A 68-year-old woman with signs of spinal tuberculosis

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A 68-year-old woman, recently arrived from Sri Lanka to live with her family in Australia, presented with severe back pain of sudden onset. Spinal x-rays were consistent with Pott's disease. How should she be managed?

PHOTOGRAPH COURTESY OF PROFESSOR LYN GILBERT

Figure 1. X-ray of a case of spinal tuberculosis, showing lumbar vertebral collapse (L4) and soft tissue swelling.

Orthopaedic surgeon's commentary

History and examination

The first step in the management of this woman is a thorough history and examination. Although the radiographs are consistent with spinal tuberculosis (Pott's disease; see Figure 1), differential diagnoses would include metastatic malignancy, primary bone tumours, pyogenic or fungal infection and sarcoidosis. Questions should be directed regarding these possibilities.

Typical early symptoms of tuberculous infection of bone are weight loss, malaise, night sweats and fevers, which could also occur in these other conditions. The patient should be asked about previous known TB infection, as her current problem is likely to be a reactivation of the disease (Figure 2).

Neurological compromise is common in adult spinal TB and symptoms may wax and wane. Therefore, it is critical to enquire about complaints of recent or current lower limb sensory or motor dysfunction and especially bowel or bladder dysfunction.

Physical examination should take note of the presence of cachexia, lymph - adenopathy, clubbing and any healed or active sinuses. Auscultation of the chest and examination of the breasts and abdomen for masses are necessary. The spine may have an obvious kyphosis or kyphoscoliosis and there is usually overlying point tenderness, paravertebral muscle spasm and limited range of movement at the affected level.

Careful neurological assessment is the most important part of the examination. Decreased anal tone may be the only clue to a cauda equina syndrome, so per rectal examination is essential. The presence of a neurological deficit indicates urgent referral to a spinal surgeon.

Investigations

Appropriate investigations would be:

- full blood count
- electrolyte, urea and creatinine levels
- liver function tests
- calcium and phosphate levels
- erythrocyte sedimentation rate
- C-reactive protein
- HIV serology.

Mantoux testing is usually not indicated because up to 20% of tests will

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be negative in TB infection – and in cases with a markedly positive response, skin ulceration can occur.

Chest x-ray is needed (see Figure 2), but will be normal in two-thirds of cases. The entire spine should be x-rayed because skip lesions occur. MRI with gadolinium contrast will allow the best evaluation of the soft tissue mass and any spinal canal involvement. CT scanning is better for assessing the extent of bony destruction; consequently both tests are warranted. Nuclear scans are rarely indicated.

The above tests will assist in making a diagnosis of spinal TB; however, none are confirmatory. Biopsy of the lesion, usually by CT-guided fine-needle aspiration, is necessary to make a definitive diagnosis.

Management

Treatment in all cases includes long term antibiotics, usually isoniazid, rifampicin (Rifadin, Rimycin), pyrazinamide (Zinamide) and ethambutol (Myambutol) in various combinations. Advice from an infectious diseases specialist is recommended to individualise therapy.

The standard surgical treatment of TB affecting two lumbar vertebrae is radical anterior debridement and strut grafting with either autogenous iliac crest or fibula, followed by at least three months of immobilisation in a cast until bony union has occurred. This is in conjunction with long term antibiotics, commencing at least 10 days prior to surgery.

An absolute indication for surgery is neurological compromise. Other situations in which surgery is strongly indicated are when there is:

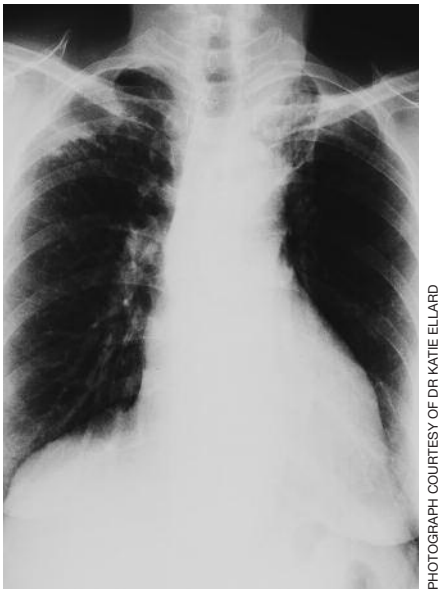
- recurrence of infection or resistant organisms present
- significant kyphosis
- more than one vertebral body involved.

Advantages of surgery are that kyphotic deformity is minimised, the risk of paralysis is reduced, and there is earlier resolution of infection with the likelihood of its recurrence also reduced.

In cases without neurological deficit or severe kyphosis, antibiotics and bracing are a viable option, especially in places not experienced in major anterior spinal surgery or in patients too frail to undergo the procedure.

