



## Cauda Equina Syndrome

The term cauda equina refers to the peripheral nerves which have left the spinal cord at approximately the level of the first lumbar vertebra. At that level, the structure of the spinal cord itself ends and the nerves going to the pelvis and the lower extremities continue through the spinal canal, leaving the spinal canal in pairs to the right and to the left as they pass to the pelvis and the lower extremities. Significant pressure obstructing the spinal canal at any level from L1 downward can cause cauda equina syndrome (CES). The pressure which develops in the canal comes on acutely or in some cases subacutely, which is to be contrasted with spinal stenosis which has a much more gradual onset of symptoms. (See Online Orthopaedics article on spinal stenosis.)

### Causes:

Some of the causes of CES are traumatic injury to the lower back, very large central disc protrusion, and invasion by tumor spread from somewhere else in the body. The midline prolapse of an intervertebral disc at L4-L5 is by far the most common cause of CES.

### Symptoms:

Some of the important symptoms of cauda equina syndrome are lower back pain, pain extending down one or both lower extremities, numbness in the buttock area around the rectum, weakness in the lower extremities, and bowel or bladder dysfunction. This could include difficulty in initiating urination or incontinence and bowel dysfunction could include constipation or fecal incontinence. Unfortunately, in older patients who are often confined to bed or chair, alteration in bladder and bowel function does not seem unusual and the diagnosis of CES can be overlooked if a careful physical examination is not performed.

The degree of symptoms certainly can be variable and not every patient has all of the symptoms. While symptoms can often arise acutely, sometimes there is a slower onset.

The condition can even arise in a patient who has not had previous significant lower back pain.

There seem to be three separate groups of patients with regard to onset of symptoms.

In Group I, the symptoms arise suddenly without previous history of back ache.

In Group II, there was an acute onset of difficulty voiding urine following a long history of lower back pain.

In Group III, CES arose gradually from a background of lower back pain and sciatica.

Diagnosis is confused and delayed and often difficult because some of these patients are confined to bed mostly and problems with bladder function often are not considered



unusual in these patients. Older male patients often have trouble with their prostate or even have a urinary catheter in place. The diagnosis is often missed at the initial evaluation because lower back pain is such a common and generally benign condition.

### **The diagnosis of cauda equina syndrome by imaging studies**

Conventional x-rays of the lower back are, as always, the foundation of any other radiologic evaluation. In addition, MRI and CT imaging not only help in determining where the changes are in the lower back (level of pathology) but also assist in the diagnosis of the primary problem, whether it be disc, tumor or some other cause.

As important as the imaging studies are, the diagnosis of cauda equina syndrome must be based on a clinical examination primarily.

### **Outcome:**

The majority of spinal surgeons feel that early operative decompression of the spinal segment (s) is imperative for a favorable outcome in the treatment of CES. There is no uniform agreement as to what the optimal time is for decompression. Some authors have demonstrated excellent return of function with decompression up to three days following presentation of symptoms. Other authors, in their studies, have indicated that satisfactory results can come only if decompression is done within 14 hours of onset of symptoms. Early decompression of the nerves in the spine seems to prevent the progression of the syndrome and thereby promote early return of function to the bowel, bladder, and lower extremities.

The most common level of compression is at L4-L5. The sacral nerve roots seem to be the more affected, especially the lower roots, which are responsible for function of the bladder and the bowel.

### **Summary:**

Cauda equina syndrome is an uncommon condition but is devastating when it occurs. It may arise secondary to traumatic injury, spondylosis (arthritis), metastatic disease (malignant tumor which has spread to the spine), and most commonly following lumbar disc herniation.

Although there is not uniform agreement regarding exact timing, the value of early decompression spinal surgery continues to be recommended.



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## **Thomas J. Haverbush, MD. P.C.**

**Office Address:**

315 E. Warwick Dr., Suite A  
Alma, Michigan 48801  
989-463-6092  
Fax 989-463-8914

**Website Address:**

[www.orthopodsurgeon.com](http://www.orthopodsurgeon.com)