

Assessment and management of patients with degenerative spine disease

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Abstract

Degenerative spine conditions can be asymptomatic but may present as back pain, leg pain, or both. Back pain is common, affecting over 80% of the population at some point. Many cases resolve with the passage of time, early rehabilitation and physiotherapy. Leg pain can either be referred, stenotic or radiculopathic in nature. Serious causes should be detected with the use of 'red flags' and surgery reserved for only the most severe cases that have not responded to conservative measures. The clinical features, investigations and management of the common degenerative spine pathologies are discussed here.

Keywords Back pain; prolapsed intervertebral disc; radiculopathy; red flags; spinal stenosis

Introduction

This article is an updated version of the one published by Evans and Breakwell in 2012.¹ We aim to revisit the basic principles of degenerative spine disease management and provide an update with regards to recent literature.

Serious pathology and red flags

It is essential that all healthcare professionals in contact with patients presenting with back pain are aware of warning signs that may suggest a serious underlying cause. Such pathology does not occur frequently in the primary care setting with the incidence of such having been estimated around 1% for cancer, 1–4% for osteoporotic fracture and less than 1% for spinal infections.² As part of its remit to set clinical standards in the treatment of back pain, in 1994 the Clinical Advisory Standards Group produced 'red flags' that highlight the need for further investigation and specialist centre referral (Box 1).

Mechanical (non-specific) back pain

Low back pain is extremely common, affecting over 80% of people at some stage and may affect up to a third of any

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Red flag signs

'Red flags' suggesting serious underlying pathology in patients with back pain

- Age at onset >50 years
- Violent trauma, e.g. fall from a height, road traffic accident
- Constant, progressive, non-mechanical pain
- Past history of cancer
- Drug abuse, human immunodeficiency virus, systemically unwell
- Systemic steroids
- Weight loss
- Persisting severe restriction of lumbar flexion
- Widespread neurology
 - difficulty with micturition
 - loss of anal sphincter tone or faecal incontinence
 - saddle anaesthesia
 - progressive motor weakness or gait disturbance
 - structural deformity

Box 1

population at any one time. In the majority of cases the cause of the pain is unknown. It continues to be the biggest cause of disability in young adults.³

Clinical presentation includes a variety of symptoms such as aching, stiffness, intermittent acute pain/spasms and radiation to buttocks/upper thighs (Box 2). The outcome of mechanical back pain improves with early appropriate management in the form of physical activity and physiotherapy. The prognosis of back pain is worse for those that have a chronic course or recurrent symptoms and can be related to psychological factors, with social and work environment influences.⁴ Smoking and ongoing

Features of mechanical low back pain¹

- Toothache of the back
- Aching pain
- Low back – buttock, thigh, sometimes calf or foot
- Stiff on rising – 30 minutes
- Morning is best time
- Worse over course of day
- Worse if active
- Gellation – stiff on sitting
- Shuffling, changing position
- Sleep well after settling
- Wake on turning over
- Giving way
- Trivial movement – bend/twist
- Acute pain and spasm
- Bed rest 2–3 days
- Gradual improvement

Box 2

compensation claims are known to be negative prognostic indicators.

As mentioned, mechanical back pain may radiate from the lumbar region into the buttocks, legs and (rarely) into the calves. This radiation can be unilateral or bilateral. Pain radiating beyond the knee is classically associated with nerve root pain and care should be taken to ensure that the cause of such pain is not simple mechanical radiation.

Clinical findings

Clinical examination is essential and follows the usual 'look, feel, move' pattern plus a peripheral neurological examination. Often there are few positive findings other than reduced range of movement. Classically, clinicians have been taught to look for features that may imply psychological distress/non-organic origin of pain. In practice these are rarely present.

Investigations

Imaging modalities contribute little to the diagnosis of mechanical back pain. As such, patients who do not present with 'red flags' should not have radiographs, computed tomography, flexion and extension views, discography, myelography or magnetic resonance imaging (MRI). MRI in particular will often show asymptomatic abnormalities such as disc dehydration or facet joint degeneration. This can result in patients being labelled with a disease,⁵ undermine their confidence in conservative measures and ultimately may contribute a chronic disease symptom pattern.

Treatment

In May 2009 NICE produced guidelines on the management of back pain.⁶ They indicate that the management of mechanical low-back pain should be based around conservative measures. A number of conservative treatments have, however, been advised against due to evidence of low efficacy. These include spinal traction, spinal injections, therapeutic ultrasound, lumbar supports, and electrothermal treatment. The guidelines recommend initial treatment with analgaesics, with physiotherapy treatment, manual therapy or acupuncture. Patient education is recommended. Referral to a specialized spinal centre should only be considered after 12 weeks with no improvement despite initial treatment and if the patient would consider spinal surgery for their symptoms.

Surgery for back pain

The surgical option for back pain has traditionally been fusion of a degenerate segment (Figure 1). There are many technical options to achieve this. Firstly there is the option to insert implants or to rely on decortication and bone graft. If implants are inserted these can be placed posteriorly or anteriorly. Bone graft for the fusion bed can be autologous or artificial. Alternatives to fusion have included disc replacement and 'soft-stabilization'.

There is no consensus as to the success of surgical treatment of mechanical low back despite a number of trials comparing the effectiveness of spinal fusion compared to non-operative treatment. A meta-analysis from Ibrahim et al. suggested that fusion appeared superior to natural history or unstructured physiotherapy, but only equivalent to intensive multi-



Figure 1 Anteroposterior (AP) and lateral lumbar spine plain radiographs showing posterolateral L4/5 fusion with pedicle screws. Note the spondylolisthesis on the lateral radiograph.

disciplinary therapy; however, the difference made by surgery was not statistically significant.⁷ A more recent meta-analysis suggested fusion for patients with demonstrable disc degeneration in the presence of chronic back pain was a 'viable option' when conservative measures have failed.⁸ Presurgical anxiety and depression have been found to be key negative prognostic factors in the successful outcome of spinal surgery in terms of patients reporting improved pain, employment status and functional outcome.⁹ The Swedish lumbar spine study group showed that complications from spinal fusion for low mechanical back pain range from 12% to 40% in one series, depending on the type of fusion offered, with a rate of fusion from 72% to 91% in another series but with no difference in patient reported improvement of pain.¹⁰

The SPORT trial (Spinal Patient Outcomes Research Trial) is a large multicentre randomized cohort study from the United States.¹¹ Although primarily designed to investigate outcomes with regards leg pain, it has looked at back pain as a secondary outcome. There have been criticisms of the trial with regards to statistical analysis and the large amount of cross-over of the study groups. In the specific context of degenerative spondylolisthesis, it suggests back pain improves more with surgery than with non-operative treatment.

There has been significant interest in the treatment of low back pain with antibiotics after a randomized double blind trial in Denmark showed patients with more than 6 months history of back pain with a known previous disc herniation and subsequent changes to the vertebral body on MRI responded well to 100 days of antibiotics.¹² These findings have yet to be replicated in another study and only pertain to a small specific subgroup of patients with lower back pain.

Prolapsed intervertebral disc

It has been estimated that leg pain caused by nerve root impingement (radiculopathy) has a lifetime risk of between 13%

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