

# TUBERCULOUS SPONDYLITIS

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*We treated twelve patients with spinal tuberculosis. The average age was 20.5 years (Range, 3 to 50 years) Five patients had neurological lesions.*

*Our indications for spinal operations were, neurological impairment spinal instability and abscess. Eight patients were operated, six patients decompression plus fusion, two patients, anterior decompression. Four patients treated conservatively. (Chemotherapy plus spinal orthosis). Neurological recovery and relief of pain occurred more rapidly in the surgically treated group. Kyphosis did not worsen in any patient, whether treated medically or surgically.*

**Key Words :** *Tuberculous spondylitis, anterior decompression,*

Spinal tuberculosis has existed for at least 5000 years. The first description of tuberculous spondylitis occurred in medical records of the Indo-Aryan peoples, written in Sanskrit between 1500 and 700 B.C. Sir Percival Pott (1779) was the first to associate spinal deformity with the paralysis that is often seen with this disease. (8,9).

Spinal tuberculosis has become rare in the west, but it is still prevalent in the densely populated parts of Asia and Africa, where it is one of the commonest forms of skeletal tuberculosis. In recent years there has been a sharp increase in the incidence, in our country. The classical picture of disease of two vertebra, with destruction of the intervening intervertebral disc and paravertebral or psoas abscess is recognized and treated. (1,2,3,4,5,6,7,8,9) But there are atypical forms (1,7), none of these atypical patients has any visible or palpable spinal deformity, nor the typical radiographic appearance of destruction of the intervertebral disc and the two adjoining vertebral bodies. (1,3,7) Paraplegia and kyphosis are well known complications of tuberculosis of the spine. (3) Paraplegia usually occurs in the early active phase of the disease, its overall incidence can be 20 to 30 percent. With the advance of effective, combination therapy in the early 1950's, the mortality rate among patients with spinal tuberculosis decreased from approximately 10 per cent.

Although chemotherapy remains the mainstay in the treatment of tuberculous spondylitis, surgical procedures still play an important role. Radical debridement, anterior decompression and anterior fusion has been advocated.

During the past eighteen years, the medical research council of England has been carrying out multi-centre prospective studies of spinal tuberculosis, in Africa And Asia. These studies showed that, 82 to 88

per cent of all patients receiving chemotherapy alone will achieve a favorable result over a three-year period (8). We report our results of the treatment of spinal tuberculosis in 12 patients. We used the regimen of Isoniazid, rifampin, ethambutol for all patients with adjunctive surgical procedures.

## **MATERIAL AND METHODS :**

Twelve patients with tuberculosis of the spine were treated by us at the Orthopaedics and Traumatology Department of Cerrahpaşa Medical School, between March 1987 and March 1990.

There were 12 patients, 7 female and 5 male in the study. The average age was 20.5 years. (Range 3 to 50 years). Seven patients were children.

Five patients were seen with neurological impairment. Four patients had kyphosis and the average angle of kyphosis was 29 degrees. (Range 8 to 52 degrees) The neurological examination showed generalized muscle weakness bilaterally, decreased sensation to pinprick, a negative Babinsky sign bilaterally, in the lower extremities. Laboratory tests resulted normally except for a high sedimentation rate.

On the routine chest X-rays there was not any radiographically demonstrable lesion but the regional radiographs demonstrated a destructive process, involving the bodies of the lumbar and thoracic vertebrae with a paravertebral mass and gibbosity. Computerized axial tomographic studies clearly showed the paravertebral mass and vertebral destruction.

All patients were classified according to the schema of Frankel et al. (Table 1)

According to the radiological findings and positive Montoux tests of these patients diagnosis was established as spinal tuberculosis, and all patients were treated with the following drugs,

-Rifampin ten to twenty milligrams per kilogram, per day maximum 600 milligrams per day.

Neurological status when the patients were first seen

Levels involved	Grade (No)					Total No.
	A	B	C	D	E	
C1 to C2						
C3 to C7						
T1 to T6						
T7 to T12		1	2	3		6
L1 to L5			2	4		6
No bone lesion						
Total		1	4	7		12

Classification According to Frankel et. al.

