



## Effects on Balance and Functional Ability of the End-Effector Robot-assisted Gait Training on Spastic Cerebral Palsy: A Case Report



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### Introduction

- **Gait is commonly affected by cerebral palsy**, and a recent update of the Cochrane review concluded that treadmill training interventions in children with CP may accelerate motor skill attainment.
- **Previous studies** on CP patients reported improvements in gait function, such as the 6-minute walk test and 10-meter walk test, but this is **still controversial**.
- In this case, we tried to find out **whether RAGT with end-effector type robot (Morning Walk<sup>®</sup>)** showed **improvement in balance and spasticity** as well as **walking ability in CP patient**.



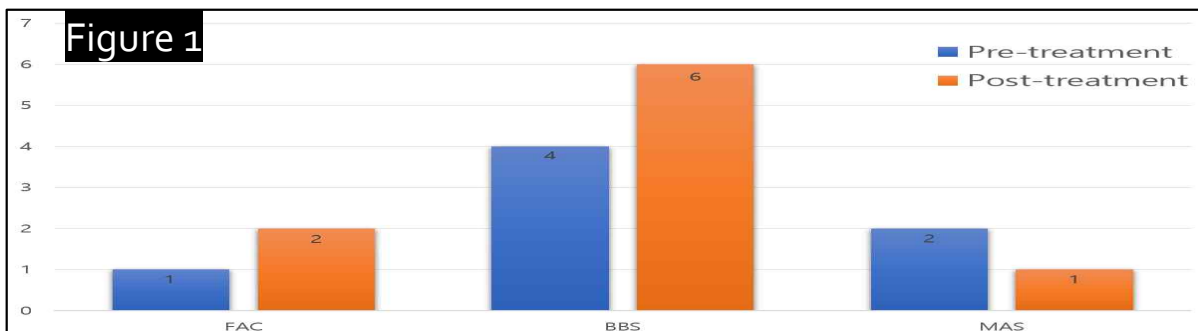
### Case Presentation (7/F)

- **A 7-year-old female with CP (Table 1)**

Table 1.	Patient's history
Gestational age (GA)	31+3 weeks
Birth weight	1.18kg
In vitro fertilization (IVF)	Twin (Triplet, 1-intrauterine death)
Brain MRI (At birth)	Cortical dysplasia in the bilateral parietal lobe

- **Walking ability, balance, and spasticity were measured at admission and discharge.**
  - Functional Ambulation Category (FAC)
  - Berg Balance Scale (BBS)
  - Modified Ashworth Scale (MAS)
- **The patient was received training for 30 min once/day, 5 days/week, for 2 weeks.**
  - At admission setting : Speed (0.26 km/hr), Cadence (25 steps/min)
  - At discharge setting : Speed (0.72km/hr), Cadence (45 steps/min)

- **Values of Pre-treatment and Post-treatment (Figure 1)**



- **Values of Pre-treatment and Post-treatment (Table 2)**

Table 2.	Pre-treatment	Post-treatment
PROM	0 degrees*	10 degrees*

\* Passive Range of Motion (PROM) degrees were measured in ankle dorsiflexion during knee extension.

### Conclusion

- This study aims to report the **effects of robot-assisted gait training (RAGT) with end-effector type robot, Morning Walk<sup>®</sup>**, in spastic cerebral palsy.
- In previous studies, evidence from the present systematic review with meta-analysis demonstrated the RAGT can clinically improve gait parameters and functionality in individuals with CP over the long-term.
- There are few reports which show the objective changes through walking ability, **balance and spasticity using FAC, BBS, and MAS**.
- This case is **meaningful in that RAGT with end-effector type robot plays a significant role in walking ability, balance and spasticity in spastic cerebral palsy patient**.