Degenerative lumbar spine disease

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Background

Degenerative lumbar spine disease (DLDSD) is a spinal disorder with or without neural component. Imaging evidence of DLDSD is most common in patients over the age of 70. The condition affects 1% of the population. Symptomatic patients may have significant problems with muscle weakness, numbness and pain in the spine, and a herniated central lumbar disc is a possible cause.

In terms of aetiology, most patients are chronically disabled, representing a re-enforcing feature of the disease. Other causes include a congenital malformation, infection, inflammation and rarer causes.

Diagnosis of degenerative lumbar spine disease

The primary symptom of DLDSD is axial pain, with a range of 12 to 36 percent in the Western world. It is commonly associated with a chronic disability, representing a re-enforcing feature of the disease. The pain is usually chronic and can be disabling. In many cases, the pain is exacerbated by activity and relieved by rest.

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 and progressive leg pain, numbness and healessness on walking with symptoms resolving at rest or on forward flexion. Intermittent claudication due to vascular insufficiency in the legs is an important differential diagnosis. Acute central lumbar canal stenosis, usually due to a large prolapsed disc, may present with cauda equina syndrome. The red flag signs are: saddle dysfunction with painless urinary incontinence and reduced anal tone, saddle numbness and bilateral sciatica. This is a neurosurgical 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 "radiculopathy", 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 area 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 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 DLDSD requires a multi-disciplinary team approach comprising of at least the neurosurgeon/orthopaedic surgeon, a neuro-radiologist, pain specialists and physiotherapists. It is important to provide the patients with the most effective treatment for their particular symptoms. Although patients with DLDSD represent the biggest group of patients seen in a general neurosurgical clinic, only a small proportion will ever need surgery.

In patients presenting with acute/subacute 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 return to 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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