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The importance of proper management and orthosis in stroke patient with brachial plexopathy : A case

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Introduction

Brachial plexus injury(BPI) is rare but at the same time one of the most severe complication of shoulder dislocation and subluxation. In stroke patients, dislocation and subluxation of the shoulder joint is one of the common complication. Accordingly, BPI is one of the possible complications in patients with dislocation or subluxation after stroke. We report a case about brachial plexopathy in stroke patient.

Case

A 60-year-old male patient had a sudden onset of left weakness. So, he had an examination for brain magnetic resonance imaging(MRI) and computed tomographic angiography(CTA) and was diagnosed with Right MCA infraction. The thrombectomy at occlusion artery was performed. He had history of hypertension. Before stroke he could walk independently and showed independent an independent Activities of daily living(ADL).

After thrombectomy, he underwent comprehensive rehabilitation treatment with conventional physical, occupational therapy and repetitive transcranial magnetic stimulation(rTMS) due to his left side weakness. After rehabilitation treatment his left shoulder MMT was fair+, elbow was fair+, wrist was fair and thumb was possible in extension. MMT of left upper limb were improved, but some of subluxation was left in his shoulder joint. (Table 1). After that, he transferred to another hospital.

After 2 months, the patient visited to OPD for worsen weakness of left upper limb. The Left shoulder was Trace, elbow was poor, wrist, thumb and finger was zero(Table 1). Therefore, brain MRI was taken with suspicious about new onset of stroke, but there was no evidence of new onset or progression of stroke. So, we evaluated other cause of worsen weakness in left upper limb such as peripheral lesion, then we studied electrodiagnostic examination (Table 2).

As a result of the evaluation, the electrodiagnosis finding was brachial plexopathy involved the whole trunk. Brachial plexus MRI was also taken, and there was no mass lesion around brachial plexus. So we supposed the cause of brachial plexopathy attributed to shoulder subluxation.

Table1. Mannual muscle test

		1st	2nd	3rd
		RT/LT	RT/LT	RT/LT
MMT	shoulder flexor	Normal/Fair+	Normal/Trace	Normal/Trace
	elbow flexor	Normal/Fair+	Normal/Poor	Normal/Poor+
	elbow extensor	Normal/Fair+	Normal/Trace	Normal/Poor+
	wrist flexor	Normal/Fair	Normal/Zero	Normal/Trace
	wrist extensor	Normal/Fair	Normal/Zero	Normal/Trace
	finger flexor	Normal/Trace	Normal/Zero	Normal/Zero
	thumb extensor	Normal/Fair	Normal/Zero	Normal/Zero

Note: 1st,Initial admission, 2nd, Readmission, 3rd, 6weeks after readmission

Abbreviation.
MMT, Manual muscle test
RT/LT, right/left

For proper positioning of shoulder joint, we prescribed extended arm sling and conducted conventional physical and occupational therapy(fig1). After 6 weeks, the proximal MMT was improved but there were little improvement in distal limb. And we followed up EDX studies. The EDX finding showed that improved state of brachial plexopathy compared with previous study(Table 2).

Conclusion

Shoulder subluxation is a common complication in stroke patients. In this case, we reported worsen weakness of upper limb of patient with showing recovery after stroke. The proper position of shoulder joint in hemiplegic side may be neglected in patient whose upper limb MMT is higher than fair grade. But it is very important and basic treatment for prevention of secondary damage, such as BPI in affected side after stroke.

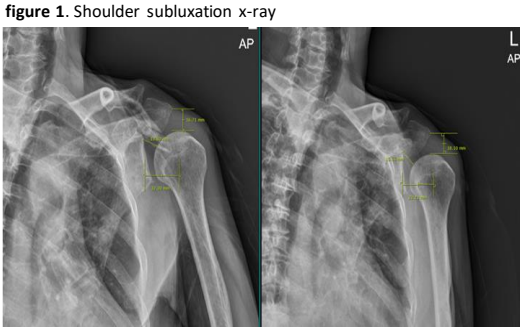
Table2. Electrodiagnostic studies

	1st.	2nd.	1st.	2nd	1st.	2nd.
Motor nerves	**Onset latency (ms)**		**O-P amplitude (mV)**		**CV (m/s)**	
Median (RT/LT)	3.8/3.8	3.8/3.5	7.1/5.3	8.2/6.8	54/52	59/55
Ulnar (RT/LT)	2.6/2.7	2.3/2.7	8.9/4.3	8.6/7.0	60/57	54/55
Axillary (RT/LT)	4.0/3.8	4.3/4.1	14.8/6.2	17.9/10.8		
Musculocutaneous (RT/LT)	3.9/4.1	5.3/4.1	16.3/10.4	14.6/13.7		
Radial (8cm)	1.6/2.2	1.6/1.6	9.3/5.0	10.7/5.3	63/65	65/64
Suprascapular	2.6/2.0	2.9/2.4	5.6/4.9	5.9/4.5		
Sensory nerves	**Onset latency (ms)**		**O-P amplitude (mV)**			
Median (RT/LT)	3.4/3.6	3.0/3.5	14.8/8.8	15.6/13.0		
Ulnar (RT/LT)	2.5/2.5	2.6/2.4	32.4/25.7	30.0/20.0		
Lat. Ant. B. C (RT/LT)	1.6/1.7	1.9/1.9	19.3/9.8	19.9/12.7		
Med. Ant. B. C (RT/LT)	1.4/1.7	1.6/1.5	20.2/11.0	14.5/8.2		
Radial (RT/LT)	1.3/1.5	1.2/1.3	51.7/30.0	62.2/47.3		

EMG	Denervation potential		Recruitment pattern	
Deltoid	-	-	Reduced	Reduced
Biceps brachii	1+	-	Reduced	Full
Triceps brachii	2+	1+	Reduced	Single
Flexor carpi radialis	2+	1+	No	No
Abductor pollicis brevis	2+	-	No	No
Extensor digitorum communis	1+	-	Reduced	Reduced
First dorsal interosseus	2+	1+	No	No
Infaspinatus	1+	1+	Reduced	Reduced
Supraspinatus	1+	-	Reduced	Reduced
Serratus anterior	2+	-	No	Reduced
Rhomboideus major	-	-	Reduced	Single

Abbreviation.
O-P, onset to peak
CV, conduction velocity, all conduction velocities were calcaulated at distal segments
RT/LT, right/left
EMG, electromyography

figure 1. Shoulder subluxation x-ray



(A) In orthosis (B) Pre orthosis