In summary, as TB in all its clinical manifestations is becoming more common, Pott's disease may not remain a rarity in Australia. In the early assessment of these patients, it is critical to examine for the presence of neurological compromise.

Thorough investigation, including biopsy, is needed to make the diagnosis confidently. Management requires liaison with infectious diseases consultants and specialist spinal surgeons.



PHOTOGRAPH COURTESY OF DR KATIE ELLARD

Figure 2. Chest x-ray of a 68-year-old woman showing scarring in the upper lobes, consistent with her history of previous TB.

Infectious diseases specialist's commentary

Investigations

The diagnosis is likely to be spinal tuberculosis (also known as tuberculous spondylitis). The differential diagnosis is covered in the commentary above.

The key questions to answer are:

- Is there any evidence of local complications, especially neurological (cord) damage or any spinal cord instability – also paravertebral abscess, extension into psoas etc?
- Is there any evidence of active TB elsewhere, such as pulmonary infection, tuberculous meningitis or urogenital infection?
- If there is active pulmonary infection, is the patient infectious (cavitating disease, sputum smear positive for acid-fast bacilli)?
- How can the diagnosis be best confirmed and a culture diagnosis established so that any antituberculous drug resistance is recognised?
- Is TB in this patient due to reactivation or recent infection? If due to reactivation, how can family screening (and if infectious, close contact screening) be assured? If recent infection is suspected, is there a primary source present who could be involved in spread to other unrelated subjects?
- How will treatment be implemented and supervised?
- What is the psychological effect of a diagnosis of TB on this patient and her family?

TB spondylitis may present as part of the primary infection in younger people – this is the form most often seen in developing countries. Whereas, in Australia, onset in the fifth or sixth decade is more frequent and usually represents reactivation at a focal site after a long period of latency.

Reactivation is less likely to be associated with infectiousness unless there is:

- cough
- an active lesion on chest x-ray (many have evidence of past scarring), or
- clinical evidence of laryngeal disease.

Genitourinary disease may be asso-

ciated with vertebral disease; hence this is worth excluding even though it may not alter management. Spondylitis may be associated with a paravertebral abscess, and a CT or an MRI scan would be recommended in all patients.

The presence of an abscess allows infection to spread longitudinally up or down the spine, or into adjacent soft tissues. Involvement of intervertebral disk space and subsequently neighbouring vertebrae is characteristic.

Spinal biopsy will produce a smear positive for acid-fast bacilli in only about 50% of cases. Histopathology may improve the yield – granulomata are present in about 75% of cases. Newer molecular diagnostic tests (such as the polymerase chain reaction; PCR) may improve the yield further.

Unless another site of infection is overtly present (sputum, urine) the spinal biopsy is also indicated to establish a culture diagnosis. With newer techniques, most isolates will grow within two to three weeks.

As isoniazid and rifampicin (the only mycobactericidal drugs) remain the cornerstones of therapy, it is important to exclude any acquired drug resistance. This may still be less of an issue in elderly patients with reactivation of past TB because they were presumably not exposed to drug-resistant strains. However, multidrug resistance is an increasing concern in recent, overseas-acquired TB.

Management

Therapy is usually initiated with four drugs for two months (rifampicin, isoniazid, ethambutol and pyrazinamide), as per pulmonary disease, but the length of therapy in spondylitis is often individualised and rifampicin and isoniazid therapy is usually extended beyond six months.

Once the diagnosis is made, the outcomes of conservative therapy are very heartening. In recent studies from Africa, in patients without neurological involvement, chemotherapy alone resulted in a favourable response in 90%.

The early use of steroids may be effective when paraplegia is due to arachnoiditis, but laminectomy should be undertaken when there is anatomical cord compression.

Orthopaedic surgery may be required when there is anatomical instability; in other settings, the need for surgery rarely affects long term outcome.

Effective management is contingent on ensuring 'directly observed therapy'. It is a principle of tuberculosis therapy that all patients have close supervision because clinical failures and development of drug resistance are invariably due to lack of compliance (and professionals are the worst!).

Close contact screening is also required. In this patient, unless a pulmonary lesion is present, it would be limited to family screening using Mantoux testing and chest x-rays.

A recent laboratory development has been the ability to epidemiologically link outbreak strains using DNA fingerprinting. This technique is recommended when there is a suggestion of recent transmission. It can be chastening to realise that inadvertent spread among unrelated patients can be due to a common source.

Tuberculosis can be a cause of stigma in families of different cultural backgrounds. It is important that families are handled with sensitivity. They need to be reassured about confidentiality (sometimes tricky when contact screening is desirable) and the very good potential for cure if compliance with treatment is assured. MT