Neuroprosthetic and Neurotherapeutic Effects of Implanted Electrical Stimulation for Ambulation after Incomplete SCI

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Abstract
Motor system neuroprostheses assist ambulation in individuals with partial paralysis. The participant in this case study received a unilateral, 8-channel implanted FES system. When FES was used to enhance volitional effort after training with the system, there were statistically significant improvements (p < 0.003) in four key parameters: 1) 6 minute walk distance, 2) 6 minute walk speed, 3) double support time, and 4) knee extension moment. Improvements were also evident in ASIA motor scores. Moreover, statistically significant volitional gains were also found for the key outcome parameters, demonstrating the therapeutic effects of the system. These results demonstrate the potential for using this FES system as a neuroprosthesis for community ambulation with accompanying therapeutic gains.

References

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