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X-Glove: Case Study of Soft Robotic Hand Exoskeleton

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Abstract : Restoration of hand function and dexterity remain challenges in rehabilitation after stroke. We have developed soft exoskeleton hand robot in which using tendon-driven mechanism. Finger flexion and extension can be triggered by a foot switch and force can be adjusted manually depending on patient's grip strength. The objective of this study is to investigate feasibility and safety of this device. The study was done in 2 stroke patients with the strength of the finger flexors/extensors grade 1/0 and 3/1 on Medical Research Council scale, respectively. Grasp and release training was performed for 30 minutes. No complication was observed. Results demonstrated that the device is safe, and therapy can be tailored to individual patient's need. However, further study is required to determine recovery and rehabilitation outcomes after training in patients after nervous system injury.

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