Lumbosacral Spinal Tuberculosis: A Clinical Prospective Study

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Abstract
Tuberculosis of the spine is one of the most common spine pathology in India. Over last 4 decades a lot has changed in the diagnosis, medical treatment and surgical procedures to treat this disorder. Further developments in diagnosis using molecular genetic techniques, more effective antibiotics and more aggressive surgical protocols have become essential with emergence of multidrug resistant TB. Surgical procedures such as single stage anterior and posterior stabilization, extrapleural dorsal spine stabilization and endoscopic thoracoscopic surgeries have reduced the mortality and morbidity of the surgical procedures. is rapidly progressing. It is a challenge to treat MDR-TB Spine with late onset paraplegia and progressive deformity. Physicians must treat tuberculosis of spine on the basis of Culture and sensitivity.

Keywords: Tuberculous spondylitis, Spinal Tuberculosis.

Introduction
Recently, due to HIV infection, bacterial resistance, and population migration, tuberculosis has become a leading cause of death in adults, especially in developing countries, with 1.4 million people dying of tuberculosis in 2011 [1]. Historically, the treatment for spinal tuberculosis has always been conservative and has included methods such as immobilization using body casts or plaster beds and a diet of nutritious food [2]. After anti-TB drugs became available for clinical use, many studies indicated that the administration of anti-TB drugs alone could effectively heal tuberculosis [3–6], but it may not be suitable in all situations, especially when treating patients with a risk of instability, progression of neurologic deficit, and failure of medical treatment. Many scholars have proposed that such patients should receive surgical treatment in order to prevent and correct spinal deformity, to improve neurological function, and to reconstruct spinal stability [7–9].

Materials and Methods

Ethics Statement
The study was approved by the Institutional Ethics Review Board at the First Affiliated Hospital of Guangxi Medical University; written informed consent was obtained from all patients or guardians.

Patients’ general information
This study evaluated 53 patients with lumbosacral tuberculosis who were treated in our institution from January 2005 to January 2011 (Table 1). There were 29 males and 24 females with average ages of 37.53 ± 17.28 years (range 6–72 years), including 5 juveniles with average ages of 11.00 ± 5.10 years (range 6–17 years). All patients had symptoms of tuberculosis such as weight loss, moderate fever, and fatigue. Plain X-ray and MRI or CT were performed in all cases with the following results: vertebral bone destruction, uneven signals of bone, and smaller intervertebral space; 22 patients also showed a paravertebral abscess. 7 of the patients (13.2%) had hypertension, 4 (7.5%) had diabetes, and 9 (17.0%) had hepatitis B; each of these groups was subjected to periodic examination and related treatment. None of the patients were HIV positive. All patients received laboratory tests including complete blood count, ESR, and CRP. The diagnosis of tuberculosis was made with reference to symptoms, physical signs, and clinical and radiological findings, and was verified histopathologically after debridement in surgical patients.

The neurological function assessed by the Frankel scoring system showed that 19 patients were grade B, 21 patients were grade C, and 9 patients were grade D.

This table shows Summary of clinical data obtained in the 53 patients with lumbosacral spinal tuberculosis. ST: surgical treatment, CAC: conservative anti-TB therapy; BT: before treatment, AT: 6 months after treatment, FU: at the Final Follow-up.

Inclusion criteria
Patients who were diagnosed with lumbosacral tuberculosis and had not previously received anti-TB therapy and debridement or radical depression surgery were included. The indications for surgery included severe back and/or radicular pain, a developing neurological deficit, significant kyphosis (> 30°), or progressive deformity [13,14].

The method for conservative anti-TB therapy
Most lumbosacral tuberculosis patients could be effectively treated with medication, especially in the early stage of the disease [2–5]. The patients with a highly probable diagnosis who were not confirmed microbiologically or histopathologically but in whom the diagnosis was supported by typical radiographic or clinical features and without operative indications or with surgical contraindication received Isoniazid (5 mg/kg/day, 10 mg/kg in children), Rifampicin (10 mg/kg/day), Ethambutol (15 mg/kg/day), and Pyrazinamide (20 mg/kg/day, 25 mg/kg/day in children) as a standardized and effective anti-TB therapy, sustained for at least 4 months. This was followed by a two-drug anti-TB treatment (Rifampicin and Isoniazid) for 6 to 9 months or longer, until the toxic symptoms improved.

Results

Clinical symptoms
Of the conservatively managed patients, all but two experienced some relief from the toxic symptoms of tuberculosis after one month of treatment with anti-TB drugs. The two remaining patients from this group experienced relief after six months. However, in the surgical patients, the recovery period was significantly shortened, with patients experiencing relief from the toxic symptoms of tuberculosis at a mean time of 5.5 days postoperatively.
Neurological function

On the whole, the neurological deficit did not worsen in any of the patients. Of those conservatively managed patients, there were 5 in grade D who improved to grade E and 1 patient in grade B who improved to grade C. The surgically treated patients achieved obvious improvement: 8 patients in grade B improved to grade E, 9 patients in grade B improved to grade D, 2 patients in grade C improved to grade D, and 19 patient in grade C improved to grade E (including 2 of the children patients). Two patients remained in grade D at the final follow-up (Table 2).

Table 1

<table>
<thead>
<tr>
<th>Preoperative Frankel grade</th>
<th>No. of cases</th>
<th>Neurologic recovery according to Frankel scoring system</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>0</td>
<td>0 0 0 0 0</td>
</tr>
<tr>
<td>B</td>
<td>19(17 1*)</td>
<td>0 2(17) 9(9*) 8(7 1*)</td>
</tr>
<tr>
<td>C</td>
<td>21(17 2*)</td>
<td>0 0 2(27) 19(17 2*)</td>
</tr>
<tr>
<td>D</td>
<td>8(6 3*)</td>
<td>0 0 2(17) 7(5 2*)</td>
</tr>
<tr>
<td>E</td>
<td>4(2 2*)</td>
<td>0 0 0 0 4(2 2*)</td>
</tr>
</tbody>
</table>

This table shows neurologic recovery according to Frankel scoring system
* the conservative adult patients
# the conservative children patients
• the adult patients who underwent anterior debridement, interbody fusion with instrumentation
♦ the adult patients who underwent one-stage anterior debridement combined posterior instrumentation
* the children patients who underwent anterior debridement only.

Discussion

Spinal tuberculosis has been around for a very long time. Despite its common occurrence and the high frequency of long-term morbidity, there are no straightforward guidelines for the diagnosis and treatment of spinal tuberculosis [17]. Most scholars agree that spinal tuberculosis is a “medical condition” [2,5,6,18]. Anti-TB drug treatment has played an important role in the treatment of tuberculosis, especially in the early infectious stage. Furthermore, various studies have shown that the majority of patients (82–95%) of spinal tuberculosis respond very well to medical treatment [17]. Konstam and Rajasekaran [11,19] have shown the positive effects of outpatient treatment with anti-TB therapy. Abhay Nene et al. [6] reported that over 98% of their patients (69 of 70) were successfully treated conservatively, without the need for surgical decompression. In our institution, the patients (including the 11 conservatively managed patients in the present study) with spinal TB who did not meet the surgical indication were treated conservatively as outpatients. Good healing can be achieved after anti-TB drug therapy.

References