Recent Onset Neck Pain with Associated Neurological Deficit – Potts Disease Remains an Important Differential Diagnosis

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Abstract
The incidence of spinal tuberculosis is increasing in developed nations. In Ireland, half of all cases seen in the most recent decade for which figures are available were diagnosed in 2005-2007, the three most recent years for which there is complete data. We discuss a patient who presented with neurological complications due to destructive spinal tuberculous disease affecting the sixth cervical vertebra.

Case Report
A thirty-three year old Nepalese-born male, resident in Ireland for two years, presented with a six-week history of neck stiffness, associated with burning pain in both upper limbs. He was systemically well with no significant medical history or history of trauma. Examination revealed weak extension at the elbow and wrist, reduced sensation over the C5/C6 dermatomes and an exaggerated biceps reflex bilaterally. Cervical spine palpation was non-tender. Haematological profile and inflammatory markers, including C - reactive protein and erythrocyte sedimentation rate, were within normal limits. Plain films of the cervical spine showed a compression fracture of the sixth cervical vertebra, with computed tomography (CT) and magnetic resonance imaging (MRI) suggestive of an infectious cause (Figure 1). Although a Mantoux test was strongly positive, 18 millimetres of induration was present 48 hours following injection, all further investigations including HIV test, tumour markers, immunoglobulin profile, urinary electrophoresis and blood cultures were negative. A plain radiograph of the chest was reported as normal.

Figure 1: Magnetic Resonance Imaging (MRI) of the cervical spine (saggital plane) performed on admission. A compression fracture of the C6 vertebral body, with a resultant paraspinal mass extending into the spinal canal, is clearly visible [arrow]. Computed tomography performed on admission demonstrated an associated severe kyphotic deformity.

In the acute setting, the patient was managed on a rotation bed with cervical spine traction. Empirical treatment with rifampin, isoniazid, ethambutol and pyrazinamide was commenced. Semi-elective anterior cervical decompression and stabilisation was performed (Figure 2). Resected bone and tissue samples stained positive for acid-fast bacilli (AFB). Mycobacterium tuberculosis sensitive to the commenced anti-tuberculous regimen was subsequently cultured, confirming the diagnosis of spinal TB. Complete neurological recovery occurred within ten days of the procedure.

Figure 2: Post-operative plain film of the cervical spine (lateral view) showing a vertebral body cage and anterior plating fixation system. Note the correction of the kyphotic deformity.
Discussion

In 2007 in Ireland, the most recent period for which figures are available, the national notification rate for tuberculosis was 11.3 cases per 100,000, the highest annual total of the past decade. This compares with the Nepalese incidence of 176 cases per 100,000 in 2006. The emergence of drug-resistant strains of M. tuberculosis, the increase in immigration and the rising number of immunocompromised patients is believed to underlie the increasing incidence of both TB and Pott's disease in developed nations. In Ireland, 22 of the 45 cases of Pott's disease diagnosed between 1998 and 2007, the most recent decade for which figures are available, were diagnosed in the last three years of that time period. The spine, involved in 3% of TB cases in the developed world, is the most commonly affected skeletal site. Neurological sequelae, seen in 30% of cases, are the most serious complication of spinal involvement. As a result of insidious disease progression and the frequent lack of constitutional symptoms, the diagnosis of spinal TB is often delayed, increasing the likelihood of neurological involvement.

Plain radiography provides much of the information necessary for diagnosis of Pott's disease however, in a significant number of cases, it can underestimate disease severity. CT and MRI are therefore vital, particularly when evaluating patients with neurological deficit or patients that may require surgery. Culture of M. tuberculosis, the traditional diagnostic gold standard, is of limited use in Pott's disease, as a result of the organisms slow growth rate and fastidious growth requirements. The Mantoux test is of limited use due to poor sensitivity and specificity. Histological examination including AFB staining is therefore of great importance in establishing the diagnosis. In cases where diagnosis is not confirmed from radiological findings alone and where surgery is not warranted, image-guided needle core biopsy may be required to obtain tissue for alternate diagnostic methods, such as polymerase chain reaction (PCR).

The primary aim of Pott's disease treatment is eradication of the infection. Drug therapy alone is curative in the majority of cases. Owing to differing bacterial strains and disease severity a standard anti-tuberculous treatment regimen does not exist and specialist opinion should be sought. Surgical intervention, which was previously used to control local disease, is now used primarily for the prevention and correction of kyphotic deformity or, following the emergent institution of non-operative spinal stabilization measures, in Pott's disease with neurological complications. In conclusion, Pott's disease is encountered with increasing frequency in the developed world. Fortunately, complete healing with anti-tuberculous chemotherapy is possible and, in cases where spinal decompression is required, full neurological recovery rates have been reported in as many as 94% of cases. As early diagnosis is the most significant prognostic factor, a high degree of suspicion is warranted and Pott's disease should be considered early in the differential diagnosis of recent onset neck or back pain with associated neurological deficit, particularly if the patient has recently emigrated from a country with a high incidence of infection with M. tuberculosis.

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