39

Non-mechanical disorders of the lumbar spine: warning signs

CHAPTER CONTENTS

Introduction

The majority of lumbar spine syndromes encountered in clinical practice result from mechanical – activity-related – disorders. They can be classified into dural, ligamentous and stenotic syndromes. Lumbar syndromes, however, can also stem from non-mechanical – non-activity-related – disorders affecting the spine. These are: inflammatory diseases, both septic and rheumatological; tumours and infiltrative lesions; metabolic disorders; and acquired defects in the neural arch. Finally, pain in the lower back, groin and pelvic area can be referred from visceral organs (see online chapter *Disorders of the thoracic cage and abdomen*). Pain in buttocks, groin and limb, as the result of reference from the sacroiliac and hip joints, although 'activity-related', does not have a spinal origin and is discussed thoroughly in the chapters on the hip joint and sacroiliac joint.

Although the occurrence of non-mechanical (non-activity-related) disorders is rare, it is important to differentiate them as quickly as possible from mechanical activity-related lesions. This is never easy, because these disorders frequently mimic other, more specific lumbar lesions. Sometimes the diagnosis is made radiologically but very often this is of no help, especially in the early stages of an inflammatory or neoplastic disease. A thorough history and clinical examination are what will first draw attention to the possibility of a non-activity-related disorder: the history may show an unusual localization or an atypical evolution of the pain; particular clinical signs may arouse suspicion. Most of all, however, it is the comparison between history and clinical examination, resulting in the existence of 'unlikelihoods', that focuses attention on serious spinal pathology such as vertebral fracture, malignancy, infection or inflammatory disease.[1]

Warning signs in backache and sciatica

Symptoms and signs that almost invariably point to non-mechanical disorders are termed 'warning signs' here. The finding of such signs indicates that the existence of a non-specific disorder in the lumbar spine is very likely. A patient presenting with a warning sign should never be considered to be suffering from a common mechanical disorder until the contrary has been proved. It is important, therefore, always to have confirmatory investigations carried out (radiography, bone scan, computed tomography (CT) and blood tests) to settle the diagnosis. It is also the duty of a physiotherapist who is asked to give active treatment (manipulation or traction) to a patient presenting with warning signs to report this to the referring doctor, and to send the patient back with a request for further thorough examination.[2]

Warning

Warning signs that may be detected during the history are:

- Significant trauma
- Deteriorating general health
- Pain in the 'forbidden area'
- Increasing, slowly worsening pain
- Expanding, rather than shifting, pain
- Continuous pain, unaltered by position or movement
- Sciatica with too long an evolution
- Bilateral sciatica
- Increasing postoperative backache

Symptoms

Significant trauma

It is obvious that the statement of a significant trauma prior to the development of backache should be reason to ask for further imaging studies, especially if the patient is aged over 70 years and uses corticosteroids.[3,4]

Deteriorating general health

Unexplained weight loss, fever, feeling systematically unwell (tired, loss of appetite) and a previous history of cancer are all considered as potential symptoms of a serious illness.[5]

Pain in the 'forbidden area'

In the upper lumbar region pain is very seldom the result of a mechanical lesion. Disc lesions almost never occur at the first and second levels,[6] and even third lumbar lesions constitute only 5% of lumbar disorders.[7] Also, ligamentous lesions and recess stenosis do not seem to occur at these upper lumbar levels. Hence, if a patient has pain at the upper lumbar level – the 'forbidden area' (Fig. 39.1) – the suspicion is aroused that a non-mechanical lesion is present. Ankylosing spondylitis, neoplasm, tuberculosis, aortic thrombosis or reference from a viscus may then be possibilities (Cyriax[8]: p. 26).

Increasing pain

Lumbar pain steadily worsening over a number of weeks suggests malignant disease. This is especially true in elderly patients who have had central backache that has increased over a short period.

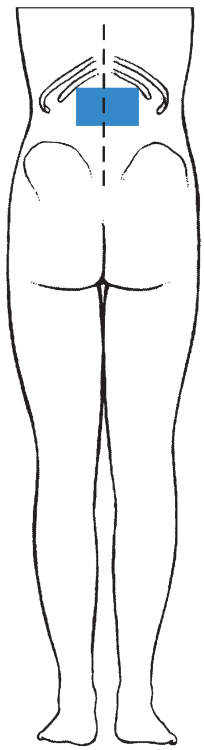

Fig 39.1 • The 'forbidden area'.

