

CAUDA EQUINA SYNDROME

CASE STUDIES

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INTRODUCTION

Cauda Equina Syndrome (CES) is the most severe of the many nerve compression syndromes that occur in the lumbar spine. Its clinical presentation is what differentiates it from other lumbar syndromes. The signs and symptoms are dependent upon the level, the severity of the myelopathy, and the acuteness of its onset.

DEFINITION

Cauda Equina Syndrome is a pelvic visceral dysfunction associated with compression of the cauda equina¹.

EXPLANATION

The syndrome can present as acute or chronic, partial or complete, at a high lumbar level or at the lumbosacral junction. If the compression is at the lumbosacral junction, the only findings will be perineal numbness, pelvic floor paralysis, dysfunction of bowel and bladder, and loss of sexual function. If the compression of cauda equina takes place at a higher level in the lumbar spine, then partial or complete paralysis of the legs may also be present.

- Aetiology – commonly because of:
 - * massive disc herniation, often in a narrow canal (acute)
 - * severe spinal stenosis from any cause (chronic)

PATIENT PRESENTATION

- Acute Cauda Equina Syndrome
This may be caused by many different compressive lesions of the cauda equina. These include tumours, infections, fractures and disc herniations. The highest incidence is found to be due to massive disc herniation, often in a narrow spinal canal². The majority of lesions at L4/5 and L5/S1

Acute is classified into 3 groups:

Group I – sudden onset – no premonitory symptoms, no warning

Group II – previous history of sciatica and back pain prior to acute onset of urinary retention i.e. pelvic visceral paralysis

Group III – back pain and sciatica, unilaterally or bilaterally – after short interval develop urinary retention³.

The difference between Groups II and III is the time span before urinary retention involvement.

- Chronic Cauda Equina Syndrome

The patient is usually middle-aged or older, with no specific history of injury. In the stenotic patient there is a gradual onset of symptoms over months or years due to the slowly diminishing volume of the spinal canal. These are:

- * urinary incontinence, hesitancy or urgency
- * sciatica and backache for many years
- * pseudo-claudication
- * perianal or perineal pain associated with neurogenic bowel or bladder dysfunction

PHYSICAL FINDINGS

- Acute CES
Always includes:
 - * numbness in distribution of sacral roots ie sole of feet, buttocks, perineum, scrotum, labia, clitoris.May include:
 - * various degrees of diminished sensation in the legs and feet (depending on) level of obstruction
 - * absence of the anal reflex and bulbocavernosus reflex
 - * weakness of lower extremities
 - * severe bladder paralysis without leg pain symptoms
 - * unilateral leg signs
 - * bladder distention
 - * altered lower extremity reflexes and muscle strength
 - * bilateral positive SLR test
- Chronic CES (more subtle)
 - * rectal tone may be diminished
 - * sensation may be altered in the perineum (less than in the acute CES)
 - * lower extremity neurological findings may be present only with provocative testing such as walking and spinal extension

INVESTIGATIONS

- Acute CES
 - * water soluble myelogram (to determine level and extent)
 - * post myelogram CT
 - * MRI provides same information as myelography

- * urodynamic studies – for prognosis
- Chronic CES
 - * thorough neurologic workup
 - * complete neurologic assessment
 - * myelogram with post-myelographic CT
 - * urologic assessment – intravenous pyelogram
 - * electro-diagnostic sphincter function
 - * urodynamic testing
 - * tests of renal function

SURGICAL TREATMENT

Decompression is indicated when the neural elements are involved centrally and/or laterally because long term compressive factors are injurious to the neural elements.⁴ Surgical decompression takes the form of a wide laminectomy for the canal elements of the cauda equina, and foraminotomy for the lateral nerve root decompression, or a combination of these.

- In the acute syndrome:
The nerve roots are severely traumatised by the compression and the surgical procedure is considered to be urgent.

Even after decompression, the end result of acute cauda equina episodes show that the patient seldom recovers completely.

Residual bladder dysfunction is the rule, whatever the timing of surgical decompression. When rectal and anal dysfunction occurs the patient must, as with bladder dysfunction, learn to adjust.

If saddle anaesthesia persists following decompression, then pelvic visceral function will remain severely disturbed.

Bilateral sciatica is also considered to have a poor long term prognosis.

- In the chronic syndrome:
The surgical procedure is the decompression of both central and lateral canals at the appropriate level or levels.

Results of chronic cauda equina episodes normally show a slow recovery over approximately a year. It is usually incomplete but has a greater potential for the reversibility of the signs and symptoms than the acute syndrome.

PHYSIOTHERAPY AFTER DECOMPRESSION

Aim: Mobilisation of the neuro-muscular-skeletal system.

