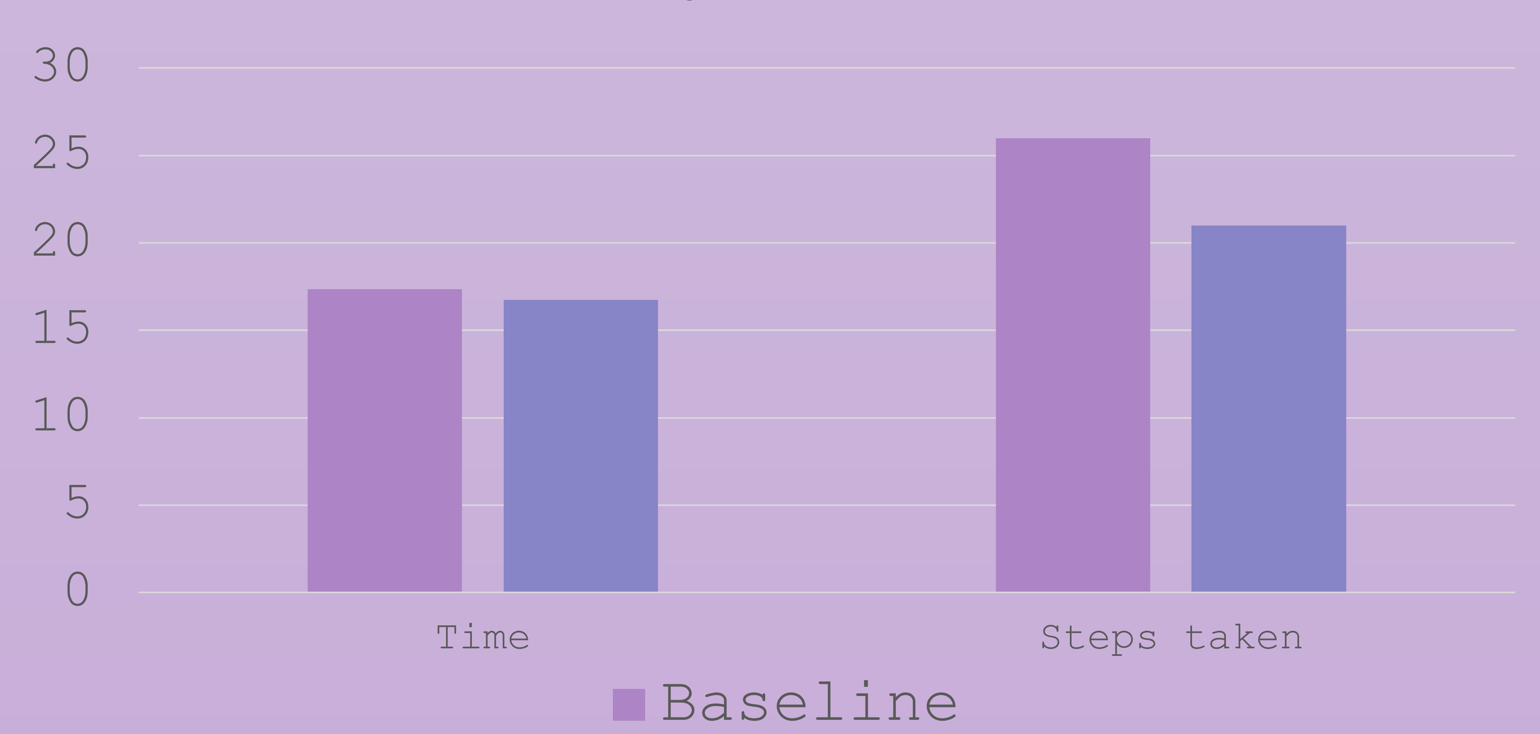
FES

Outcome measures

- NRS ease of stepping
- NRS hip pain
- number of falls
- 10MWT

Results





- After 6 month review the patient used the Exoband 3-4 times a week as an exercise tool for ongoing maintenance of mobility.

Conclusion

The Exoband may be a beneficial orthotic device to assist with hip flexion weakness in patients with MS, especially when combined with physiotherapy input.
Would require more patient cases and comparison with Exoband + physio, Exoband + no physio and just physio.

References:

1. Liguori, S., Panizzolo, F. A., Marcolin, G., Micaglio, G., Mendicino, M., Semplicini, C., Baricich, A., Molteni, F., Guanziroli, E., Ciotti, S., Zampolini, M., Castelli, E., Gervasoni, F., Campagnoli, M., Quercio, M and Gimihliano, F. (2024) 'User experience of passive hip flexion device in people with multiple sclerosis: Exploring improvements and overcoming barriers', *Journal of the International Society of Physical and Rehabilitation Medicine, 7(3), pp. 92-98.*

2.Panizzolo, F.A., Annese, E. A., Paoli, A. and Marcolin, G. (2021) 'A Single Assistive Profile Applied by a Passive Hip Flexion Device Can Reduce the Energy Cost of Walking in Older Adults', *Applied Sciences*, 11(6), 2851-2857

Birmingham Community Healthcare NHS Foundation Trust