

# Brown-Sequard Syndrome Caused by Cervical Disc Herniation

Chih-Hsiu Wang, Chun-Chung Chen, Der-Yang Cho

Department of Neurosurgery, China Medical University Hospital, Taichung, Taiwan, R.O.C.

Brown-Sequard syndrome caused by a herniated cervical disc is rare. We report a 44-year-old male patient who presented with left limb weakness and diminished sensation to pain and temperature on his right side below the C4 dermatome. A large protruding disc on the left side of the C3-4 disc space with cord compression was present on MRI. Brown-Sequard syndrome caused by herniated cervical disc was diagnosed. The patient underwent microdiscectomy and anterior cervical fusion by polyetheretherketone (PEEK) cage containing a core of biphasic calcium phosphate ceramic (triosite). Postoperatively, motor and sensory function returned to normal. Characteristic findings of discogenic Brown-Sequard syndrome are 1) contralateral deficit in sensation of pain and temperature of more than a few levels below the level of cord compression and 2) paracentral protrusion of the disc with cervical spinal stenosis. Early surgical intervention is always recommended. ( *Mid Taiwan J Med* 2006;11:62-6 )

## Key words

Brown-Sequard syndrome, cervical disc herniation, surgical decompression

## INTRODUCTION

Brown-Sequard syndrome involves ipsilateral loss of motor function due to corticospinal tract compression, combined with contralateral loss of sensation of pain and temperature caused by spinothalamic tract dysfunction. The most frequent causes of this syndrome are traumatic injuries to the spinal cord and spinal cord tumors (metastatic or intrinsic). Herniation of a cervical disc has rarely been considered to be a cause of Brown-Sequard syndrome. We report a case of C3-C4 herniated cervical disc causing a severe left hemicompression of the spinal cord, resulting in Brown-Sequard syndrome.

## CASE REPORT

A previously healthy 44-year-old man developed left upper limb weakness one month

prior to presentation. During the one-month period, the weakness extended to include the left lower limb. Motor examination revealed weakness of the left arm and a weakness and spasticity in the left leg, with stiff gait. On neurological examination, the man presented with diminished sensitivity to pain and temperature in the right arm and leg, with a sensory level beginning at C4. On deep tendon reflex examination, a reduction of the left biceps reflex and a hyper-reflexia of the left lower extremity were noted. The plantar response was extensor on the left side.

Magnetic resonance imaging of the cervical spine showed a large left extradural paramedian C3-C4 disc herniation, with cord compression (Fig. 1). A standard microsurgical anterior approach to the C3-C4 interspace was used, and a discectomy was performed. A large amount of disc material was herniated posteriorly, compressing the left spinal hemicord and the left C3 nerve root. After a complete decompression of neural structures, an interbody fusion was

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Address reprint requests to : Chun-Chung Chen, Department of Neurosurgery, China Medical University Hospital, 2 Yuh-Der Road, Taichung 404, Taiwan, R.O.C.

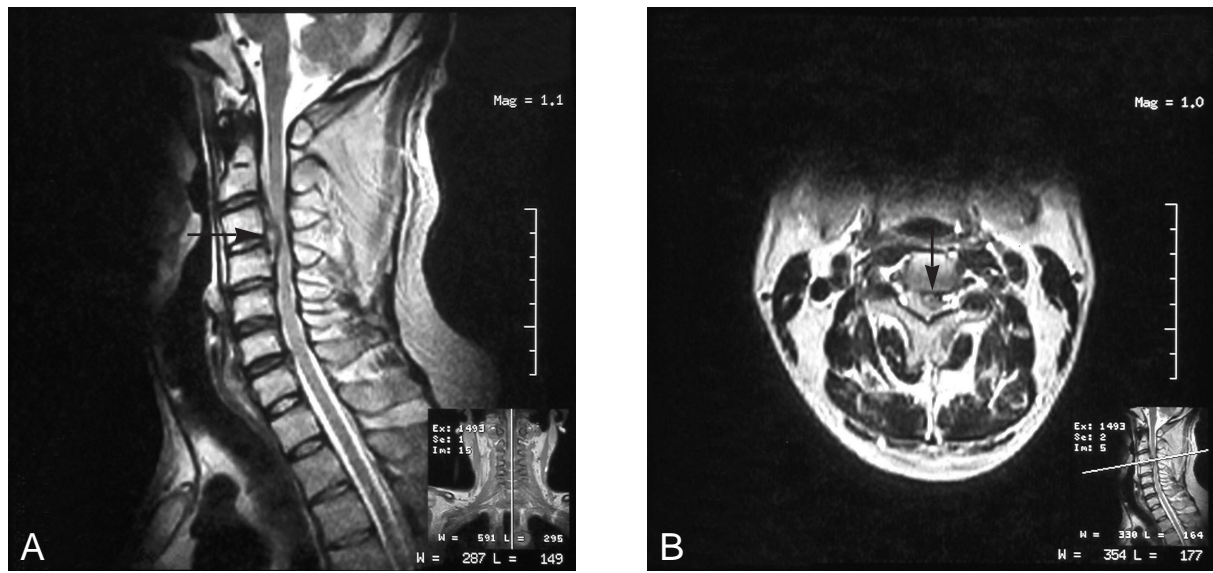


Fig. 1. Preoperative MRI shows a large left extradural paramedian C3-C4 disc herniation, with cord compression. A: Sagittal view. B: Axial view.



