Incomplete cauda equina syndrome presenting with acute urinary retention in the emergency department
在急症室呈現急性尿瀦留的不完整馬尾綜合徵

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Cauda equina syndrome (CES) is a rare but serious neurosurgical emergency that can have devastating long-lasting neurologic consequences. CES caused by herniated lumbar discs is rare in the literature. We report an unusual case of incomplete CES due to lumbar disc herniation. The patient presented to our emergency department with acute onset of low back pain, saddle (perineal) anaesthesia, urinary retention and constipation without motor deficit or sciatica. Magnetic resonance imaging (MRI) revealed a large herniated disc originated from the L5-S1 disc space with compression of the cauda equina. This case illustrates that patients with CES accompanying a disc herniation may not have all the characteristic features of CES such as pain radiating to the legs or muscle weakness. We recommend that urgent MRI assessment should be performed in all patients who present with sudden onset of urinary symptoms in the context of lumbar back pain or loss of perineal sensation. (Hong Kong J Emerg Med. 2010;17:498-501)

馬尾綜合徵是罕見但嚴重的神經外科急症，神經後果可以是持久及具破壞性。文獻中因腰間盤突出引致的馬尾綜合徵是罕見的。本文報告因腰間盤突出引致不完整馬尾綜合徵的一個不尋常案例。病人在急症室呈現急性下背痛、鞍（會陰）麻木、尿瀦留及便秘，但沒有活動能力缺失或坐骨神經痛。磁力共振造影顯示由L5-S1間有大的椎間盤突出，壓著馬尾。本案例說明伴有椎間盤突出的馬尾綜合徵病人，未必有馬尾綜合徵所有的特徵，如痛楚傳至腿部或肌肉無力。我們建議所有腰背或會陰失去感覺情況下而突然呈現泌尿症狀的病人，應緊急進行磁力共振造影評估。

Keywords: Intervertebral disk displacement, low back pain, polyradiculopathy, urinary retention

關鍵詞：椎間盤移位、下背痛、多神經根病、尿瀦留

Introduction

Cauda equina syndrome (CES) is an uncommon, traumatic or atraumatic compressive disorder of the lumbosacral nerve roots caudal to the level of spinal cord termination called conus medullaris. The syndrome may be caused by disc herniation, traumatic injury (e.g. gunshot wound, vertebral fracture), infection (e.g. discitis, vertebral osteomyelitis, epidural abscess), degenerative conditions (e.g. late-stage ankylosing spondylitis, degenerative spondylolisthesis,
spinal stenosis), metastatic or primary tumour and surgical complications (e.g. spinal epidural haematoma, use of fat graft for decompressive laminectomy, spinal anaesthesia, durotomy).\textsuperscript{1-3} Clinically, CES often presents with nonspecific symptoms that include acute low back pain, muscle weakness and bilateral or unilateral sciatica, partial or complete loss of bowel or bladder function and sexual dysfunction. Occasionally, urinary retention, incontinence of urine or stool, saddle (perineal) anaesthesia, decreased or absent anal sphincter tone, reduced or absent bulbo-cavernous reflex and gait disturbances are encountered that are the objective clinical findings of acute CES.\textsuperscript{4} Magnetic resonance imaging (MRI) is the diagnostic procedure of choice. The management of CES frequently needs prompt diagnosis and surgical decompression at the earliest opportunity.\textsuperscript{3} CES caused by herniated lumbar discs is rare in the literature and it accounts for up to 1\% of all disc herniations.\textsuperscript{6} Due to the emergent nature of CES and its rare presentation, controlled studies are not feasible and it is often reported in the literature as a case report or a retrospective chart review of cases.\textsuperscript{6,9} This is a case report of a patient with incomplete CES due to lumbar disc herniation at the L5-S1 intervertebral space presenting with acute onset of low back pain, saddle (perineal) anaesthesia, urinary retention and constipation in our emergency department.

