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CASE REPORT

Brown-Sequard syndrome from cervical disc herniation, a case report and review of literature

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Abstract

This is the report of a 63-year-old woman presenting with Brown-Sequard syndrome due to spontaneous extradural C5-6 cervical disc herniation. Anterior discectomy was performed with favorable outcome. Review of literature show that the reported cases mainly involve paracentral disc at C5-6 level, with good surgical outcome.

INTRODUCTION

The combined neurological disorders involving ipsilateral weakness, impaired proprioception and vibratory sensation with contralateral loss of pain and temperature sensation is known as Brown-Sequard syndrome. The syndrome was first reported in 1849 in a case of spinal cord injury by a knife.[1] Other reported cases included spinal cord tumor, spinal vascular malformation, cervical spondylosis, and radiation injury.[2] Spontaneous spinal disc herniation as a cause of the syndrome was rarely reported. This is the report of such a case with review of literature.

CASE REPORT

A 63-year-old housewife with well-controlled essential hypertension and diabetes, who had neither previous history of cervical radicular pain, nor spinal injury such as from repeated weight loading on the cervical region, presented to our service. The patient had an acute and episodic radicular pain on her left scapular with radiation along her left upper limb 8 days prior to her visit. On the following day, hemianesthesia developed from her right toes and progressed to the groin in association with left lower limb weakness. Bowel and bladder functions were intact.

On neurological examination, there was decreased pinprick sensation of the right half of her body up to the T4 dermatome level. Proprioceptive and vibratory sensations were impaired in her left lower limb. Motor examination revealed total paralysis of her left lower limb with mild left upper limb weakness. Generalized hyperreflexia was detected. Both Hoffman's and Tromner's signs were elicited on the left side. There were bilateral extensor plantar responses.

The MR imaging of the cervical spine revealed a central C5-6 disc herniation, with hypersignal intensity of the corresponding cervical cord on the T2-weighted image. There was central cervical canal stenosis. The posterior longitudinal ligament was intact. (Figure 1)

The patient underwent anterior discectomy with plate fixation bridging the C5 and C6 spine without post operative complication. One month later, her left leg weakness improved to grade 2/5. Diminished level of pinprick sensory loss limited in her right leg with generalized hyperreflexia remained. All the neurological deficits completely disappeared within 6 months after the operation.

DISCUSSION

The herniated cervical disc can manifest as cervical musculo-skeletal syndrome (6%), purely radicular form (45%), purely spinal cord form (24%) and combined radicular and spinal cord form (25%). Purely spinal cord form is common in acute cervical dics herniation, while purely radicular and combined radicular and spinal form is more frequently seen in chronic cases.[3]

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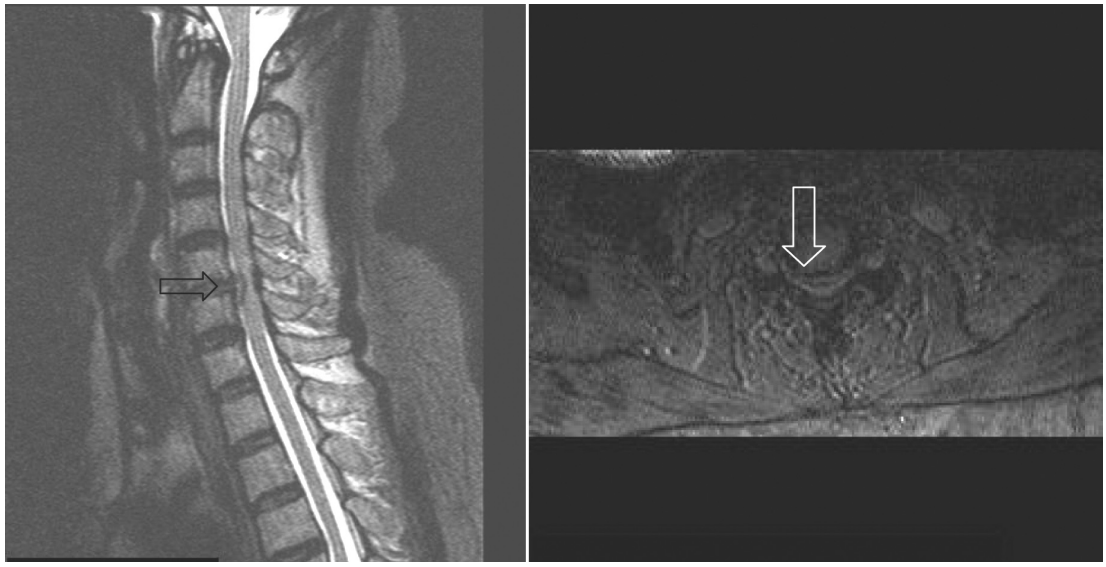

Fig. 1 Saggital and axial T2-weighted images demonstrate C5-6 intervertebral disc herniation with slightly increased intramedulary signal intensity, representing myelopathy.

