

(iv) Cauda equina syndrome

Takashi Kusakabe

Abstract

Cauda equina syndrome (CES) is a relatively uncommon but serious condition arising from a compressive lesion in the lumbar spine canal. This gives rise to a complex of symptoms including bladder dysfunction. The most common causes are disc herniation, tumour, abscess, haematoma, fracture and spinal stenosis. While clinical history and examination are important, diagnosis is usually made by imaging modalities such as MRI or CT myelography. Once diagnosed, emergency decompression surgery is necessary to prevent permanent neurological dysfunction.

Keywords bladder dysfunction; cauda equina syndrome; lumbar spine

Introduction

The cauda equina (Latin for 'horse's tail') is made up of a bundle of nerve roots lying caudal to the conus medullaris. Cauda equina syndrome (CES) is caused by compression of the cauda equina, most commonly disc protrusion. Mixer and Barr first described lumbar disc prolapse in 1934.¹ It gives rise to symptoms of low back pain, generally bilateral sciatica, variable lower extremity motor and sensory disturbances, saddle (perineal) sensory disturbance, and importantly bladder and bowel sphincter and sexual dysfunction. CES is relatively rare arising at any age but mainly in adults. It occurs in between 1% and 6% of all patients with lumbar disc herniation undergoing surgical treatment.^{2–4} In spite of this low incidence, it has a disproportionately high medico-legal profile.^{5,6} Surgical treatment within a 48 h of the onset of symptoms is associated with improved outcomes,^{7,8} and thus it is one of the few spinal surgical emergencies. Unfortunately failure to fully record symptoms, incomplete documentation, failure to carry out a complete physical examination including a rectal examination, failure or delay in diagnosis, delay in obtaining imaging once diagnosed, delay in referral for or undertaking treatment when diagnosed and even discharging a patient without excluding the diagnosis mean that cauda equina syndrome has a disproportionately high medico-legal profile.^{5,6}

Aetiology of cauda equina syndrome

CES may be caused by any space occupying lesions that compresses cauda equina (Figures 1–4) in the lumbar canal such as lumbar disc herniation (Figure 1), tumours (metastases, lymphomas, spinal tumours) (Figure 2), infection (epidural abscess), haematomata (haemorrhages, post-operative haematoma), fracture, and lumbar spinal canal stenosis (including spondylolisthesis) (Figure 3). It may also follow a violent impact, such as a

car crash, a fall from significant height, or a penetrating injury, such as a gunshot⁹ or stabbing injury.

It must not be forgotten that in an ageing population, there will be an increasing incidence of lumbar spinal canal stenosis due to spondylosis and degenerative spondylolisthesis which can give rise to CES.

Clinical presentation

CES may present acutely or chronically. The most common symptoms are severe back pain (83%) and radiculopathy (90%).^{7,10} A clinical history should establish the nature and duration of the symptoms, and may indicate a possible aetiology. In particular any symptoms of bladder or bowel dysfunction should be carefully sought. While radicular symptoms may be present, of far greater importance in CES is saddle area (perineal) sensory disturbance (Figure 5) and urinary or rectal dysfunction. It must not be forgotten that the duration of symptoms from onset inversely correlates with the recovery of neurological function.

In acute CES, there is a sudden onset of severe back pain and there are sensory changes in dermatomal distribution with motor weakness, and possible urinary retention and/or incontinence, necessitating catheterization. Many patients report a recent episode of trauma, such as falls, motor vehicle accidents, weight-lifting, or chiropractic manipulations.^{2,8,11,12} Risk factors for other aetiologies such as previous spinal surgery, anti-coagulation, fevers, obesity should be identified.^{13–15}

Incidence of CES after lumbar spinal surgery has been reported to be 0.1–0.2%.¹³ Commonly closed-suction drainage has been used to prevent post-operative epidural haematoma in patients having lumbar spine surgery. However, only a few studies have addressed the efficacy of drain use, and they have questioned the benefit of drain placement in patients having lumbar spine surgery.^{14,16} The decision to use or not use a drain following lumbar spine surgery should be left to the surgeon's discretion.¹⁴ The time of presentation of neurologic deficits due to post-operative epidural haematoma can vary from several hours to several days. It may be associated with a bleeding diathesis, use of anticoagulants or other platelet-inhibitory medications, heavy alcohol use, or liver disease. Post-operative haematoma giving rise to CES has been described as starting with sharp peri-incisional pain, paraesthesiae, radicular pain, and bilateral neurologic deficits. If this is combined with abscess formation, there will also be a pyrexia.

Chronic CES is characterized by insidiously increasing back pain with gradual unilateral or bilateral sensory disturbance and/or motor weakness. Bladder and bowel dysfunction progresses gradually.^{2,8,10} Chronic CES often arises from lumbar spinal canal stenosis. Such cases often do not require emergency treatment but careful monitoring is essential to avoid progression to irreversible CES.³ The results of acute or chronic CES have not been shown to differ in terms of patient outcome.^{2,17}

While rectal sphincter dysfunction may be present, patients are more immediately aware of urinary dysfunction.³ This is more difficult to assess in a post-operative catheterized patient.¹³ Erectile dysfunction is an uncommon but is associated with a poor prognosis.

A careful neurological examination will assist in defining the level of the lesion and differentiate between complete and

Takashi Kusakabe MD PhD Chief Spine Surgeon, Department of Orthopaedic Surgery, Tohoku Rosai Hospital, Sendai, Japan. Conflicts of interests: none.