Expanding pain

A *moving pain* is a familiar symptom in disc lesions: the pain is central at first and becomes unilateral; or the backache changes sides; or there has been backache initially which has turned into leg ache after a time. Thus, in disc displacements, back pain may move to different localizations, or the backache eases when unilateral root pain comes on.

However, if the history is that of continuing backache, gradually *expanding* and worsening despite the appearance of root pain, a non-mechanical disorder should be suspected. In addition, a history of pain which first spreads to one dermatome but after some time also involves the neighbouring dermatomes should be considered to be the history of an increasing lesion, which almost never involves a disc. If pressure against the dura mater increases when pressure on the nerve root (or roots) sets in, the lesion responsible for the pain will not be a moving disc protrusion but a rapidly (neoplasm) or slowly (neuroma) increasing lesion.

Continuous pain

It is typical of mechanical disorders for postures and activities to have some influence on the pain: backache due to disc lesions is usually increased by sitting and bending and relieved by recumbency, while ligamentous pain has a typical postural nature and the radicular pain caused by a narrow lateral recess increases in the upright position and eases on sitting. When a patient's pain is more or less continuous and no posture can be found that relieves it, a serious spinal or extraspinal lesion should be suspected. Sometimes, however, a patient who is emotionally distraught or has hyperacute lumbago will claim that the pain is continuous. Further history taking will disclose that, although there is continuous disability, there may be some positions in which the pain eases somewhat, while severe twinges make other movements absolutely impossible. It is obvious that in these cases the pain is of mechanical origin.

Sciatica lasting too long

It is unusual for sciatica from a posterolateral disc protrusion to last longer than a year. The normal development is root pain which rapidly becomes worse and reaches a peak within 1–4 weeks. Severe symptoms then persist for a few weeks or months, thereafter improving. At the end of a year, nearly all patients have recovered. However, it is important to remember that patients over 60 years of age, especially those who still have some backache after root pain has appeared, do not always demonstrate a tendency to improve. Additionally, in cases of root compression caused by a narrowed lateral recess, the pain can remain present for months or years, without showing any tendency to worsen or improve.

If root pain continues to worsen after 9 months, the cause is almost certainly not a disc lesion, and a non-mechanical disorder, such as a neuroma or epidural cyst, is more likely. Rarely, sciatic pain that lasts longer than usual is caused by an adherent nerve root.

Bilateral sciatica

For the purposes of differential diagnosis, it is important not to confuse bilateral extrasegmental dural reference of pain with bilateral radicular pain. It is not difficult for an experienced examiner to distinguish between the two. Dural pain is dull, deep, diffuse and ill defined, and spreads to different dermatomes. Although dural pain often reaches the ankles, it never extends to the feet. Radicular pain is sharp and well localized, and stays within the borders of the dermatomes. The pain can reach the feet, except in the more exceptional cases of L1–L3 radicular pain, and can also be accompanied by distally localized paraesthesia and numbness.

If the patient presents with genuinely bilateral sciatica, a number of conditions must be taken into consideration:

- *Spondylolisthesis* can cause bilateral radicular pain, which presumably results from the forward movement of the listhetic vertebra, pulling the nerve roots painfully against the shelf formed by the stable vertebra below.
- *A disc lesion* resulting in bilateral sciatica is rare and should always be taken seriously because it probably means a massive protrusion, which poses a *risk to the S4 root*.[9] Bladder incontinence and numbness in the saddle area may then accompany the bilateral root pain. Rarely, a disc develops two protrusions, one at each side of the posterior longitudinal ligament; alternatively, two protrusions, one at the fourth level and one at the fifth, are present.
- *Bilateral lateral recess stenosis or a narrowed spinal canal* can also be the cause of bilateral sciatica. In the former, the typical history of increasing pain in the upright position is informative. In the latter, the patient mentions neurogenic claudication.
- *Malignant disease* is indicated by rapidly increasing bilateral sciatica, often spreading into the limbs in a distribution which corresponds to too many dermatomes.

Increasing backache after lumbar surgery

Intervertebral disc space infections most often follow surgical enucleation of a herniated disc.[10,11] After initial relief of the preoperative pain, severe and steadily increasing lumbar pain appears.

