

Hourglass-like constriction of extraforaminal C5 root in the brachial plexus: A Case Report

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Introduction

- Hourglass-like constriction neuropathy is defined as fascicular constriction of peripheral nerves, unrelated to intrinsic or extrinsic compression.
- So far, hourglass-like constriction has mostly been reported in peripheral nerves and is usually diagnosed with magnetic resonance neurography or detected during exploratory surgery.
- However, hourglass-like constriction neuropathy of the brachial plexus is extremely rare.
- Here, we report on a patient with hourglass-like constriction of the extraforaminal C5 root who presented with clinical manifestations of neuralgic amyotrophy.

Case Description

- A 68-year-old male presented to the Neuromuscular Medicine clinic with a 16-month history of right upper extremity weakness and right paracervical, upper trapezius area, and upper arm extensor side pain.
- 16 months ago, the pain first occurred, so he received cervical epidural steroid injections twice at a local clinic.
- After the two injections, right upper extremity weakness occurred and he had difficulty elevating his shoulder.
- Weakness and pain didn't have significant improvement, so he visited the Neurology department 3 months after pain onset.
- Electromyography showed brachial plexopathy in the right upper trunk, and magnetic resonance imaging (MRI) of brachial plexus showed T2 high signal intensity in the right C5 nerve root to the upper trunk and denervation edema of infraspinatus muscle.
- He received intravenous steroid therapy.
- Afterwards, the pain and weakness in the right upper limb had mild improvement, but some remained and caused discomfort in daily living.
- Therefore, he visited the Neuromuscular Medicine clinic for further management. He complaint of pain in the same area as when it first occurred in numeral rating scale (NRS) 3.
- The results of neurologic examination and electrophysiologic study are shown in Table 1.
- MRI of cervical spine showed mild neural foramen stenosis at C4-5 level (Figure 1).
- MRI of brachial plexus showed constriction of right C5 extraforaminal nerve root, 1 cm from the insertion to the upper trunk, and infraspinatus denervation edema (Figure 2).

- He received intravenous steroid therapy once more.
- Immediately after steroid treatment, pain decreased from NRS 3 to 1, but there was no difference in muscle strength.
- Thereafter, he was planned to consider surgical neurolysis if there was no improvement at the outpatient clinic, but follow-up was not done.

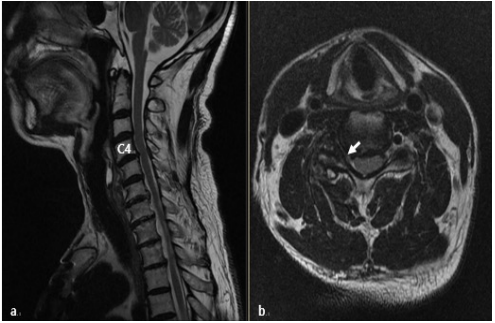


Figure 1. Cervical spine MRI

MRI of cervical spine showed diffuse disc bulging and right facet arthritis at C4-5 level, and mild compression of C5 nerve root (white arrow) (a) sagittal T2 weighted image (b) axial T2 weighted image).

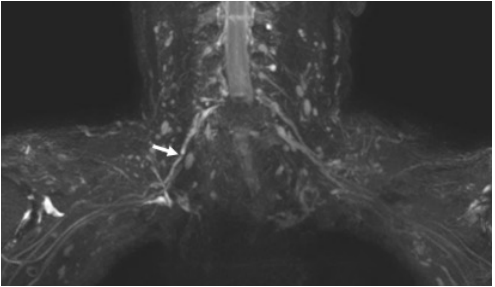


Figure 2. Brachial plexus MRI

Brachial plexus MRI showed constriction of right C5 extraforaminal nerve root, 1 cm from the insertion to the upper trunk (white arrow).

Table 1. The results of neurologic examination and electrophysiological study

	Category	Result
Neurologic examination	Motor strength (MRC grade)	Reduced motor strength of C5 myotome Shoulder flexor 4/5 Shoulder abductor 4+/5 Shoulder external rotation 4-/5 Elbow flexor 4/5 Supinator 4/5 Brachioradialis 4/5
	Sensory exam	Intact on both side
	Muscle atrophy	Marked atrophy of Rt. brachioradialis and Rt. deltoid
	DTR	Biceps jerk 0/2, Triceps jerk 0/2
	Sensory NCS	No electrophysiologic abnormalities
	Motor NCS	Reduced CMAP amplitude in Rt. axillary nerve
Electrophysiologic study	Needle EMG	Spontaneous activity Denervation potential in Rt. D, Rt. supinator
	MUAP	Neuropathic MUAP potentials in Rt. D, Rt. BB, Rt. BR, Rt. ECR, Rt. supinator, Rt. RM, Rt. SA

Abbreviations: MRC; Medical Research Council, DTR; Deep Tendon Reflex, NCS; Nerve Conduction Study, EMG; Electromyography, CMAP; Compound Muscle Action Potential, MUAP; Motor Unit Action Potential, D; Deltoid, BB; Biceps Brachii, ECR; Extensor Carpi Radialis, BR; Brachioradialis, RM; Rhomboid major, SA; Serratus anterior

Conclusion

- This case highlight hourglass-like constrictions can occur in the brachial plexus.
- Clinical manifestation of hourglass-like constriction neuropathy includes acute and severe pain and following muscle weakness and atrophy in upper extremities, and **could overlap with that of neuralgic amyotrophy**.
- It is controversial whether the two are different disease entity or hourglass constriction is a possible etiology of neuralgic amyotrophy.
- In any case, clinicians should keep in mind that hourglass-like constrictions can occur in the brachial plexus and should consider it as a possible cause of brachial plexopathy.