Author	Sex	Age	Disc level	Disc location	Duration	MRI: high signal	Compression type	Outcome	Surgical approach	Trauma
Rumana[2]	F	56	C4-5	Paracentral	5 mths	Absent	Extradural	CR	Anterior	?
Borm[5]	M	40	C5-6	Paracentral	5 weeks	Absent	Intradural	CR	Anterior	Yes
Clatterbuk[6]	M	40	C4-5	?	5 weeks	ND	Intradural	MiSi	Anterior	No
	F	52	C3-4	Paracentral	2 mths	Absent	Intradural	CR	Anterior	No
	M	32	C5-6	Paracentral	9 weeks	Absent	Intradural	CR	Anterior	No
Stookey[7]	M	44	C3-4	Paracentral	NR	ND	Extradural	NR	Posterior	No
	M	52	C5-6	Paracentral	NR	ND	Extradural	NR	Posterior	No
	M	68	C6-7	Paracentral	NR	ND	Extradural	NR	Posterior	No
Durig[8]	M	52	C5-6	?	2 mths	ND	Intradural	MiSi	Posterior	Yes
Roda[9]	M	43	C6-7	Paracentral	1 day	ND	Intradural	MiSc	Posterior	No
Eisenberg[10]	M	25	C5-6	Paracentral	4 days	ND	Intradural	MiSi	Posterior	Yes
Schneider[11]	F	50	C5-6	Central	1 day	ND	Intradural	MiSi	Anterior	No
Sprick[12]	F	49	C6-7	?	10 days	?	Intradural	MiSi	Anterior	Yes
Finelli[13]	F	28	C5-6	Paracentral	18 mths	Presemt	Extradural	No change	Anterior	?
	M	61	C6-7	Paracentral	8 mths	Absent	Extradural	CR	Anterior	No
	F	46	C4-6	?	18 mths	Present	Extradural	CR	Anterior	?
Antich[14]	F	73	C2-3	Paracentral	6 mths	Absent	Extradural	CR	Anterior	?
Kohno[15]	M	33	C4-5	Paracentral	1 mth	?	Extradural	CR	Anterior	?
	M	31	C5-6	Paracentral	3 mths	?	Extradural	MiSi	Anterior	?
	M	38	C5-6	Paracentral	4 mths	?	Extradural	MiSi	Anterior	?
	F	45	C4-5	Paracentral	15 mths	?	Extradural	McSi	Anterior	?
Iwamura[16]	M	45	C6-7	Paracentral	15 mths	?	Extradural	McSi	Anterior	?
Kobayashi[17]	M	64	C5-6	Paracentral	6 mths	?	Extradural	CR	Anterior	No
	M	39	C2-3	Paracentral	1 mth	?	Extradural	CR	Anterior	No
Mastronardi[18]	M	36	C5-6	Paracentral	9 mths	Present	Extradural	CR	Anterior	?
Sathirapanya	F	63	C5-6	Central	8 days	Present	Extradural	CR	Anterior	No

M: male, F: female, ND: not done, ?: not reported , M: motor function , S: sensory function,
i: improved , c: complete resolution, CR = complete recovery

Table 1: Reported cases of Brown-Sequard syndrome by cervical disc herniation

Frequent inappropriate maneuver, neck position and neck movement can induce repeated microtrauma and consequently lead to disc herniation in a preexisting degenerated disc. The resultant compression of the spinal cord, and secondary vascular ischaemia result in myelopathy. A stenotic spinal canal also predisposes to cord damage from the herniated disc as in our patient.[4]

We reported a patient with spontaneous cervical disc herniation resulting in Brown-Sequard syndrome. The association between Brown-Sequard syndrome and herniated cervical disc is rarely reported in the medical literature. We encounter only 25 patients in the literature review. The salient features of the reported cases are summarized with our patient and listed in Table 1. As shown, they were mainly males (65%), with mean age of presentation of 46 years (31-73). The levels involved were C5-6 (46%), C6-7 (19%) and C4-5 (15%). In close to 90%, the disc was paracentral, and in in most cases, the compression was extradural. On the other hand, all the 4 cases with trauma history had intradural compression. Other than the case with long duration of symptom of 18 months from Finell[13], the outcome from surgical treatment was good. Half of the patients had complete recovery, and the others with partial improvement.

The constellation of the symptoms and signs in Brown-Sequard syndrome is caused by the unilateral involvement of the ipsilateral corticospinal tract, posterior column and spinothalamic tract of the spinal cord. The symptoms were probably due to the bulging disc against the origin of the corona branch of the spinal artery on the hemicord.

In conclusion, cervical disc herniation is an uncommon cause of Brown-Sequard syndrome. Early diagnosis and surgical treatment lead to a favorable neurological outcome.

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