Degenerative lumbar spine disease

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Background

Degenerative lumbar spine disease (DLS) is a condition affecting the lumbar spine with or without neural compromise in the population. Imaging evidence of DLS is present in 20-30% of those over the age of 70. The symptoms however, are poor, with many asymptomatic patients. A significant proportion of patients with DLS have a herniated disc in the lumbar spine.

In terms of etiology, most patients of DLS are due to aging. Other causes include a congenital defect, infection, inflammation and rarer conditions.

Diagnosis of degenerative lumbar spine disease

The primary symptom of DLS is axial low back pain. The prevalence of back pain is high, with 12 to 35% of the Western world affected. It is a chronic condition, often leading to disability. Presenting features of DLS will depend on the nerves involved, neural compression and its rate of development.

Central lumbar canal stenosis typically presents chronically and with signs and symptoms of multi-nerve root dysfunction, termed spinal claudication. Thus patients complain of back pain with progressive leg pain, numbness and heaviness on walking with symptoms resolution at rest or on forward flexion. Intermittent claudication due to vascular insufficiency in the legs is an important differential diagnosis. Onset of central lumbar canal stenosis, usually due to a large herniated disc, may present with claudicating lower back pain. The red flag signs are: sphincter dysfunction with painless urinary incontinence and reduced anal tone, saddle numbness and bilateral sciatica. This is a neurological emergency warranting urgent referral and treatment to avoid permanent neurological defects. Lateral compression of a nerve root in the lumbar spine presents with characteristic dermatomal radicular pain, called "sciatica", with associated lower motor neuron signs and symptoms.

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 discal 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 instrumental spinal fixation. Electrophyiological 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 DLS is a multi-disciplinary approach comprising of at least a neurosurgeon/spinal surgeon, a neuro-radiologist, pain specialists and physiotherapists. This is important to provide the patient with the most effective treatment for their particular symptoms. Patients with DLS often represent the biggest group of patients seen in a general neurological clinic. A small proportion of patients will ever need surgery.

In patients presenting with a subacute or acute 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 spondyloolisthesis) 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.

Figure 1

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In patients with DLSS 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 defect, such as a foot drop, is present, surgical intervention 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 DLSS depends on the underlying diagnosis, delivery of prompt treatment and psycho-social-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% of patients become chronically disabled, especially with back pain. In others, conservative and surgical measures are effective in improving the symptoms. Spinal claudication and radicular pain respond well to surgery with up to 90% 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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