Fig. 2. Postoperative X-rays show interbody fusion with a polyetheretherketone (PEEK) cage.

performed with a polyetheretherketone (PEEK) cage (Stryker) containing a core of triosite (Zimmer) [1,2]. Before the closure of the superficial layers, an intraoperative lateral radiograph control was taken, and the correct position of the implant was checked. After the

operation, the patient remained in a rigid cervical collar for 4 weeks.

The postoperative course was satisfactory. His weakness and both sensation of pain and temperature had recovered completely one month after surgery. The postoperative MRI and X-rays showed total decompression of the cord and roots and interbody fusion with the polyetheretherketone (PEEK) cage (Fig. 2).

#### DISCUSSION

Only a few cases of Brown-Sequard syndrome produced by cervical disc herniation have been published since 1928. However, cervical disc herniation is a common disorder. Large paracentral disc herniation with severe hemicord compression is also not unusual. We believe that Brown-Sequard syndrome produced by cervical disc herniation is not rare and is often underdiagnosed.

The first characteristic finding of discogenic Brown-Sequard syndrome is contralateral deficit in sensation of pain and temperature. This is an obscure perception and is often ignored by patients themselves. Without this chief complaint, physicians can detect the deficit only by very detailed neurological examination. However, there are many reasons why physicians

skip detailed neurological examinations to a brief one.

Hemiparalysis without significant cervical symptoms is the first reason. In our patient, the initial presentation was hemiparalysis without neck pain. This symptom pointed to a supratentorial cerebral vascular accident. However, when the brain MRI showed normal findings, we revised our neurological examination and found contralateral analgesia and thermesthesia. Brown-Sequard syndrome caused by cervical lesion was suspected. Cervical MRI then confirmed the diagnosis of discogenic Brown-Sequard syndrome.

Severe and definite radicular sign is another reason. When patients come to the clinic with severe pain and paresthesia of neck and limb, they are quickly diagnosed as having cervical disc herniation with radiculopathy after the cervical MRI. However, contralateral deficit in sensation of pain and temperature may coexist but is often disregarded. This is a special condition, which needs to be evaluated. In the literature, half of the cases of Brown-Sequard syndrome produced by cervical disc herniation (12 of 24) had preceded or accompanied radicular signs and symptoms [3-11]. Pure Brown-Sequard syndrome is rare. Fragments of the syndrome plus additional symptoms and signs are more common [11].

The second characteristic finding of discogenic Brown-Sequard syndrome is paracentral protrusion of the disc with cervical spinal stenosis. In the literature, the location of the cervical disc herniation was paracentral in the majority of cases (22 of 24) [6-15]. When a paracentral protrusion of the disc with cervical spinal stenosis is noted from cervical MRI, the sensation of pain and temperature showed be evaluated.

The number of reports of Brown-Sequard syndrome produced by cervical disc herniation is increasing because of the easy application of MRI. Accurate diagnosis has made rapid operation and promising recovery possible.

Brown-Sequard syndrome produced by a cervical disc herniation is presumably often

underdiagnosed. Characteristic findings in most cases of discogenic Brown-Sequard syndrome are contralateral deficit in sensation of pain and temperature of more than a few levels below the level of cord compression and paracentral protrusion of the disc with cervical spinal stenosis. Outcomes are generally more favorable in patients for whom rapid diagnosis on MRI leads to spinal cord decompression treatment using surgical approach.

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## 頸椎椎間盤突出造成之Brown-Sequard Syndrome

王之秀 陳春忠 周德陽

中國醫藥大學附設醫院 神經外科部

我們提出一位44歲的男性病人被診斷出因頸椎椎間盤突出而造成Brown-Sequard syndrome。他的症狀包括左側肢體無力及右側頸椎第四皮節以下痛覺及溫度覺降低，核磁共振影像顯示在頸椎第三、四節間有一個很大的椎間盤突出壓迫左側脊髓。病人接受前位椎間盤切除、頸椎支架及人工骨椎體間融合手術後，運動及感覺功能恢復正常。因椎間盤突出造成之Brown-Sequard syndrome不易診斷，其特徵包括：1) 脊髓壓迫位置數節以下之對側痛覺及溫度覺降低，2) 椎間盤突出合併脊椎狹窄。由頸椎椎間盤突出造成之Brown-Sequard syndrome不易診斷，我們建議及早手術治療。(中台灣醫誌 2006;11:62-6)

### 關鍵詞

Brown-Sequard syndrome，頸椎椎間盤突出，手術減壓

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聯絡作者：陳春忠

地址：403台中市北區育德路2號

中國醫藥大學附設醫院 神經外科部

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