PS-16

Intrathecal Baclofen Therapy Improved Gait Pattern in a Stroke Patient with Spastic Dystonia

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Introduction

Spasticity is a major clinical subtype of muscle hypertonia that is often presented as a common clinical sign in patients suffering from spinal or cerebral dysfunction arising from stroke. With the term "spasticity" widely used in the clinical environment to include spasms, involuntary movements and unwanted muscle activity, many recent studies have attempted to accurately clarify its definition. Spasticity is commonly described as a stretch reflex disorder, relating to an increase in the velocity-dependent stretch responses of a muscle. Some involuntary overactive movements and unwanted muscle overactivities are also classified under spastic movement disorder. This clinical manifestation has been defined as spastic dystonia, a field of study that has yet to be further explored.

Intrathecal baclofen (ITB) therapy is accepted for spasticity of cerebral or spinal origin that cannot be managed with oral medications. However, little evidence on ITB treatment for spastic dystonia is reported. Prior to ITB pump implantation, ITB bolus injections are given to rule out adverse reactions and to ensure the therapeutic effect of the drug on the hypertonic problems. Herein, we report a spastic dystonia case that showed remarkable improvement in both Modified Ashworth scale (MAS) and gait pattern after ITB injection trial.

Case report

We report the case of 67-years-old male diagnosed with left-side hemiplegia with spastic dystonia due to intracranial hemorrhage (ICH) in right basal ganglia and right thalamus, receiving ITB injection trial. The patient was first diagnosed with right basal ganglia ICH in 2004 when he went to the hospital for facial palsy and gait disturbance. At that time, only mild gait disturbance sequelae were seen, and there was no spastic dystonia. In 2012, he showed left hemiplegia and hypoesthesia, and was diagnosed with right thalamic ICH. Since then, he has undergone rehabilitation treatment and showed dystonic movement in his left upper and lower limbs. He had been treated with botulinum toxin injection and oral medication for spastic dystonia until 2021, but his symptoms did not improve. For that reason, in October 2022, he was admitted to the Department of Rehabilitation Medicine for ITB injection trial and further evaluation.

In terms of spasticity, his left upper and lower extremities corresponded to MAS of 1 to 2. Specifically, his knee flexor and extensor muscles corresponded to MAS of 2 (Table 1). In gait analysis, he showed left knee hyper-extension in stance phase and decreased left knee flexion in swing phase (Fig. 1-A). This clinical sign could be an irrepressible spontaneous tonic contraction prior to muscle stretch, indicating the manifestation of spastic dystonia.

Result

Trial on the effect of ITB bolus injection is usually given with incremental doses from 12.5mcg to 75mcg during 4 consecutive days. The judgement of the effect of ITB on spastic dystonia is made based on clinical assessment including both MAS and gait analysis. Decreased serial MAS expressed that spastic dystonia decreased with an increasing dose of baclofen (Table 1).

In addition, serial kinematic changes in gait analysis showed left knee hyper-extension in stance phase and decreased left knee flexion in swing phase were improved (Fig. 1-B).

Table 1. Changes in Modified Ashworth Scale after Intrathecal Baclofen Injection Trial

Left muscle	Day 0	Day 1	Day 2	Day 3	Day 4
	0mcg	12.5mcg	25mcg	50mcg	75mcg
Shoulder flexor	G1+	G1+	G1+	G1	G1
Shoulder extensor	G0	G0	G0	G0	G0
Elbow flexor	G2	G2	G2	G1+	G1
Elbow extensor	G1+	G1+	G1+	G1+	G1
Hip flexor	G1+	G1+	G1+	G1	G1
Hip extensor	G1+	G1+	G1+	G1	G1
Knee flexor	G2	G2	G1+	G1	G1
Knee extensor	G2	G2	G1+	G1	G1
Ankle dorsi flexor	G0	G0	G0	G0	G0
Ankle plantar flexor	G1	G1	G1	G1	G0

Conclusion

This case report demonstrates that ITB therapy significantly improved gait pattern in spastic dystonia. Furthermore, we suggest that ITB pump implantation can be an appropriate treatment option for spastic dystonia in patients with stroke.

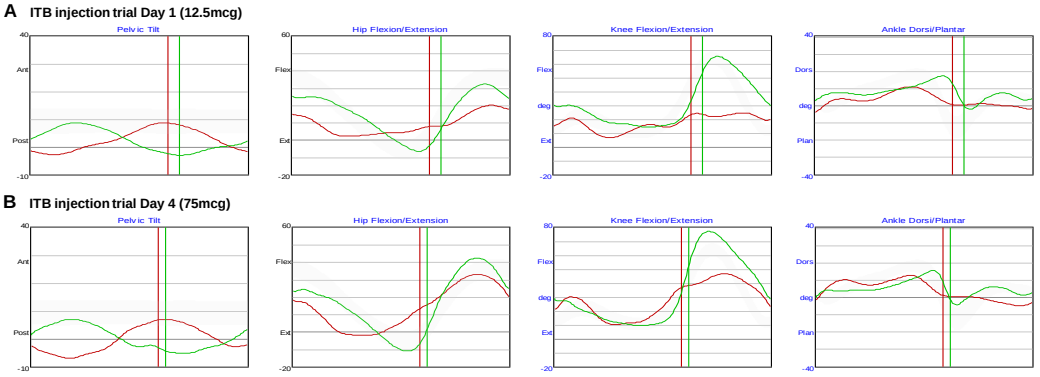

Fig. 1. Kinematic Changes in Gait Analysis after ITB injection trial. When compared with 12.5mcg injected state (Day 1) (A), left knee hyper-extension in stance phase and decreased flexion in swing phase were improved after 75mcg injected state (Day 4) (B). ITB: Intrathecal Baclofen