

### Introduction

Spasticity is one of the primary motor impairments after stroke and introduces significant challenges for treatment and patient care. It affects about one in four patients who suffer a stroke [1]. A mechanism for stroke-related spasticity is the hyperexcitability of the reticulospinal tract, which results in maladaptive plasticity. Facilitation and modulation of neural plasticity through rehabilitative strategies are important to promote motor recovery and improve quality of life [2]. In addition to repetitive intensive goal-oriented therapies and pharmacological agents, botulinum toxin can help create a transient plastic state to promote motor learning and functional recovery.

The novel coronavirus pandemic (COVID-19) provided another barrier for the treatment of patients with spasticity. In March 2020, American Academy of Physical Medicine and Rehabilitation (AAPM&R) recommended all elective procedures be postponed, minimized or canceled until further assessment by the Center for Disease Control and Prevention [3]. There were no clear guidelines on safety of administration or the pharmacological effects of botulinum toxin type A injections in the setting of COVID-19.

### Case Description

**Setting:** Academic Acute Inpatient Rehabilitation Hospital

**Patient:** 78-year-old male with stroke-related spasticity in the setting of COVID-19

**Case Presentation:** Patient is a 78-year-old male with a past medical history of HLD and Gilbert disease that was admitted to an inpatient rehabilitation facility (IRF) following a stroke. He presented with left hemiparesis and dysarthria and was found to have acute right basal ganglia infarct. About 1 week into his IRF admission, he started to develop symptoms of an upper respiratory infection. He was transferred to an acute care hospital for respiratory failure and was treated for COVID-19. He returned 10 days later for readmission. On his second IRF admission, he was noted to be functionally limited by left upper

### Case Description (continued)

and lower extremity spasticity. He was trialed with pharmacological treatments that were not effective and had undesirable side effects; he was referred for botulinum toxin injections while on the COVID-19 isolation unit. The patient was stable and he had no contraindications for this intervention. Full contact and droplet isolation precautions were employed and injections were administered with no complications.

	Pre-morbid	Initial IRF Admission	Second IRF Admission	Discharge
<b>Eating</b>	Independent	Minimal Assistance	Minimal Assistance	Independent
<b>Grooming &amp; Hygiene</b>	Independent	Moderate Assistance	Minimal Assistance	Independent
<b>Upper Extremity Dressing</b>	Independent	Moderate Assistance	Moderate Assistance	Minimal Assistance
<b>Lower Extremity Dressing</b>	Independent	Maximum Assistance	Maximum Assistance	Moderate Assistance
<b>Bed Mobility</b>	Independent	Moderate Assistance	Minimal Assistance	Supervision
<b>Supine-Sit</b>	Independent	Maximum Assistance	Maximum Assistance	Supervision
<b>Sit-Stand</b>	Independent	Maximum Assistance	Total Assistance	Supervision
<b>Transfer</b>	Independent	Maximum Assistance	Maximum Assistance	Moderate Assistance
<b>Toilet Transfer</b>	Independent	Maximum Assistance	Not Evaluated	Minimal Assistance
<b>Ambulation</b>	Independent	Total Assistance	Not Evaluated	Minimal Assistance

**Table 1:** Functional independence measure from pre-morbid condition to discharge. Pre-morbid was day 0, Initial IRF admission was day 7, Second IRF admission was day 17, Discharge was day 57.

### Assessment / Results

This patient arrived at moderate to maximum assistance with ADLs and total assistance with ambulation during his initial IRF stay. After an acute care send out due to COVID-19, he returned for a second IRF stay. His progress was limited by left-sided spasticity. Left knee flexion tone was Modified-Ashworth-Scale (MAS) 2, hip adduction MAS 3, shoulder internal rotation MAS 3, shoulder abduction MAS 1, finger flexion MAS 2. Gait was limited by left hip adduction. With appropriate precautions, he received botulinum toxin injections to the left pectoralis major, biceps brachii, flexor digitorum superficialis, flexor digitorum profundus, and adductor longus muscles, with a total of 200 units of onabotulinumtoxinA without complications. He demonstrated functional improvements in ambulation with minimal assistance, upper body dressing < 25% assistance and other improvements that can be seen in Table 1. He was successfully discharged home with family.

### Discussion / Conclusions

**Discussion:** Identifying and treating stroke-related spasticity is important in decreasing impairment. In the setting of COVID-19 isolation, the administration of botulinum toxin has not been extensively studied. As of now, protocols have been put in place in order to stratify the necessity of this intervention. In most situations, the administration of botulinum toxin type A injections have been performed under strict PPE and safety precautions [2].

**Conclusion:** Untreated spasticity contributes to impaired function. In the setting of the COVID-19 pandemic, it is important to adopt certain precautions in order to safely provide this intervention. This case highlights a particular need in a patient with stroke on the COVID-19 isolation unit and the safe administration of botulinum toxin type A.

### References

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