Signs

Warning

Clinical signs that constitute a warning are:

- Discrepancy between the marked articular signs and the absence of dural signs
- Gross limitation of both side flexions
- Gross limitation of side flexion away from the painful side as the only positive finding
- Flexion with a rigid lumbar segment
- Radicular pain and muscle spasm
- Discrepancy between pain and neurological deficit
- Involvement of multiple nerve roots
- Deficit of L1 and L2 nerve roots
- Buttock sign
- A warm foot on the affected side

Discrepancy between articular and dural signs

As acute lumbago is basically compression of the anterior part of the dural tube, dural signs should always be present. If a history of acute lumbago is described and marked articular signs are present but the patient has no dural signs at all, a disc lesion is unlikely and other more serious lesions should be considered, for instance:

- *In a pathological fracture* of a vertebra, resulting from a malignant disease or from senile osteoporosis, there is gross limitation of spinal movements but straight leg raising may remain normal and painless.
- *In ankylosing spondylitis*, an acute sprain of the stiffened lumbar joints will result in acute lumbago but dural signs are completely absent.
- *In chronic afebrile osteomyelitis* of a lumbar vertebral body, there is a gross contrast between the marked articular signs and the complete absence of dural signs.

Gross and bilateral limitation of side flexions

The range of side flexion diminishes with a patient's age. Some symmetrical limitation is therefore a normal finding in the elderly. However, bilateral limitation of these movements in younger or middle-aged patients is not normal and, if this sign is present, non-mechanical, and usually serious, diseases of the lumbar spine are strongly suggested. A lumbar localization of ankylosing spondylitis often presents with this sign, but so too can malignant or benign neoplasms, Paget's disease, chronic osteomyelitis and old fractures.

Gross limitation of side flexion away from the painful side

Gross limitation of side flexion away from the painful side (Fig. 39.2) is a common finding in acute disc lesions, in which it always appears in combination with other limited and painful

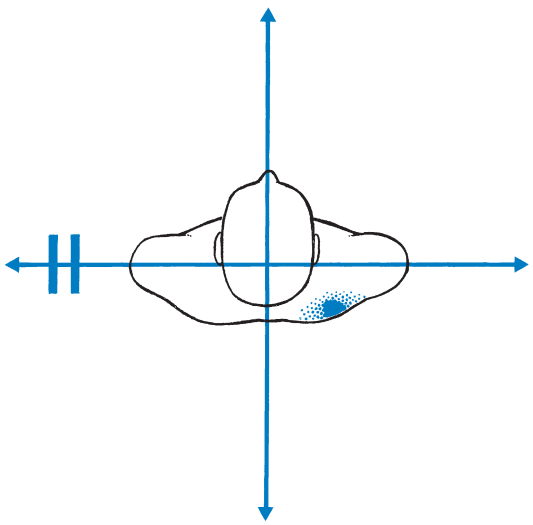

Fig 39.2 • Gross limitation of side flexion away from the painful side is a warning sign for serious disease.

movements, together forming the non-capsular pattern. However, when limitation of side flexion away from the painful side is the *only* positive lumbar feature, a disc lesion is never present and a serious extra-articular lesion must be suspected. This pattern suggests an abdominal neoplasm, usually carcinoma of colon or kidney, although a neuroma at the lumbar or lower thoracic level should also be considered.

Flexion with a rigid lumbar segment

Patients with serious disease of the lumbar spine flex from their hips; the lumbar spine is held in lordosis by spasm of the sacrospinalis muscle. The patient bends like an old-fashioned butler. This characteristic type of flexion – the lumbar spine held rigid and the body flexing as a whole at the hips – sometimes accompanies bilateral limitations of side flexion and must always be taken seriously. It is sometimes seen in acute lumbago caused by an ordinary disc lesion, but most often it indicates a spinal localization of ankylosing spondylitis or a more serious non-mechanical disorder of the spine. Care should be taken not to confuse this sign with a normal flexion range in a patient with marked kypholordosis. In such a case, the spine may stay horizontal at the end of the flexion, although the lumbar segment has undergone a considerable flexion movement.

Radicular pain and muscle spasm

In sciatica from a disc lesion, trunk flexion is limited because of pain felt in the limb, the patient being unable to stretch the sciatic nerve beyond a certain point. Usually, this limitation is associated with a degree of spasm of the sacrospinalis muscle. However, when side flexion or extension provokes radicular pain and also induces muscle spasm, more serious spinal diseases must be suspected, rather than a disc lesion.

Discrepancy between pain and neurological deficit

In disc lesions, some muscle weakness will be present only after a history of severe radicular pain. This does not mean that the patient must still have sciatic pain at the moment that paresis is detected. For instance, in root atrophy, radicular pain disappears the moment weakness becomes obvious. Although there is not a great deal of pain at this stage, the history is that of recent and severe sciatica.

