

Introduction

- Brachial plexopathy can occur due to various causes such as tumors, radiation, thoracic outlet syndrome, malposition, and trauma.
- Previous studies have shown that malpositioning during an operation, with the shoulder externally rotated and abducted above 90 degrees, can cause brachial plexopathy.
- Other study showed during military service, strenuous push-up exercise was the major causative event of brachial plexopathy and was associated with hereditary neuropathy with liability to pressure palsies (HNPP).
- Here, we report on **non-HNPP patient with compressive brachial plexopathy** at trunk level after prolonged front leaning rest posture and push up in military service.

Case report

- A 22-year-old female presented to the Physical Medicine and Rehabilitation clinic with symptoms of numbness and weakness in her left arm.
- She had experienced these symptoms after **performing many push-ups and a prolonged front leaning rest posture** during her military service on October 13th, 2022.

- The prolonged front leaning rest posture involves placing both hands shoulder-width apart and maintaining a straight horizontal alignment with the body and the ground.
- When she visited our hospital one month after the onset of symptoms, she reported that the motor weakness had not significantly improved.

- Physical examination revealed a negative result on the Spurling's test, touch hypesthesia in the left lateral deltoid area, and decreased left side muscle strength in shoulder flexion, the empty can posture, and shoulder external rotation (Table 1).

- Electrophysiologic study showed **left upper trunk brachial plexopathy**.

- We conducted brachial plexus magnetic resonance image (MRI). T2 weighted image showed **high signal intensity of the nerve fascicles in the superior, middle, and inferior trunks at the left brachial plexus trunk level**, as well as denervation edema in the left supraspinatus and infraspinatus muscles (Figure 1).

- To rule out HNPP, we conducted Peripheral myelin protein 22 (PMP22) gene duplication/deletion test and it was not detected.

- During a follow-up visit on December 26th, 2022, she reported improvement in left-side weakness, with a muscle strength of 5- in left shoulder flexion, 5- in left shoulder abduction, and 4 in left external rotation.

- The patient was educated to avoid positions that may cause compression of brachial plexus like push-up position or prolonged front leaning rest posture.

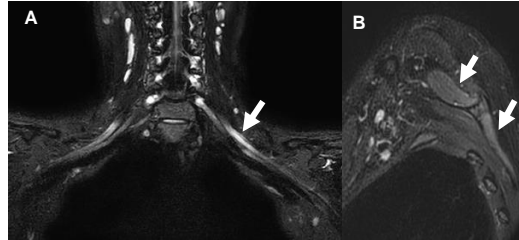


Figure 1. Brachial plexus MRI showed high signal intensity of upper, middle, lower trunk (A, arrow) with denervation edema in supraspinatus, infraspinatus muscle (B, arrow).

Table 1. The results of neurological examination and electrophysiologic study

	Category	Result
N/Ex	Motor strength (MRC grade)	Shoulder flexor 5/2
		Shoulder abductor 5/4
		Shoulder external rotation 5/2
		Empty can 5/4
		Elbow flexor 5/5
Sensory exam	Spurling's test	Wrist dorsiflexor 5/5
		Finger flexor 5/5
		Touch hypesthesia in Lt. lateral deltoid area
EP study	DTR	Negative
	Sensory NCS	Biceps jerk 2/2
		Triceps jerk 2/2
	Motor NCS (CMAP)	No electrophysiological abnormalities
Needle EMG	Spontaneous activity	Decreased amplitude in Lt. musculocutaneous nerve
	MUAP	Denervation potential in Lt. Supraspinatus, Lt. Infraspinatus, Lt. Flexor carpi radialis, Lt. Supinator, Lt. Pronator teres
		Decreased MUAP recruitment in Lt. Supraspinatus, Lt. Infraspinatus, Lt. Flexor carpi radialis, Lt. Triceps brachii, Lt. Supinator, Lt. Pronator teres, Lt. Abductor pollicis brevis

Abbreviations: N/Ex; Neurologic examination, EP; Electrophysiologic, MRC; Medical Research Council, DTR; Deep Tendon Reflex, NCS; Nerve Conduction Study, EMG; Electromyography, CMAP; Compound Muscle Action Potential, MUAP; Motor Unit Action Potential

Conclusion

- This case demonstrates a case of compressive brachial plexopathy following prolonged front leaning rest posture in a non-HNPP patient.
- We hypothesized that during prolonged front leaning rest posture, the clavicle and rib cage move in an antero-superior direction, resulting in compression of the brachial plexus, particularly at the retro-clavicular area and upper trunk level due to the anatomical position during front leaning rest posture.
- Although a mechanism for explaining compressive brachial plexopathy after that posture remains unclear, it is recommended to avoid prolonged front leaning rest posture during military training to prevent compressive brachial plexopathy.