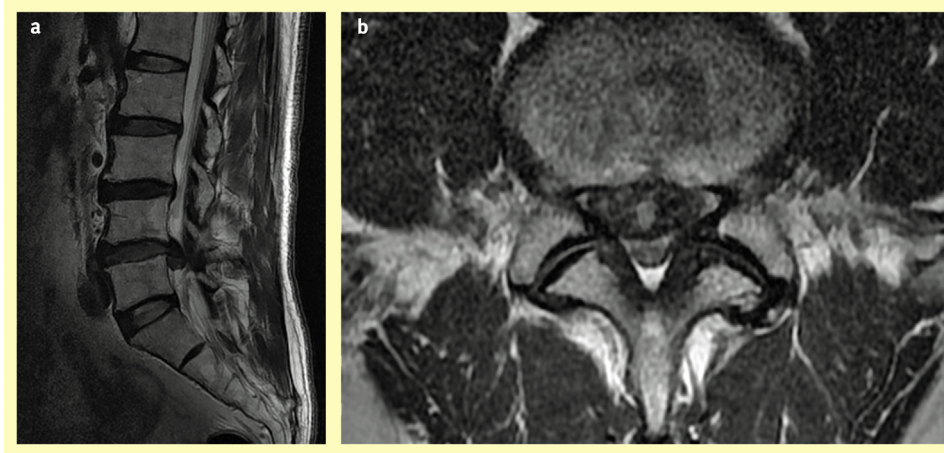


Figure 1 A 67-year-old male with acute incomplete CES. Sagittal (a) and axial (b) slices of T2-weighted MRI showing large lumbar disc herniation at L4/L5 level.

incomplete dysfunction. Most of patients with CES have an objective sensory disturbance in the lower extremities with numbness and weakness, and also have decreased perineal sensation.¹⁰ Deep tendon reflexes are usually diminished; most patients present with an absent Achilles tendon reflex. If hyper-reflexia and long tract signs are present it is indicative of a lesion above the L1–L2 disc, compressing the spinal cord rather than the cauda equina. There may be decreased sphincter tone on rectal examination.^{8,18}

Classification of cauda equina syndrome

CES can be incomplete or complete.³ Incomplete CES presents with motor and sensory changes including saddle anaesthesia, but without having developed the full picture of urinary or bowel or bladder sphincter function.³ Most cases of CES caused by

degenerative lumbar spinal canal stenosis fall into this category. Complete CES will have developed true retention characterized by painless urinary retention and eventually overflow incontinence.³ Usually urinary dysfunction follows on from pollakiuria (urinary frequency), but obviously this will not be recognized in a catheterized post-operative patient. Early recognition of CES is important as immediate decompression surgery prevents the progression of neurological deficits.¹⁹ If the presentation is of incomplete CES treated by surgical decompression, the ultimate prognosis is much better.³

Imaging and other investigations

Studies have shown that clinical findings alone are unreliable in establishing the diagnosis. Thus while a clinical diagnosis of CES may be made after history and physical examination; imaging

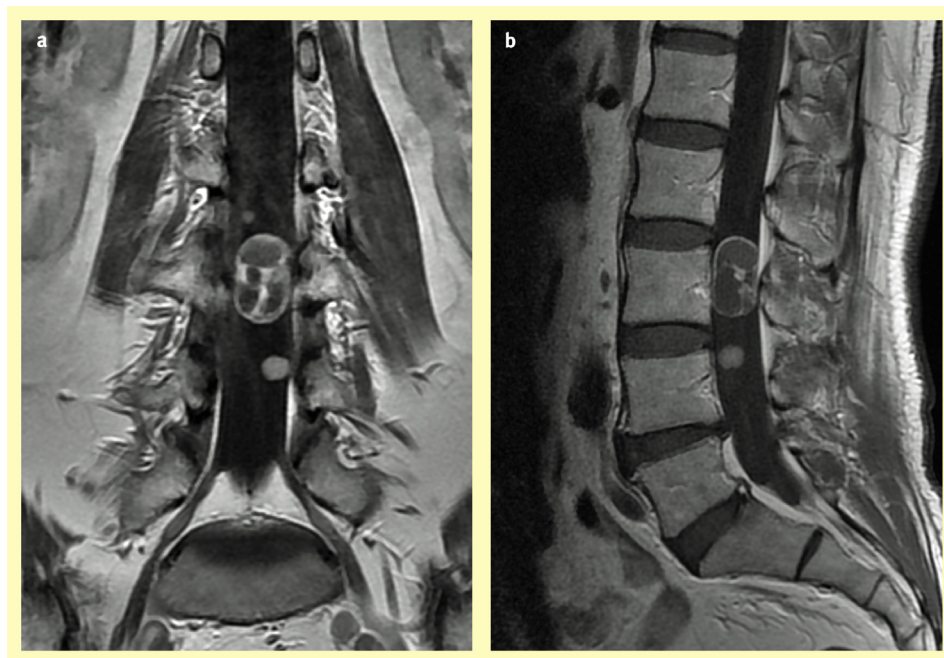


Figure 2 A 49-year-old male with chronic incomplete CES. Coronal (a) and sagittal (b) slices of gadolinium enhanced T1-weighted MRI showing cauda equina tumour (neurinoma) at L3 level.

Download English Version:

<https://daneshyari.com/en/article/4080137>

Download Persian Version:

<https://daneshyari.com/article/4080137>

[Daneshyari.com](https://daneshyari.com)