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Robot-Assisted Gait Training for Periprosthetic Femur Fracture: A Case Report

Doyoung Lee, MD[1], Ikhyun Lim,MD[1], Hongsuk Baik, MD[1], Kyunghoon Min, MD, Ph.D.[1,2]

[1] *Department of Rehabilitation Medicine, CHA Bundang Medical Center, CHA University School of Medicine, Republic of Korea*

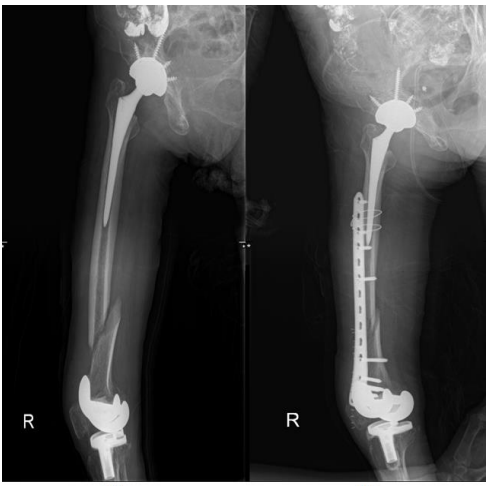
[2] *Rehabilitation and Regeneration Research Center, CHA University, Republic of Korea*

Introduction

- The incidence of periprosthetic femur fractures is steadily increasing, especially in the elderly population with comorbidities including osteoporosis, osteolysis, chronic steroid therapy, and rheumatoid arthritis.
- In this population, femur fractures are a major health concern as they can cause muscle atrophy and reduced motor function, making it difficult for patients to return to their daily lives.
- Robot-assisted gait training (RAGT) is a beneficial tool for effectively implementing repetitive, high-intensity gait training, which is essential for returning to daily life.
- This study aimed to investigate the effects of RAGT on patients with periprosthetic femur fractures, using Morning Walk therapy (Fig. 1).

Figure 1. Morning Walk – assisted gait training

Figure 2. A 79-year-old woman with periprosthetic fracture in the distal femur shaft. (A) Preoperative radiographs, (B) postoperative radiographs.



(A) (B)

Case reports

- A 79-year-old woman who underwent right hip and bilateral knee arthroplasty at different times in the past had open reduction and internal fixation due to periprosthetic femur fracture in May 23 (Fig 2).
- At 4 months after the surgery, in evaluation, motor grade of right lower extremity were lowered to F- grade. Functional Ambulation Categories (FAC) scale 1 point, Berg Balance Scale (BBS) 10 points and Trunk Instability Scale (TIS) 9 points were evaluated.
- During her hospitalization she received RAGT for 30min, 4times a week for 5 weeks with conventional physiotherapy (Fig 3).
- In follow up evaluation, motor grade of right lower extremity were improved from F- to F grade. FAC scored 1 point. BBS improved from 10 to 19 points and TIS improved from 9 to 10 points.

Assessment factor	T0 (Before the treatment of RAGT)	T1 (After the treatment of RAGT)
FAC	1	1
BBS	10	19
TIS	9	10
L/Ex MMT, (right side)	F-	F- ~ F

Figure 3. Rehabilitation exercise. (A) Morning Walk – assisted gait training, (B) Conventional physiotherapy.

(A) (B)

Conclusion

- Robot-assisted gait training combined with conventional physiotherapy appears to be useful for achieving functional outcomes and returning patients to their daily lives.
- Our findings suggest that Morning Walk therapy is a promising intervention for gait rehabilitation.