CAUDA EQUINA SYNDROME DUE TO LUMBAR DISC PROLAPSE. A CASE REPORT AND REVIEW

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A forty-nine-year-old man was admitted urgently at the request of his general practitioner. He gave two days' history of severe low back pain of acute onset precipitated by turning over in bed. This was associated with 'pins and needles' and numbness in the perineum, buttocks, back of the thighs, legs and feet with exacerbation of symptoms on coughing and sneezing. He had difficulty in micturition but was able to pass urine in small amounts.

Prior to admission he had suffered from low back pain without any sciatica for four weeks brought on by gardening. The symptoms improved after two weeks of physiotherapy treatment and he was able to go on a holiday. On his return he felt pain in his right leg but this was improving until the present episode. There was also a history of chronic recurrent low back pain with intervertebral disc prolapse at L5/S1 level in 1974 and further flare-ups in the 1980s. These were managed by conservative treatment.

Examination revealed a very stiff back with complete loss of lumbar lordosis and lower lumbar spinal tenderness. He had reduced perianal sensation but anal tone was intact. Bladder was not palpable and he was able to pass urine in small amounts. Straight Leg Raise was 70° on the right side and 60° on the left with positive Sciatic Stretch Test and positive Cross Leg Pain. Bowstring test was positive bilaterally. There was sensory deficit in L4 and L5 distribution. Knee reflexes were present but ankle reflexes were diminished.

Plain radiographs of the lumbar spine showed degenerative changes at L5/S1 level with reduced disc space and osteophyte formation consistent with a history of chronic low back pain. Disc spaces at other lumbar levels were well preserved. Routine blood tests including FBC, ESR, PSA and admission profile were normal.

Within hours of admission his clinical condition deteriorated significantly. He developed complete saddle anaesthesia with loss of anal tone and retention of urine. There was complete numbness in L4 and L5 distribution with power in dorsiflexors and inverters of ankle and extensor hallucis longus reduced to MRC grade 4. An unequivocal diagnosis of cauda equina syndrome was made and an urgent MR scan was arranged with a view to operating as soon as possible based on MR scan findings.

The MR scan showed a central disc prolapse at L3/L4 level with compression of the cauda equina and significant spinal stenosis.

Lumbar disc prolapse at L3/L4 with compression of cauda equina

Neurological deficit progressed at an alarming rate. Just before surgery, examination revealed grade 0-1 power in all groups of muscles at the ankle and foot in both lower extremities. At surgery a central disc prolapse was found at L3/L4 level with sequestered disc material pressing on the cauda equina and L4 and L5 nerve roots were under severe tension. Discectomy at L3/L4 level with limited spinal canal and nerve root canal decompression were performed to ensure there was no tension on the cauda equina and L4 and L5 nerve roots. Cord pulsations were absent at the start of the surgery but returned after discectomy and spinal decompression.

Clinical improvement was noticed within 72 hours of surgery. Within a week sensation in both lower limbs returned to near-normal and power in the right foot improved to grade 4+ but there was no recovery in the left foot. Bladder function returned to normal after five days. Ten days after surgery the patient was discharged home with normal bladder and bowel function, normal power in the right lower limb and grade 3 power in the left foot and ankle.

At six weeks' follow-up, the patient had no neurological deficit except slight numbness in the perineum and nerve root signs were negative. He had normal co-ordination and gait. His main concern was sexual dysfunction with reduced penile sensation and lack of complete erection but this was improving.

DISCUSSION

Cauda equina syndrome is a serious complication of lumbar disc prolapse. It is worth remembering that the syndrome has been precipitated by manipulation of the lumbar spine (13 cases reported between 1911 and 1992)⁽¹⁾. The syndrome can also be caused by a spinal tumour, spondylolisthesis, fracture dislocation, infections (including tuberculosis), rapidly progressive scoliosis and congenital abnormalities of the spine, including vascular malformations.

INCIDENCE

The cauda equina syndrome is relatively uncommon, accounting for approximately 2.5% (reported range 1-16%) of patients undergoing surgery for lumbar disc prolapse⁽²⁾.

CLINICAL PRESENTATION

The classic cauda equina syndrome has been described as a complex of low back pain, bilateral sciatica, saddle anaesthesia, and motor weakness in the lower extremities that may progress to paraplegia with bladder and bowel incontinence. Not all of the signs and symptoms of the syndrome are present in all cases. In fact unilateral sciatica (so-called unilateral cauda equina syndrome or hemi-cauda equina syndrome)⁽³⁾ can occur just as frequently as bilateral sciatica. Sometimes, by the time the patient is seen the back pain may have improved and pain in the legs may have been replaced by worsening numbness in the legs. This should not be taken as a sign of an improvement. All patients have bladder dysfunction, which is rare in a typical lumbar disc prolapse. Therefore, bladder dysfunction is an important distinguishing feature of the cauda equina syndrome.

The symptom complex is variable. A clinician may see only a few cases in his/her working career (the author has only seen five cases in the last 20 years). Therefore it is paramount that one is familiar with the various modes of presentation so that a prompt and accurate diagnosis can be made resulting in early surgical treatment. This way the disastrous complications of this condition can be minimised if not completely avoided.

