

**Case series: Integrated rehabilitation - Surgical intervention in involuntary spasticity among post-traumatic brain injury patients for a better functional outcome.**

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**INTRODUCTION:**

Traumatic brain injury (TBI) impact lives of many individuals with severe spasticity causing disability in musculoskeletal function. The aim of this report is to highlight four cases with improved functional rehabilitation of involuntary spasticity in post-traumatic brain injury patients with combination of surgery and rehabilitation programme.

**CASE SERIES REPORT:**

**1<sup>st</sup> case:**

A 59-year-old woman with right basal ganglia bleed complicated with left upper limb flexor synergy pattern spasticity initially underwent stretching and botox injections by the rehabilitation team to the left biceps and flexor digitorum superficialis (FDS) to improve her gait pattern which was affected by the upper limb spasticity. Her gait improved post-intervention but the upper limb spasticity recurred 3-months later. She subsequently agreed for neurectomy of the nerve to biceps with tenotomy to the long flexors of the fingers and thumb. Immediately, post-surgery her gait improved and she was able to better take care of her hand hygiene.

**2<sup>nd</sup> case**

A 32-year-old man with severe traumatic brain injury (TBI) with right brachial plexus injury in 2022 and severe wasting of the deltoid and biceps muscle. He was started on an early rehabilitation programme for his right upper limb. He underwent multiple nerve transfers – fascicle of ulnar nerve to biceps motor branch, fascicle of median nerve to brachialis motor branch, nerve to long head of triceps to anterior axillary nerve. Currently, at 6-months post-operatively there are signs of muscle reinnervation.

**3<sup>rd</sup> case**

A 38-year-old man with severe TBI complicated with spasticity of the right upper limb. He also has multiple contractures over his right upper limb, hip, knee and ankle.

Multiple rehabilitation treatment commenced including stretching with continue right upper limb antispastic

splint. He undergone series of botox injection since 2 years ago over subscapularis, pectoralis major and brachioradialis Later tenotomy done over right FDS of index, middle, ring and little fingers, FDP and FPL fractional lengthening. He had significant improvement in term of range of motion over right elbow and less stiffness.

**4<sup>th</sup> case**

A 36 year-old-man , had severe TBI in 2006, with left hemiparesis and left spasticity of upper and lower limb. He did botox injection few times but have no improvement in spasticity. He was also prescribed with antispastic customised hand splint with assistive symmetrical finger extension and resistive finger flexion - using spring active stretching. He had home-based FES myolito , monitored by physiotherapist during every session.He was then did tenotomy of left bicep tendon, brachioradialis, ECRL,FPL all FDP and FDS tendon. He did lengthening of brachialis muscle. Patient now able to extend and flex wrist and flex the elbow. He have marked improvement over left upper limb spasticity.

**CONCLUSION:**

Dynamic approach with combination of surgical and rehabilitation programme should become a key for a better functional outcome in severe spasticity patients, thus breaking the barrier for practical re-entry into the community.

**REFERENCES:**

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