

Introduction

It is common for chronic stroke patients with hemiplegia to experience spasticity in their ankle and foot muscles, which can manifest in various patterns and result in deformities like varus, equinus, and equinovarus. These deformities often cause gait disorders. While botulinum toxin injections are frequently used to manage muscle spasticity in the ankle and foot, their effects are temporary and require repeat administration.

This study reports that **surgical intervention** can serve as **a viable option** for patients who experience **short-lived relief from botulinum toxin injections**.

Case

- **A 27-year-old male** visited the Rehabilitation Medicine department for **gait disturbance** and **spasticity** of his left foot that has recently worsened (**Feb 2022**).

- **Past medical history**

- Right middle cerebral artery infarction two years ago.

- **Symptom**

- Left spastic hemiparesis
- Inversion of left foot
- Crawling toes
- Left foot pain

- **Physical examination**

- Full passive range of motion in his left ankle
- Tibialis posterior (TP): MAS Gr.1
- Flexor digitorum longus (FDL): MAS Gr.1
- and flexor hallucis longus (FHL): MAS Gr.1

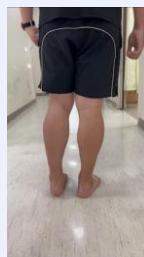


Figure 1. Six weeks after the injection, toes had returned to their pre-injection state

- **Nerve conduction studies and electromyography**

- No definite abnormalities in the peripheral nervous system

- **Injection (Jun 2022)**

- Botulinum toxin injections
 - TP (100 units), FDL (120 units), FHL (80 units)
- Alcohol block
 - Medial (4 mL), lateral (3 mL) of left gastrocnemius

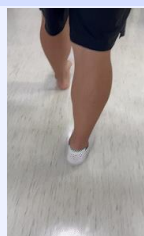


Figure 2. Ten weeks after the injection, both ankles and toes were back to their pre-injection state

- **Post-injection state**

- Six weeks after the injection (Figure 1)
 - Toes had returned to their pre-injection state
 - Ankle had remained improved.
- Ten weeks after the injection (Figure 2)
 - Back to their pre-injection state

- **Surgical intervention (Oct 2022)**

- Proximal gastrocnemius release
- TP to lateral cuneiform transfer
- FDL, FHL lengthening

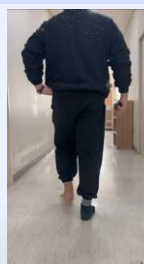


Figure 3. Four months after the surgery, varus deformity was entirely improved

Conclusion

This case report presented treatment options for ankle and foot deformities. Botulinum toxin injections are a viable option for the management of ankle and foot deformities caused by muscle spasticity in chronic stroke patients, but their temporary effects necessitate repeated injections, which can be inconvenient and costly. As shown in the case report, surgical intervention, such as gastrocnemius release and tendon transfers, may be considered for patients who experience short-lived relief from botulinum toxin injections.