Expert's comment concerning Grand Rounds case entitled “A large tuberculosis abscess causing spinal cord compression of the cervico-thoracic region in a young child” (by S. R. Manoharan, J. Leita, P. Emberton and N. A. Quraishi, doi:10.1007/s00586-013-2729-1)

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The authors present an interesting case of an 11-year-old female child with cervical spine epidural abscess of tuberculous origin with paraparesis of 3 months duration [1]. She was treated conservatively with oral antituberculous drugs, which led to complete resolution of the neurological symptoms and good radiological healing. The authors make a point that even in the presence of incomplete neurological deficit, conservative therapy can be successful. This case brings many interesting features to focus that require more discussion than what the authors have done.

The treatment of spinal tuberculosis has undergone radical shifts in opinion over the decades. The advent of powerful and effective antituberculous drugs not only allowed complete cure of the disease in many patients, but also made surgery very successful when needed. It is well

accepted that uncomplicated spinal tuberculosis (those without neurological deficit, or potential for deformity) is now mainly a ‘*medical disease*’. Surgeons treating a large number of patients in endemic areas are well aware of the spectacular successes with chemotherapy alone and complete resolution of the disease even in severe cases. The successful outcome in this patient may not be surprising to the vast majority of surgeons routinely treating spinal tuberculosis. However, this case has potential to be educational to the surgeons not routinely treating spinal tuberculosis that a routine emergent decompression and stabilization may not be justified.

The disease pattern of this child has two important features, which made conservative treatment successful. Although the authors have failed to highlight these, it should be discussed in detail. Firstly, the canal encroachment was purely by cold abscess without any pressure by a bony sequestration or disc material that was pressing on the cord. More than 60 % of spinal tuberculosis is associated with abscess formation which may be extra- or intra-spinal to varying extent. In the extra-spinal location, even large abscesses may be completely asymptomatic (Fig. 1). When present intraspinally, they can result in cord compression. Unlike pyogenic epidural abscess, which often present as acute neurological deficit even when the size is small, cold abscess of tuberculous origin are often seen in MRI causing an alarming compression of the spinal cord but without a neurological deficit. Up to 76 % of canal encroachment even in the thoracic region has been reported as compatible with intact neurology [2]. The reason is that these abscesses evolve very slowly over a period of time causing gradual and chronic compression. They also lack the inflammatory response of the pyogenic abscess. A cold abscess can, however, be a cause of neurological deficit when it is comprises thick granulation tissue and caseous material

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Fig. 1 A young male with a minimal sacral lesion with unusually large bilateral psoas abscess and also abscess in both gluteal region. This patient was completely asymptomatic regarding the abscess

Fig. 2 Diagram of the radiological signs for the ‘spine at risk’. **a** Separation of the facet joint. The facet joint dislocates at the level of the apex of the curve, causing instability and loss of alignment. In severe cases the separation can occur at two levels. **b** Posterior retropulsion. This is identified by drawing two lines along the posterior surface of the first upper and lower normal vertebrae. The diseased segments are found to be posterior to the intersection of the lines. **c** Lateral translation. This is confirmed when a vertical line

drawn through the middle of the pedicle of the first lower normal vertebra does not touch the pedicle of the first upper normal vertebra. **d** Toppling sign. In the initial stages of collapse, a line drawn along the anterior surface of the first lower normal vertebra intersects the inferior surface of the first upper normal vertebra. ‘Tilt’ or ‘toppling’ occurs when the line intersects higher than the middle of the anterior surface of the first normal upper vertebra

that also contain large fragments of extruded disc or large bony sequestra. These can often be visualized and reported by a good radiologist in the CT and MRI scans, the presence of which will tilt once decision in favour of surgery.

Another factor, which allowed conservative therapy in this patient is the absence of instability which is an important cause for development and progress of neurological deficit. It is our observation that large canal encroachments in a stable spine are frequently well accommodated in spinal tuberculosis. On the contrary, an unstable spine, which allows transitory movements and displacement, is often associated with neurological deficits. This patient had a stable spine both clinically and radiologically. The requirement of a stable spine for conservative therapy should be emphasized. The presence of spinal

instability can be appreciated even on plain radiographs by Rajasekaran’s ‘Spine at Risk’ radiological signs [3] (Fig. 2). These signs indicate facet joint subluxation and instability even on plain radiographs and are a valuable adjunct in clinical practice since CT and MRI may not be easily available in many places where spinal tuberculosis is rampant. Presence of ‘Spine at risk’ sign is a relative contra-indication for conservative therapy.

It is worthwhile to remember that unlike pyogenic infection, emergent decompression in the presence of minor loss of motor power is not applicable in spinal tuberculosis provided spinal stability is largely preserved. In the western world and in centres not hugely experienced in the management of this age-old disease, there may be a tendency for spinal cord compression for even minimal

Fig. 3 A young girl child with a large retropharyngeal abscess, which was completely cured by chemotherapy alone. Follow-up MRI shows complete resolution of the abscess and good healing of the bone lesion

neurological deficit. Tuli observed a 40–50 % neural recovery with non-operative treatment while the patient was being prepared and waiting for surgery. According to him, the case for universal surgical intervention in all patients of Pott's paraplegia seemed overstated. He advised a 'middle path regime' where a judicious approach of routine non-operative treatment and operative decompression only when needed should be performed [4]. Early surgical decompression is indicated in conditions where the patient presents with a rapid development of neurological deficit, the neurology does not improve or gets worse while on chemotherapy, a pan-vertebral disease producing pathological subluxation or dislocation and active disease demonstrating 'Spine at risk' radiological signs. All other patients may benefit from an initial trial of conservative therapy following which surgery can be decided only if there is a non-response. The above patient, as can be seen, can be treated eminently by chemotherapy.

Surgical intervention purely for the purpose of clearance of abscess is also not necessary in cold abscess. In the MRC trials in Madras, there was a faster resolution and a lower incidence of persistent abscess at 10-year follow-up in patients undergoing radical surgery in comparison to

those treated by short course chemotherapy. However, in none of the cases, there was any recurrence of a lesion during the 10-year period. This is our experience too. Complete resolution of the psoas and paraspinal abscess following chemotherapy is the usual outcome (Fig. 3). The presence of a small remnant of the abscess is no cause for alarm, as it neither indicates active disease nor a higher chance for recurrence.

Conflict of interest None.

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