Exoskeleton

see also Lokomat

The Hybrid Assistive Limb (HAL) was developed as an exoskeleton robot that supports gait training. The purpose of a study of Setoguchi et al. was to assess the usefulness of training using the HAL after total hip arthroplasty (THA). They targeted 16 consecutive patients who underwent THA via the posterior approach. They randomized patients to the HAL group (8 hips), in which the HAL was used as part of physical therapy, or the control group (8 hips), in which only typical physical therapy was performed. Gait analysis was performed before and after surgery, and comparisons were made between the two groups. They evaluated the single support time (%), double support time (%), cadence (steps/min), velocity (cm/s), stride length (cm), and anteroposterior and lateral variability, and assessed the hip and knee joint range of motion in the sagittal plane. The results showed improvements in the hip extension angle and other gait parameters in the HAL group. Among gait-related problems after THA, a decreased peak hip extension angle is reported to be a significant factor that affects gait disability. This study revealed that HAL usage after THA seems to be a useful method to obtain sufficient extension angle [1)].

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