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## Brown-Sequard syndrome produced by calcified herniated cervical disc and posterior vertebral osteophyte: Case report

Dawei Guan<sup>a</sup>, Guanjun Wang<sup>a</sup>, Morgan Clare<sup>b</sup>, Zhengda Kuang<sup>a,\*</sup>

<sup>a</sup>Department of Spinal Surgery, General Hospital of Chinese People's Armed Police Forces, Beijing 100039, PR China

<sup>b</sup>College of Medicine, University of Florida, Gainesville, FL 32610, USA

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### ABSTRACT

Brown-Sequard syndrome (BSS) produced by cervical disc disorders has rarely been seen clinically and only 50 cases have been reported in English literatures. However, most of which have resulted from acute disc herniation. Here, we report a case of BSS produced by calcified herniated C4-C5 disc and posterior vertebral osteophyte, in which decompression through anterior approach was performed. This case revealed the potential of cervical spondylopathy leading to BSS in a chronic manner. Once the diagnosis is established, it is advisable to perform decompression as early as possible.

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Brown-Sequard syndrome (BSS) produced by hemisection of the spinal cord will lead to ipsilateral motor weakness, proprioceptive and vibratory sensation loss and is associated with contralateral deficit in sensation of pain and temperature. BSS is most commonly caused by injuries and neoplasms in the cervical and thoracic region.<sup>1–5</sup> BSS induced by disc disorders is rare; since the first published case in 1928, only 50 cases have been reported in English language literatures.<sup>6–10</sup>

This case is the 51st published discogenic BSS, which is produced by calcified herniated C4-C5 disc and posterior vertebral osteophyte. Contrast to previous cases with acute progression, features of BSS took place 7 years after the onset of initial radicular symptom in a quite chronic manner.

This 53-year-old male patient had a 7-year history of mild pain and numbness in the left arm. During the 6 months before

admission, he had experienced progressive weakness in the left arm and leg, along with contralateral deficit in sensation of pain and temperature below T11.

Upon physical examination, features of BSS were shown, including ipsilateral weakness in the left arm and leg (MRC Grade 3/5), hypertonia and hyperreflexia in left lower extremity, as well as reduced contralateral sensation of pain and temperature below T11. In addition, Hoffmann sign, Babinski sign and ankle clonus test of the left side were positive.

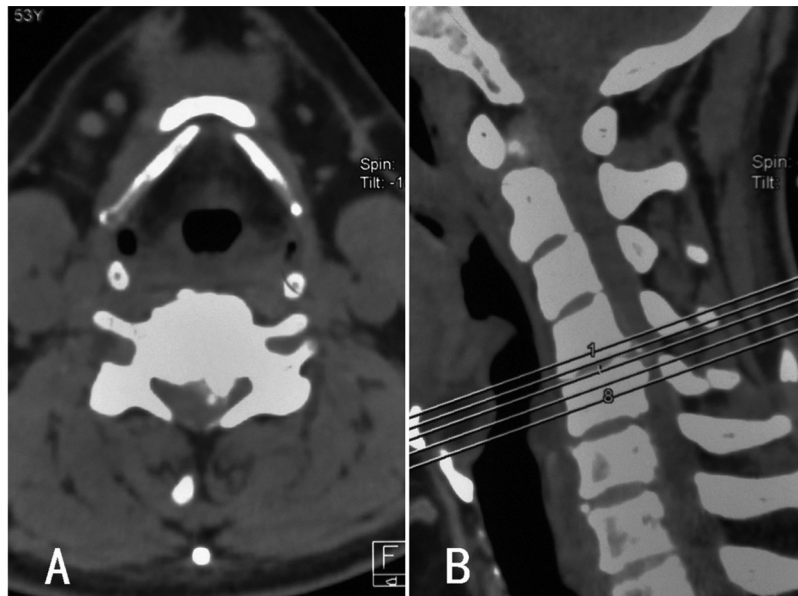
CT scan showed calcifications of herniated C4-C5 disc and posterior vertebral osteophyte of C5 (Fig. 1). MRI showed a large central left-sided C4-C5 disc herniation, compressing the spinal cord, leading to increased signal intensity on T2WI (Fig. 2). MRI of thoracic spine showed no positive result, eliminating disorders in the thoracic region (Fig. 3).

\* Corresponding author.

E-mail address: [kuangzd@sina.com](mailto:kuangzd@sina.com) (Z. Kuang).

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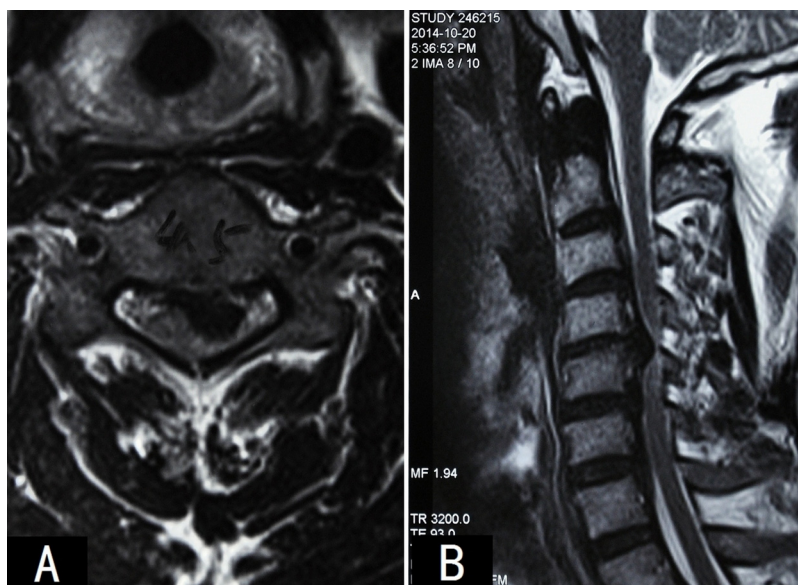
**Fig. 1 – CT. Calcification of left-sided herniated C4-C5 disc (A) and posterior vertebral osteophyte of C5 (B). To deal with the osteophyte, subtotal vertebrectomy and titanium mesh cages reconstruction were selected for decompression.**

Subtotal vertebrectomy of C5 and reconstruction using titanium mesh cages filled with autogenous bone were performed through anterior approach (Hybrid, Stryker) (Fig. 4). At the time of hospital discharge, pain and numbness in the left arm were almost completely relieved, with the left limb muscle strength improved to MRC Grade 4/5. Additionally, the contralateral sensory disorder of pain and temperature was alleviated about 60%.

This patient underwent a 7-year progression from initial symptom to the occurrence of BSS, differing from the acute manner of previous cases whose clinical histories ranged from several days to the longest of 15 months.<sup>11</sup> The longstanding

history resulted in calcifications of the herniated disc and posterior vertebral osteophyte which firmly adhered to the dural sac, increasing the risk and difficulty of decompression (Fig. 1).

In this case, the contralateral sensory deficit occurred below T11, over 10 segments distal to the level of compression at C4-C5. The inconsistency was a characteristic of incomplete BSS, which is more common than complete BSS.<sup>12,13</sup> Sensation of pain and temperature are transmitted through the spinothalamic tract, crossing the midline a few segments (1–3) above the entry. To distinguish the cause of contralateral sensory disorder, MRI of segments above the level of reduced sensation is needed.



**Fig. 2 – Cervical MRI. The herniated C4-C5 disc compressed left side of the spinal cord (A), consistent to the weakness in left limb and sensory deficit in the right side. Increased signal intensity on T2 weighted image (B) indicated severe spinal cord injury, which may lead to poor prognosis.**

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