**Case report**

A 38-year-old man who had transient discomfort in his left posterior back for one year attended our neurosurgery outpatient clinic in June 2009. On assessment, his general physical examination was unremarkable and routine laboratory tests were within normal ranges. There was no history of trauma, fever, weight loss, or any other systemic symptoms. He was treated with combined analgesic and muscle relaxant. After 24 hours, he was admitted to our emergency department (ED) because of new onset of severe low back pain, saddle anaesthesia, complete urinary retention and constipation. Palpation revealed extreme tenderness at the lumbosacral region. However, there was no pain radiating to his legs and motor strength was 5/5 in both legs. His back pain was refractory to opioid analgesics. A urethral catheter was inserted for urinary retention. The neurosurgeon, neurologist and urologist were consulted for loss of perineal sensation and acute urinary retention. The neurological examination disclosed absence of the left ankle reflex (S1), sensory loss in the perineal region including the dermatomes of S1-S5, absence of the anocutaneous (S3-S5) and bulbocavernosus reflexes (S3-S4). The examination findings of the patient suggested partial cauda equina syndrome. Further investigation with MRI showed a large hypointense mass at the L5-S1 disc space. The lesion demonstrated cauda equina compression on T1-weighted image (Figure 1). The patient underwent an urgent operation with decompressive laminectomy and discectomy. Perineal sensation gradually improved on the 15th postoperative day and he could defecate voluntarily together with a return of urinary sensation. He was able to micturate voluntarily with minimal residual urine one month post-surgery.

![Figure 1](image-url) Axial T1-weighted image through the L5-S1 level showing a large hyperintense disc fragment causing severe cauda equina compression (black arrow).
Discussion

In the thoracolumbar region, the spinal cord usually ends at the L1-2 level in adults and continues to the filum terminale and cauda equina. This region is anatomically divided into three segments namely the epiconus (L-4 to S-2), the conus medullaris (below S-3) and the cauda equina. The cauda equina is the sack of nerve roots at the lower end of the spinal cord. These segments present with characteristic neurological syndromes when affected by disc herniation, tumours, vertebral fracture, inflammatory conditions or other infectious aetiologies. The nerve roots composing the cauda equina provide the sensory and motor innervation of most of the lower extremities, the pelvic floor and the sphincters.

CES is a term applied to the clinical picture of perineal sensory loss with disorder of voluntary control of both anal and urethral sphincters as well as sexual responsiveness. Clinical signs accompanying CES may differ in different patients but traditionally, the full-blown syndrome is characterised by low back pain, bilateral or unilateral sciatica, saddle hypoesthesia or anaesthesia, motor weakness of lower extremities, impairment of anal, bulbocavernosus, mediopatellar or Achilles tendon reflexes bilaterally, rectal and bladder sphincter dysfunction, as well as sexual impotence. However, most patients do not present with all the characteristic features of CES. The most frequent symptoms at initial diagnosis of patients with CES are acute low back pain with unilateral or bilateral sciatica and unilateral or bilateral muscle weakness of the lower extremities. Perineal sensory loss is a sensitive and relatively specific sign in the diagnosis of CES.

The clinical course of our patient on admission was most likely to have involved an extruded disc at the L5-S1 intervertebral space migrating into the sacrum and causing low-back discomfort, followed by loss of perineal sensation and bladder dysfunction. Our case illustrates that patients with the cauda equina syndrome accompanying disc herniation may not have all the characteristic features of CES. There is a growing trend to order urgent MRI scan of the lumbar spine in any patient who presents with signs suspicious of CES.

MRI provides the optimal radiographic evaluation for characterising and localising acute cauda equina compression. The predictive values of clinical characteristics for suspected CES have been described recently by Domen et al. The authors concluded that urinary retention alone or in combination with two or more characteristic features of CES is the most important predictor of MRI-confirmed cauda compression. MRI scan was performed in our patient when CES was suspected based upon the neurological findings, especially in the setting of urinary retention. It showed a large herniated disc at the L5-S1 level with compression of the cauda equina.

CES is an emergent condition and it requires accurate diagnosis and surgical decompression of the spinal canal to prevent further neurological damage. Numerous experimental data and human studies have documented statistically significant data on the functional outcome based on the timing of surgical decompression. Classically, surgical decompression has been recommended within 48 hours after the onset of symptoms to offer the greatest chance for recovery of neurologic and bladder function. Several articles have demonstrated no correlation between the time to surgical decompression and recovery of neurologic and bladder functions. Even with these findings, although controversy regarding the outcome of CES from herniated lumbar discs still exists as to the timing of surgical decompression, most investigators suggest surgical decompression as soon as possible. Our patient was taken to surgery on the day he presented to the ED and made a satisfactory functional recovery.

Conclusion

Cauda equina syndrome is a rare but serious consequence of lumbar disc prolapse or herniation and it can have devastating long-lasting neurological deficits. We recommend that prompt evaluation and urgent MRI assessment should be performed in all patients who present with sudden onset of urinary symptoms in the context of lumbar back pain or loss of perineal sensation or motor abnormality of the lower extremity for diagnosing CES.
References