

# PROGRESSIVE REHABILITATION AFTER TOTAL HIP ARTHROPLASTY: A PILOT AND FEASIBILITY STUDY

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## ABSTRACT

**Background:** The incidence of total hip arthroplasty (THA) has increased, due in part to younger individuals undergoing the procedure. Surgical techniques and biomaterials have improved, but rehabilitation has not kept pace with the needs of a changing demographic.

**Hypothesis/Purpose:** The purpose of this study was to evaluate the feasibility and preliminary effectiveness of a progressive strengthening and functional retraining intervention after THA.

**Study Design:** Intervention study

**Methods:** Twenty patients participated in the control group (n = 10) or experimental group (n = 10). The experimental intervention had few supervised sessions in the early phase after THA (weeks 0-12), followed by supervised, progressive, and high-level activity retraining in the later phase (weeks 12-16). Training in the experimental group was tailored to individual patient goals, which included a variety of vocational and recreational activities. The control group participated in usual rehabilitation care as prescribed by their surgeon. Therefore, the duration and content of rehabilitation of the control group therapy was not constrained. Testing included three-dimensional motion analysis of gait and a clinical evaluation prior to surgery and 16 weeks post-surgery. Change scores were calculated for pain, the Timed Up and Go (TUG), the Stair Climb Test (SCT), the Six-minute Walk Test (6MWT), the Thirty Second Chair Rise Test (30-CRT), strength, the Hip Outcome Scale (HOS), the Hip Dysfunction and Osteoarthritis Outcome Score for Joint Replacement (HOOS Jr), ground reaction force during stance, hip abduction moment, sit to stand ground reaction force, and symmetry between limbs during stance and sit to stand and compared between groups. Patient satisfaction and number of rehabilitation visits were also compared. Safety and feasibility were assessed using descriptive analysis of the number adverse events.

**Results:** One patient dropped from the control group prior to rehabilitation. The intervention group had a significantly greater improvement for the 6MWT than the control group ( $p = 0.011$ ), functional questionnaires ( $p = 0.034$ ), hip abduction strength on the non-surgical side ( $p = 0.01$ ) and greater satisfaction (96 vs 84 out of 100;  $p = 0.03$ ) at the conclusion of the intervention. The intervention group demonstrated a significantly greater improvement in force symmetry during sit-to-stand ( $p = 0.041$ ) as compared to the control group. There were no other significant differences in change scores for functional measures or discrete biomechanical metrics.

**Conclusion:** This physical therapy protocol, which focused on reducing supervised visits early after THA and retraining higher level activities later in the course of recovery, had a positive effect on biomechanics and functional outcomes without compromising safety. The effect of the experimental intervention was most appreciable for the 6MWT, non-surgical hip strength, satisfaction, and movement symmetry.

**Level of Evidence:** 2B

**Key Words:** Total hip arthroplasty, biomechanics, functional Performance, physical Therapy, Movement System

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**Conflict of interest:** The authors have no conflicts of interest to report.

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