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## Gait training while carrying loads in the early post-operative period improves muscle strength after total hip arthroplasty A randomized controlled trial

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**key words** Total hip arthroplasty • Gait training • muscle strength

**[Purpose]** Gait training while carrying loads in the ipsilateral hand may be an effective weight-bearing exercise for strengthening muscle of lower extremity after THA. However, there are no clinical trials that evaluated outcomes of gait training while carrying handheld loads after THA. The purpose of this study is to investigate the effects of gait training while carrying loads in the early post-operative period on the mid-term physical functions after THA.

**[Methods]** Twenty-six patients who underwent THA were randomized to an exercise group (n = 13) or a control group (n = 13). In exercise group, in addition to standard rehabilitation program, gait training while carrying loads in one hand to the side of THA was performed for 2 weeks. After intervention, the participants in the both group did not receive any intervention. Outcome measure were hip pain, hip range of motion, muscle strength of lower extremity and Timed up and go test. These parameters were assessed before surgery, 4 week and 6 month postoperatively.

**[Results]** The two-way ANOVA analysis showed a significant group by time interaction effect for the hip abductor and knee extensor strength (P<0.01). The hip abductor strength at 4 weeks after THA showed significantly better results in the exercise group than in the control group. The hip abductor and knee extensor strengths in the exercise group were significantly greater than in the control group at 6 month postoperatively.

**[Discussion]** The hip abductor strength at 4 weeks after THA was significantly greater in the exercise group than in the control group because carrying loads in the ipsilateral hand may contribute to promote weight bearing to the operative side for strengthening hip abductor muscle. Moreover, increasing physical activity by strengthening hip abductor strength in early stage after THA result in improvement of muscle strength of lower extremity at 6 month postoperatively.