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CASE STUDY

PART2- Pt with Brown-Sequard Syndrome

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Following on from part 1, we continue the story of Mr. A…..

Quick summary of part one: 62 yr old ♂ with Brown-Sequard syndrome due to cervical spondylosis at C6/7 diagnosed 1999. Generally weak in L lower limb, especially quadriceps- leading to instability in stance; increased tone in plantarflexors disrupting foot clearance during swing. Mr. A wears a knee brace to stop his knee collapsing when walking. He was set up with quads stimulation during stance phase with the goal of being able to discard his knee brace. Common peroneal nerve stimulation (CPN) didn't initially improve walking significantly. To read Part 1 click here.

3 month review

Subjective comments:

- Mr. A had been using the quads stimulation regularly whilst walking, but still relying on the knee brace sometimes.
- He was issued a "foot-up" splint at initial set-up to help with foot clearance, but has been unable to wear this as it was causing pressure areas with the pull of the splint lifting his shoe which then rubbed his toes.

Treatment:

- At this apt Mr. A was set up with a two-channel stimulator (O2CHS) with one channel stimulating the CPN to improve foot clearance during swing and with the second channel over his quads to improve knee stability during stance.
- Mr. A found this new set-up quite "odd" as it was a very different walking pattern to the one he has got used to. Outcome measures assessing effort and speed didn't show any improvement. This is understandable as he would need some time to get used to this new pattern of walking.

Gait analysis:

*You can watch Mr. A's videos **by clicking on the links**:*

Initial apt- knee brace only (frontal plane)

Initial apt- knee brace only (sagittal plane)

3 month review- ODFS®O2CHS- CPN + quads, with knee brace (frontal plane)

3 month review- ODFS®O2CHS- CPN + quads, with knee brace (sagittal plane)

1. **Increased left knee extension during right swing**

	Sagittal plane	Frontal plant
Initial apt: Knee brace only		
3-month follow-up: O2 CHS- CPN and quadriceps		

2. **Reduction in exaggerated right knee flexion during stance (used for extra propulsion to clear left lower limb)**

	Sagittal plane	Frontal plant
Initial apt: Knee brace only		
3-month follow-up: O2 CHS - CPN and quadriceps		

3. **Improved left foot clearance, reduction in left circumduction, but increase in hip-hitching,**

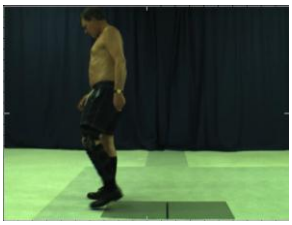
Sagittal plane Frontal plant

Initial apt:

Knee brace only

3-month follow-up:

O2 CHS - CPN and quadriceps



Discussion:

1. *Improved left knee extension in stance*- this shows the improvement in quads strength following stimulation. Main goal at this appointment was to completely discard using his knee brace (which he is very keen to do as it keeps cutting through his trousers!).
2. *Reduced right knee flexion in stance*- this shows that Mr. A does not need to rely on his right leg to vault off in order to improve clearance on the left side- suggesting that the CPN stimulation is being effective at improving foot clearance.
3. I*mproved foot clearance, reduced circumduction, but increased hip-hitching*- CPN stimulation is helping improve foot clearance, but he is still using some compensation mechanisms as he is still getting used to the set-up or not yet getting enough effect from the CPN stimulation.

Mr. A felt that using quads stimulation on its own for the first 3 months had been helpful. Colleagues had commented that he looked more upright in his posture, as did his wife. Having used a knee brace for a long time he found that giving it up was a big psychological hurdle. His goal was still to discard his knee brace, and he was hopeful that having had the O2CHS set-up that this would be possible. Mr. A. has a very active job, including walking around building sites, therefore he will have ample opportunity to test his O2CHS set-up.

6-month appointment

To see how Mr. A has continued to improve **watch his videos below**:

No stimulation (frontal plane)

No stimulation (sagittal plane)

ODFS®O2CHS- CPN during swing, quads during stance (frontal plane)

ODFS®O2CHS- CPN during swing, quads during stance (sagittal plane)