Degenerative lumbar spine disease

Background

Degenerative lumbar spine disease (DLSD) is a condition in which the spinal canal or nerve roots become narrowed due to age-related changes in the spine. Imaging evidence of DLSD is present in 12 to 35 percent of the Western population, with 70 percent of those over the age of 70. The condition is more common in men than women. Most symptomatic patients are found to have one or more degenerative disks. In such cases, a herniated central lumbar disc is a possibility. In terms of aetiology, in most patients, degenerative disc disease is related to chronic overload. Other causes include congenital defects, infection, inflammation and rarer conditions.

Diagnosis of degenerative lumbar spine disease

The primary symptom of DLSD is pain, with a range of 12 to 35 percent in the Western world. Some people have chronic back pain, while others experience pain on walking or with coughing and sneezing. Intermittent back pain is common. Intermittent back pain is characterized by pain that is intermittent and does not interfere with normal activity, whereas chronic back pain is characterized by pain that is continuous and interferes with normal activity. Imaging tests such as X-rays, MRI scans, and CT scans are used to diagnose DLSD.

Central lumbar canal stenosis typically presents chronically and with signs and symptoms of multi-nerve root dysfunction, termed spinal stenosis. This patient has experienced pain in the back, leg, and buttock, and numbness and weakness in the lower extremities. This is a neurological emergency warranting urgent referral and treatment to avoid permanent neurological deficits. Lateral compression of a nerve root in the lumbar spine presents with characteristic dermatomal radicular pain, so-called “sciatica”, with associated lower motor neuron symptoms and signs.

In terms of investigations, imaging techniques are the most useful. Plain X-rays, especially performed in flexion and extension, will help to identify any spinal instability that may be present. The imaging modality of choice, however, is the MRI scan. MRI clearly demonstrates the neural elements and defines any areas of bony, ligamentous or disc degeneration and compression (see Figure 1). CT scans remain a useful alternative in patients who are unable to tolerate a MRI scan or in whom MRI is contraindicated, such as those with pacemakers. CT scans are also useful if detailed information about the bone structure is required, particularly in patients who are to undergo instrumented spinal fixation. Electrophysiological evaluation, such as nerve conduction studies, is helpful in determining the level of relevant pathology especially in patients with difficult clinical assessment and multi-level spinal disease on MRI.

Management of degenerative lumbar spine disease

Management of DLSD requires a multi-disciplinary approach comprising of, at least, neurosurgeons/spinal surgeons, a neuro-radiologist, pain specialists and physiotherapists. This is important to provide the patient with the most effective treatment for their particular symptoms. Although patients with DLSD may represent the biggest group of patients seen in a general neurological clinic, only a small proportion will ever need surgery.

In patients presenting with a acute/chronic isolated back pain, without neural compression or spinal instability, conservative measures are likely to settle the pain in the majority. Such measures include weight reduction; structured exercise programmes; analgesics such as paracetamol, non-steroidal anti-inflammatory drugs or opioids; physiotherapy; spinal manipulation by qualified osteopaths or chiropractors; and acupuncture. In patients with chronic pain (more than one year), epidural injections, transcutaneous electrical nerve simulation (TENS) and combined physical and psychological rehabilitation programmes may be of additional benefit. The role of surgery in such patients remains controversial. Spinal fusion may benefit selected patients. When instability (degenerative spondylolisthesis) complicates back pain, spinal fusion may achieve good pain control. Percutaneous spinal instrumentation systems now available, allow minimally invasive surgery with more rapid recovery and a shorter hospital stay.
In patients with DLSD and radicular pain, conservative measures are usually sufficient to improve the symptom in six to eight weeks. If severe pain persists beyond this time, or if a motor neurological deficit, such as a foot drop, is present, serious consideration should be given to surgery. The timing of surgery is particularly important if neurological recovery is to be achieved. The aim of surgery is to decompress the neural elements and the most common operations performed are lumbar laminectomy and lumbar microdiscectomy. The recent development of endoscopic microdiscectomy technique allows day-case local anaesthetic surgery with the additional benefit of excellent cosmetic results. Spinal cord stimulation remains an effective treatment in patients with severe pain especially if pain persists despite decompressive surgery.

**Prognosis of degenerative lumbar spine disease**

The prognosis of patients with DLSD depends on the underlying diagnosis, delivery of prompt treatment and psycho-socio-economic factors. Well motivated patients with a good social support network are more likely to recover well and resume work. Despite all the treatment available, some 10 percent of patients become chronically disabled, especially with back pain. In others, conservative and surgical measures are effective in improving the symptoms. Spinal stenosis and radicular pain respond well to surgery with up to 90 percent pain relief. When motor weakness is present or in patients with cauda equina syndrome, the timing of surgery is crucial in determining any neurological recovery with the best results seen in patients operated within 48 hours of presentation. The prognosis for recovery of sensory deficits such as numbness and paraesthesia is less predictable.

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