If, by contrast, a patient presents with severe weakness without a record of severe pain in the limb, spinal metastases are likely. In disc lesions, it is very unusual to find complete paresis of a muscle except when two consecutive roots are involved, as sometimes happens in combined L4–L5 lesions at the fourth lumbar level and which leads to a drop foot.

Involvement of multiple nerve roots

Although one lumbar disc protrusion often compresses two adjacent nerve roots, triple palsies or bilateral palsies almost always result from metastases or from neuralgic amyotrophy.

Deficit of L1 and L2 roots

Disc lesions at the first and second lumbar levels are extremely rare; the estimated frequency is between 0.3 and 0.5%.[12–14] Also, lateral recess stenosis leading to muscular weakness does not occur at the upper lumbar levels. Therefore, if weakness of the psoas muscle is encountered, the initial diagnosis should never be a disc lesion but rather a serious non-mechanical disorder. In a neoplasm at the second lumbar level, a bilateral paresis is likely to appear. If unilateral weakness is accompanied by pain in the iliac fossa, brought on when the muscle contracts, a neoplasm at the iliac crest or in the pelvis is possible. If the weakness is accompanied by pain in the thigh, metastatic invasion of the upper femur is probable (see Ch. 48).

Presence of the 'sign of the buttock'

When the sign of the buttock is encountered, a serious lesion in the lumbopelvic area is always present (see Ch. 47). This can be a malignant deposit in the sacrum, iliac bone or femur, septic arthritis of the sacroiliac joint or a rectal abscess.

A warm foot on the affected side

In radicular pain caused by disc lesions, patients often complain that the foot and the leg on the affected side feel cold, which is often confirmed by palpation. If, by contrast, the affected side is warmer, neoplasm at the upper lumbar level should be suspected (Cyriax[8]: p. 292). The explanation is probably interference by the tumour with the sympathetic nerves at L1 and L2.

Access the pathology of the non-mechanical disorders of the lumbar spine and the complete reference list online at **www.orthopaedicmedicineonline.com**

References

1. Deyo RA, Rainville J, Kent DL. What can the history and physical examination tell us about low back pain? *JAMA* 1992;**268**:760–5.
2. Ferguson F, Holdsworth L, Rafferty D. Low back pain and physiotherapy use of red flags: the evidence from Scotland. *Physiotherapy* 2010;**96(4)**:282–8.
3. Henschke N, Maher CG, Refshauge KM, et al. Prevalence of and screening for serious spinal pathology in patients presenting to primary care settings with acute low back pain. *Arthritis Rheum* 2009;**60(10)**:3072–80.
4. Old JL, Calvert M. Vertebral compression fractures in the elderly. *Am Fam Physician* 2004;**69(1)**:111–6.
5. Portenoy RK, Lipton RB, Foley KM. Back pain in the cancer patient: an algorithm for evaluation and management. *Neurology* 1987;**37**:134–8.
6. De Palma A, Rothman RH. *The Intervertebral Disc*. Philadelphia: Saunders; 1970.
7. Albert TJ, Balderston RA, Heller JG, et al. Upper lumbar disc herniations. *J Spinal Disord* 1993;**6**:351–9.
8. Cyriax JH. *Textbook of Orthopaedic Medicine, vol I, Diagnosis of Soft Tissue Lesions*. 8th ed. London: Baillière Tindall; 1982. p. 263.
9. Shi J, Jia L, Yuan W, et al. Clinical classification of cauda equina syndrome for proper treatment. *Acta Orthop* 2010;**81(3)**:391–5.
10. Silber JS, Anderson DG, Vaccaro AR, et al. Management of postprocedural discitis. *Spine J* 2002;**2(4)**:279–87.
11. Sobottke R, Röllinghoff M, Zarghooni K, et al. Spondylodiscitis in the elderly patient: clinical mid-term results and quality of life. *Arch Orthop Trauma Surg* 2010;**130(9)**:1083–91.
12. Gurdjian ES, Thomas LM. *Neckache and Backache*. Springfield: Thomas; 1970.
13. Armstrong J. *Lumbar Disc Lesions*. Baltimore: Williams & Wilkins; 1965.
14. Krämer J. Intervertebral Disk Diseases. Stuttgart: Thieme; 1981. p. 148.