There are two main modes of presentation^(2,4)

Acute with the sudden onset of severe back pain, sciatica, saddle anaesthesia, motor weakness in the lower extremities and, within hours, urinary retention necessitating catheterisation. These patients tend to be younger (average age 35 years, range 20-40 years). Some patients may give a history of minor trauma. The patients are often diagnosed and treated early (usually within 48 hours).

Subacute with relatively insidious onset, often with a history of recurrent episodes of back pain. Sciatica, motor and sensory loss, and bladder and bowel dysfunction develop over a few days or several weeks. These patients tend to be comparatively older (average age 40 years, range 35-55 years). The diagnosis may be delayed due to slower onset and failure to recognise bladder dysfunction. Previous history of back pain may mislead both the patient and the referring clinician who may not perceive the severity of the new symptoms.

Digital rectal examination and evaluation of perianal sensation are important for immediate diagnosis. Immediate radiological investigation, MR (preferred) or CT scan, is indicated. If disc prolapse is confirmed, surgery should be performed as soon as possible to stop further neurological deficit and to achieve the best possible outcome. In patients with coexisting spinal stenosis at the level of the disc prolapse, spinal decompression should be carried out at the time of discectomy to prevent postoperative neurological deterioration⁽⁵⁾.

OUTCOME

After surgery approximately 75% of patients recover normal bladder control within three to fourteen days. About 25% of patients will have partial recovery of bladder function with incomplete emptying. Approximately 25% of patients will experience some sexual dysfunction. Fifty percent of these may experience true impotence. Complete motor recovery can be expected in 90% of patients while over 80% of patients should make full sensory recovery.

PROGNOSTIC FACTORS

O' Laoire *et al*⁽⁶⁾, in a review of 29 patients, found that lower-limb pain was an important prognostic sign. The prognosis was less good in patients with bilateral sciatica than those with unilateral sciatica. The prognosis was especially poor in patients with no pain in the lower extremity as this led to a delay in diagnosis. However, they found no correlation between the outcome of surgical treatment and the presence or absence of any motor weakness, nor was there any correlation between the duration of symptoms prior to surgical treatment and the result of the treatment. Despite this lack of correlation, it is recommended that the surgery is carried out early and a partial cauda equina lesion should not be allowed to progress to complete loss of bladder and bowel control and paraplegia. As the present case showed the neurological deficit may progress at a rapid rate while the investigations are being carried out.

Scott⁽⁷⁾ noted a definite relationship between the degree of recovery of bladder function and the partial or complete sensory loss in saddle area. Patients who had complete perianal anaesthesia tended to have permanent paralysis of the bladder. This is an important observation that emphasises the need for a thorough testing of sensory changes in the saddle area, anal tone and bulbocavernosus reflex. There was no correlation, however, between other sensory, motor, and tendon reflex changes and the permanence of bladder dysfunction.

Lumbar neural segments have relatively large peripheral somatic distributions and can be evaluated readily by testing for reflex, sensory, and motor changes. The distributions of sacral neural segments are small by comparison and must be evaluated, primarily by demonstrating altered sensation in the perianal area. Further assessment of the sacral roots can be done by the relatively simple technique of cystometry. Urodynamic studies (cystometry) performed before and after the operation provide an accurate indication of bladder function. Aho *et al*⁽⁸⁾ followed sixteen patients by cystometry and concluded that true recovery of bladder function can only

be confirmed by this method. They also noted a correlation between the degree of saddle anaesthesia and recovery of bladder function, and observed that the prognosis for bladder function was better in patients with unilateral than in those with bilateral saddle anaesthesia.

Patients with rapid onset of symptoms tend to be more profoundly affected and have more severe disturbances of urinary and sexual function than do patients with subacute onset. There are, however, no differences in motor or sensory recovery in the two groups.

CONCLUSION

Cauda equina syndrome is a relatively uncommon complication of lumbar disc prolapse with frequent serious sequelae and needs prompt diagnosis and surgical treatment.

The symptom complex is variable and the clinician should be aware of different modes of onset (acute and subacute) in order to make a prompt diagnosis and to initiate early treatment. Unilateral sciatica (unilateral cauda equina syndrome) occurs just as frequently as bilateral sciatica.

The most important prognostic factors are completeness of saddle anaesthesia, unilateral or bilateral signs, and the mode of onset of the syndrome. Complete saddle anaesthesia, early retention of urine, bilateral sciatica and rapid onset of symptoms are associated with a bad prognosis. Assessment of perianal sensation is extremely important for the diagnosis and prognosis. Urodynamic studies are useful for diagnosis and monitoring the recovery of the bladder function after surgery.

Most studies have shown no difference in the motor or sensory recovery in patients undergoing surgery early (six to forty-eight hours) or later (up to five days). Prompt surgical management is, however, recommended to maximise the recovery and minimise the scar formation. While any

apparent delay in surgery may have medico-legal implications should the patient fail to recover completely, in the majority of cases the die is cast at the time of the disc prolapse.

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