



**Service Priorities and Programmes**  
**Electronic Presentations**

**Convention ID:** 286

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**The effectiveness of combining botulinum toxin and serial casting in the treatment of spastic equinus in children with cerebral palsy**

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**Keywords:**

serial casting  
botulinum toxin  
cerebral palsy  
equinus  
gait  
range of motion

**Introduction**

Equinus is a common gait disorder in children with cerebral palsy (CP). This deformity is caused by spasticity and hypoextensibility in the triceps surae, resulting in unstable and inefficient gait. Serial casting uses a series of casts to gradually increase the stretch to muscles. When used in combination with botulinum toxin (BoNT-A), it has been shown to improve muscle length and passive joint motion.

**Objectives**

To study the effect of combining BoNT-A and serial casting in the treatment of spastic equines in children with CP.

**Methodology**

This is a single-group pre- and post-comparison study. Children with CP and spastic equinus, received BoNT-A at the Paediatric Department of QEH, were recruited and received serial casting at the Physiotherapy Department of Kowloon Hospital. Assessment conducted included: • Range of motion (ROM), • Spasticity, • Lower limb alignment, • Physician Rating Scale (PRS) on gait pattern, and • Gillette Functional Gait Assessment Questionnaire (FAQ). Tailor-made and goal-specific casting program was then performed.

**Result**

7 children of age 1.5 to 7 years (3.6±2.0) were recruited. Their diagnoses were diplegia (n=4), triplegia (n=1) and quadriplegia (n=1). Their Gross Motor Function Classification System were level II (n=4) and III (n=3). Casting period ranged from 12 to 33 days (20 ± 8). There was significant increase in passive dorsiflexion of the ankle 120° ± 60° (p<0.01). All children had midfoot breakdown prior to casting. They all had improved medial foot arch alignment in non-weight bearing position after casting.

Upon 3-month evaluation (n=4), 2 progressed in PRS and 3 improved in FAQ. No complications of casting occurred. Parents commented that their children improved walking stability, endurance, stood more upright and easier to conduct stretching program. They opted to repeat casting if indicated. According to the preliminary results, combining BoNT-A and serial casting was effective in lengthening the triceps surae, improving ankle dorsiflexion ROM and midfoot alignment in children with spastic equinus. Repeating the procedures in these growing children at time of need will help to reduce the chance of more invasive procedures like surgical lengthening of the triceps surae and correction of midfoot breakdown.