When the compressive factors and,

therefore, the primary causative factors have been removed/reduced surgically, physiotherapy aims at relieving the secondary compensatory symptoms of pain and limitation of movement throughout the neuro-muscular-skeletal systems.

Respecting the degree of recovery, and using the resultant neurological manifestations as a yardstick, the general approach by manual therapy is the sequence of passively

- * mobilising intervertebral joints
- * releasing soft tissue structures
- * stretching neural tissue.

Physiotherapy aims to treat pain first to prepare these structures for the phase of actively maintaining what has been passively achieved.

CASE PRESENTATION 1

- Acute Cauda Equina Syndrome (Disc Herniation)

Forty-year-old male with past history (8 years) of chronic back pain and sciatica, probably due to years of rugby and aggravated by years of driving (sales representative). No specific injury.

First consultation with doctor was 3 years ago – major complaints constant severe low back pain and sciatica on the right. He was hospitalised for 3 days on a programme of:

- * bed rest
- * symptomatic relief using spinal mobilisation techniques
- * medication.

He reported a marked improvement and with the assistance of a functional corset when driving, and oral analgesics when required, he kept going.

One year ago, as he bent forward and twisted to the right to pick up a light object, he coughed. He experienced severe lancinating pain in his back, followed immediately by severe radiating pain and weakness in both lower extremities, and bladder retention.

He was admitted to hospital immediately and within an hour a myelogram was performed. The myelogram revealed a complete block at the L4-5 level.

Surgery was performed 3 hours later with removal of an enormous fragment of disc material lying free within the spinal canal, and some partially extruded disc fragments from the interspace. Post-operatively, there was significant improvement in low back pain and sciatic pain, but the motor weakness of the right lower extremity persisted, necessitating a foot drop brace. He required a Foley catheter for 5 months after which he continued to have

urinary sphincter and persistent rectal sphincter impairment. For the bladder and bowel dysfunction, he was taught the long term management. Despite everything, he returned to his work one month post-operatively.

This case suggests that a severe and massive retropulsion of an intervertebral disc will probably traumatise the nerve roots so severely, or produce such permanent changes to the vascular supply of the cauda equina, that a serious residual effect will persist no matter how promptly the pressure is surgically relieved.

CASE PRESENTATION 2

- Chronic Cauda Equina Syndrome (Spinal stenosis)

Obese 56 year old housewife who fell onto her buttocks 2 years ago. She could get up but the following day developed severe back pain. This eased within a few days with bed rest, physiotherapy and analgesics.

She experienced intermittent low back pain over the following 8 months and developed a numbness from the waist down in association with rectal and urinary sphincter impairment. A myelogram revealed a complete block at L5-S1 with a smaller mid-line defect at L4-L5, for which surgery was recommended.

She declined, continued with physiotherapy, and the assistance of a functional corset and medication as required.

Nine months later she developed urinary incontinence and weakness of both lower extremities. She struggled on for another 4 months when she could avail herself for surgery.

Examination

- * loss of mobility of lumbar spine, particularly in flexion
- * severe lumbar para-spinal muscle spasm
- * saddle anaesthesia with numbness extending into both legs
- * SLR L=R-60°
- * both TA reflexes absent
- * anocutaneous reflex absent bilaterally.

Surgery

- * decompression laminectomy L4,5,S1
- * bilateral foraminotomy at L5-S1.

A Year Post-operatively

- * original severe pain in low back and both extremities had gone
- * numbness and weakness in both legs had completely gone
- * urinary incontinence improved - continued to experience urinary frequency

- * slight hypaesthesia to pinprick over sacrum and perineum and motor strength of both feet almost normal - fatigues

- * SLR L=R=80°.

This patient probably had a less acutely developing lesion which produced comparatively less trauma to the cauda equina and provided greater potential for reversibility. Despite the delay in treatment, she had a satisfactory result.

DISCUSSION

Case history 1 – demonstrates the classic presentation of a Group II ACUTE cauda equina syndrome ie the sudden onset of a massive disc herniation at L4/5 with immediate bladder involvement. Even after immediate decompression, he had serious residual dysfunction.

Case history 2 – is the classic presentation of a chronic cauda equina syndrome. Post-decompression recovery over approximately a year left her virtually pain free, with slight neural deficit, and functional.

CONCLUSION

Cauda Equina Syndrome presents as an acute or chronic compressive lumbar syndrome. It is a serious condition always involving the bladder and resulting in surgery. Most patients end up with a residual dysfunction and physiotherapy is essential to gain the maximum recovery available to the neuro-muscular-skeletal system.

References:

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