

Lumbar spine X-rays for back pain — still justified as a screening examination in South Africa

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Abstract

Standard teaching in the imaging approach to patients with back pain is that plain X-ray should only be obtained after 3 months of conservative treatment and thorough clinical examination and appropriate laboratory investigations. This approach, while appropriate in first-world countries, may lead to conditions such as tuberculosis of the spine being overlooked. An analysis was therefore made of 1 383 patients with complaints of lower back pain who were referred for X-ray of the lumbar spine. In 28 patients active spinal tuberculosis was diagnosed; in 8 of these patients the diagnosis had not been suspected clinically. It is concluded that in South Africa with its unsophisticated patient population and poor facilities, limited X-ray (lateral and AP view) of the lumbar spine is justified in patients presenting with back pain for the first time.

Introduction

It is now accepted and well-documented in both the European and American literature that radiological investigation in patients presenting with backache should be reserved for those patients who fail to respond after a 2 - 3-month period of conservative treatment. In a frequently cited investigation, Nachemson¹ reported that in the absence of clinically suspicious features, routine radiographs in patients with backache have a 1 in 2 500 chance of detecting serious disease.

It is questionable, however, whether this well-reasoned approach can be adopted as the level of sophistication of the patient population differs markedly between first-world and third-world countries. Certainly in South Africa, where diseases such as spinal tuberculosis are not only common, but are increasing in frequency, there is perhaps justification for utilising routine radiographs of the lumbar spine as a primary investigation in patients presenting with backache.

Methods

A retrospective review was undertaken of patients presenting either to the general outpatient or orthopaedic outpatient departments at Tygerberg

Hospital during a 9-month period. Patients with complaints of low back pain ($N = 1\ 383$) were referred for radiography of the lumbar spine. Antero-posterior (AP) and lateral views of the lumbar spine were obtained and reviewed by a single radiologist.

In cases where spinal tuberculosis was detected, the clinical records were analysed in order to ascertain whether a diagnosis of spinal tuberculosis was suspected prior to the patient being X-rayed.

Results

Table I shows the radiological findings in the group of patients examined. In 805 patients no abnormality was detected. In 515 there was evidence of either degenerative disk disease or facet joint disease. Fourteen patients had changes of Paget's disease, while 6 patients showed changes of neoplastic disease and 20 patients had evidence of spondylolisthesis. In the group of 28 patients with active spinal tuberculosis, review of their clinical records revealed that in 8 patients the diagnosis had not been suspected clinically (Fig. 1a, b).

Table I. Observation on X-ray examination of the lumbar spine in 1 383 consecutive patients presenting with backache (N)

Normal	805
Facet joint arthrosis	} 515
Spondylosis	
Paget's disease	14
Neoplastic disease	6
Spondylolisthesis	20
Tuberculosis	28
Total	1 383



Fig. 1a, b. AP and lateral views of the lumbar spine showing destruction of the vertebral body of L3 with narrowing of the L3-4 disk space due to spinal tuberculosis.

Discussion

Lumbar spine radiography is an examination associated with a high radiation dose. For an individual patient, the standard three film examination involves an average absorbed radiation dose of 2.2 mSV; this is about 40 times the dose received during chest radiography.² Halpin *et al.*³ suggested that as every radiation

exposure carries a 1/80 000 risk per mSV of inducing a fatal cancer, this would mean statistically that of the 700 000 people who underwent lumbar spine radiography in the UK in 1973, 19 people would die each year as a consequence of these X-rays.

Nachemson¹ and Waddell,⁴ in separate reports, suggest that careful clinical evaluation together with appropriate blood tests, including erythrocyte sedimentation rate (ESR), are more appropriate initial investigations than X-ray. These authors reserve radiographic investigation for those patients whose symptoms have not settled after 3 months of conservative treatment.

The above approach makes several assumptions which are not necessarily correct with regard to third-world patient populations. Language problems are a major barrier to obtaining an accurate clinical history. Further, in South Africa many patients do not return for their follow-up appointments.

Patients from poor socio-economic circumstances who have abnormal laboratory tests and fail to return for follow-up are extremely difficult to contact. As such it is difficult to request them to present for treatment.

In light of all the above it is very difficult to ensure that patients with back pain who are not improving on treatment, or who have abnormal laboratory investigations, will return to hospital before their disease has advanced significantly.

The primary purpose of plain film radiography of the lumbar spine is to exclude the presence of serious disease. These are conditions which produce symptomatology very similar to that experienced due to mechanical or discogenic back pain. In his compre-

hensive review of the value of radiology for back pain, Butt⁵ mentions conditions such as spondylosis, ankylosing spondylitis, and in the older patient, metastasis to the base of the pedicle. Significantly, he does not mention infective conditions of the vertebral bodies and disc spaces.

Our radiographic protocol for screening patients with back pain utilises only two radiographs, the lateral and AP views. Special attention is paid to ensuring that the thoracolumbar junction is demonstrated on the radiographs. We find that the AP view is of considerable value in the diagnosis of spinal tuberculosis. Paravertebral abscesses, early disk space narrowing and posterior spinal involvement are shown to advantage.

Spinal tuberculosis is endemic in South Africa and tuberculosis is particularly prevalent in the Western Cape. Amongst the coloured population, there has been an untoward, sustained rise in the incidence of tuberculosis. This upward trend commenced in 1971, and the predicated pulmonary tuberculosis incidence rate for the coloured group for the year 2001 was 672/100 000 of the population.⁶

Many patients with spinal tuberculosis present with grumbling back pain. The degree of pain experienced is unreliable in predicting abnormal radiological findings as reported by Halpin *et al.*,³ and in a separate investigation by Kelen *et al.*⁷

Conclusion

In this series, utilisation of lumbar spine radiography as an initial investigation in patients presenting with backache, was responsible for the detection of spinal tuberculosis in 8 patients. Crosier⁸ has reported a time

lag of at least 4 months between the onset of backache and the first proper clinical examination in a series of patients with spinal tuberculosis in South Africa.

The extra cost involved in routine radiography of the lumbar spine as an initial investigation as well as the irradiation dose to the patient, must be weighed against the dangers of overlooking early spinal tuberculosis. Progression of untreated spinal tuberculosis to spinal cord compression and paraplegia is a catastrophe for the

patient, often resulting in life-long disability. In our view, the use of a limited two-film radiographic examination of the lumbar spine as an initial investigation in patients presenting with backache is justified and should be performed in those countries where tuberculosis is endemic.

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