



American
Association of
Neurological
Surgeons

CAUDA EQUINA SYNDROME

PATIENT INFORMATION

This resource, developed by neurosurgeons, provides patients and their families trustworthy information on neurosurgical conditions and treatments.

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Low back pain affects millions of people every year and, in most cases, it improves without surgery. But severe back pain can be a symptom of a serious condition that is not well known and is often misdiagnosed. **Cauda equina syndrome** (CES) occurs when the nerve roots of the cauda equina are compressed and disrupt motor and sensory function to the lower extremities and bladder. Patients with this syndrome are often admitted to the hospital as a medical emergency. CES can lead to incontinence and even permanent paralysis.

The collection of nerves at the end of the spinal cord is known as the **cauda equina**, due to its resemblance to a horse's tail. The spinal cord ends at the upper portion of the lumbar (lower back) spine. The individual nerve roots at the end of the spinal cord that provide motor and sensory function to the legs and the bladder continue along in the spinal canal. The cauda equina is the continuation of these nerve roots in the lumbar region. These nerves send and receive messages to and from the lower limbs and pelvic organs.

Incidence

CES is not related to gender or race. It occurs primarily in adults, although trauma-related CES can affect people of all ages. CES affects a very small percentage of patients that have undergone surgery for lumbar herniated disc.

Causes

CES most commonly results from a massive herniated disc in the lumbar region. A single excessive strain or injury may cause a herniated disc. However, disc material degenerates naturally as a person ages, and the ligaments that hold it in place begin to weaken. As this degeneration progresses, a relatively minor strain or twisting movement can cause a disc to rupture.

The following are other potential causes of CES:

- Spinal lesions and tumors
- Spinal infections or inflammation
- Lumbar spinal stenosis
- Violent injuries to the lower back (gunshots, falls, auto accidents)
- Birth abnormalities
- Spinal arteriovenous malformations (AVMs)
- Spinal hemorrhages (subarachnoid, subdural, epidural)
- Postoperative lumbar spine surgery complications
- Spinal anesthesia

Symptoms and Diagnosis

CES symptoms mimic those of other conditions. Its symptoms may vary in intensity and evolve slowly over time. CES is accompanied by a range of symptoms, the severity of which depend on the degree of compression and the precise nerve roots that are being compressed. Besides a herniated disc, other conditions with similar symptoms to CES include peripheral nerve disorder, conus medullaris syndrome, spinal cord compression, and irritation or compression of the nerves after they exit the spinal column and travel through the pelvis, a condition known as lumbosacral plexopathy.

Patients with back pain should be aware of the following "red flag" symptoms that may indicate CES:

- Severe low back pain
- Motor weakness, sensory loss, or pain in one, or more commonly both legs
- Saddle anesthesia (unable to feel anything in the body areas that sit on a saddle)
- Recent onset of bladder dysfunction (such as urinary retention or incontinence)
- Recent onset of bowel incontinence
- Sensory abnormalities in the bladder or rectum
- Recent onset of sexual dysfunction
- A loss of reflexes in the extremities

Medical history implications:

- Recent violent injury to the back
- Recent lumbar spine surgery
- A history of cancer
- Recent severe infection

The following tests may be helpful in diagnosing CES:

- **Magnetic resonance imaging (MRI):** A diagnostic test that produces three-dimensional images of body structures using magnetic fields and computer technology. MRI produces images of the spinal cord, nerve roots and surrounding areas.
- **Myelogram:** A **myelogram** is an X-ray of the spinal canal following injection of a contrast material into the surrounding cerebrospinal fluid spaces; can show displacement on the spinal cord or spinal nerves due to herniated discs, bone spurs, tumors, etc.

Treatment

Once the diagnosis of CES is made, and the etiology established, urgent surgery is usually the treatment of choice. The goal is to reverse the symptoms of neural dysfunction. Left untreated, CES can result in permanent paralysis and incontinence.

Those experiencing any of the red flag symptoms should consult a neurosurgeon as soon as possible. Prompt surgery is the best treatment for patients with CES. Treating patients within 48 hours after the onset of the syndrome provides a significant advantage in improving sensory and motor deficits as well as urinary and rectal function. But even patients who undergo surgery after the 48-hour ideal time frame may experience considerable improvement.

Although short-term recovery of bladder function may lag behind reversal of lower extremity motor deficits, the function may continue to improve years after surgery. Following surgery, drug therapy coupled with intermittent self-catheterization can help lead to a slow but steady recovery of bladder and bowel function.

Coping with CES

CES can affect people both physically and emotionally, particularly if it is chronic. People with CES may no longer be able to work, either because of severe pain, socially unacceptable incontinence problems, motor weakness and sensory loss or a combination of these problems.

Loss of bladder and bowel control can be extremely distressing and have a highly negative impact on social life, work and relationships. Patients with CES may develop frequent urinary infections. Sexual dysfunction can be devastating to the patient and his/her partner and may lead to relationship difficulties and depression.

Severe nerve-type (neurogenic) pain may require prescription pain medication with side effects that may cause further problems. If the pain is chronic, it may become "centralized" and radiate to other areas of the body. Neurogenic pain tends to be worse at night and may interfere with sleep. This type of pain tends to produce a burning feeling that can become constant and unbearable. Sensory loss may range from pins and needles to complete numbness, and may affect the bladder, bowel and genital areas. Weakness is usually in the legs and may contribute to problems walking.

It is essential that people with CES **receive emotional support** from a network of friends and family members, if possible. It is important to work closely with your physician on medication and pain management. There are several medications prescribed to address pain, bladder and bowel problems. In addition, some patients find that physical therapy and psychological counseling help them cope with CES.

The AANS does not endorse any treatments, procedures, products or physicians referenced in these patient fact sheets. This information is provided as an educational service and is not intended to serve as medical advice. Anyone seeking specific neurosurgical advice or assistance should consult his or her neurosurgeon, or locate one in your area through the AANS' Find a Board-certified Neurosurgeon™ online tool.