A. Complete neurological deficit with no sensory, motor, bowel or bladder sparing distal to the spinal lesion.

B. Sparing of some sensation but no motor function distal to the spinal lesion.

C. Sparing of sensation and non-useful motor function distal to the spinal lesion.

D. Sparing of sensation and useful motor function distal to the spinal lesion, and

E. Normal neurologically

- Ethambutol, fifteen miligrams per kilogram per day, maximum 1100 miligrams per day.

- Isoniazid, five to ten miligrams per kilogram per day maximum 300 miligrams per day.

All patients received this drug therapy with additional vitamin B6 (twenty five miligrams per day) for twelve months. Two patients received streptomycin sulphate 1 gr. per day, in addition to the standard triple drug regimen for a month.

We operated 8 of the 12 patients. Our indications for operative therapy were, large vertebral body destruction, a cold abscess, and neurological deficits. In five patients anterior decompression was performed following the drainage of the abscess, then the cavity was irrigated with an antibiotic containing solution. A thorax catheter was inserted through a separate small incision. In one patient continuous irrigation-suction was applied. Two patients also had an anterior fusion at the time of decompression previously resected ribs were used for grafting.

A K-cast corset was applied to all patients, for nine months. Material was taken for histological examination of the bone and for a culture of the involved tissue, from the patients who underwent surgical intervention. Our pre-operative diagnosis was confirmed by

histological examination and by a positive culture of the material. The four patients with kyphosis were followed and evaluated post-operatively, no increase in the degree of kyphosis was seen and there was not any evidence of anterior or lateral subluxation of vertebra. Control radiographs were made once in a month until a bony fusion was seen and then at three-month intervals. The average follow-up period was 14,3 months. Recurrence occurred in a patient and he was reoperated.

## RESULTS :

When the patients were first seen, the average erythrocyte sedimentation rate was thirty milimeters per hour. Five patients had an erythrocyte sedimentation rate of less than ten milimeters per hour. The average white blood cell count was  $5,5 \times 10^3$  per cubic milimeter. The average hemoglobin was 12,6 grams. The hemotological and biochemical profiles yielded no data of importance. The tuberculine test was positive in 75 per cent of the patients. Non of the patients was found to have tuberculosis in an extravertebral site. In all patients, lesions were demonstrated by axial tomography and by conventional radiographs. The average number of involved vertebral bodies was two. Maximum involvement was present with four vertebral bodies only in one patient. Four patients had kyphosis, the average degree of kyphosis as measured by the Cobb technic, was 29 degrees. (Maximum 52 and minimum 8 degrees.) There was no change in the angle of kyphosis during the follow-up period. Four of the five patients who had neurological impairment, underwent operative treatment and recovered completely. To the other patient conservative treatment was applied by means of a corset and the standard antituberculous drugs. This patient also completely recovered and was symptom-free at the end of the treatment.

Seven of the twelve patients demonstrated complete bony fusion radiographically at their last control. The follow-up period of the other five patients was not enough.

## DISCUSSION :

Spinal tuberculosis is primarily a disease of adults in Europe, in North America and also in Saudi Arabia (8). But a marked predominance of incidence was found in African and Asian populations. In Hong Kong 69 per cent of the patients were reported to be less than 10 years old (8).

In our study, which includes only a small number

of patients, 7 patients were children and 5 were adults. Differential diagnosis of spinal tuberculosis is much easier in children, compared to adults. Because spinal diseases resembling spinal tuberculosis are rare in children. But on the contrary, there are many diseases in adults which give similar findings to spinal tuberculosis. Laboratory tests do not always give significant results, but even may be misleading, as a negative tuberculin test. Some atypical forms of spinal tuberculosis without any radiologically diagnostic findings were reported in the literature. (1,2,7) Those cases can be divided into two distinct groups.

Type I: With disease of the neural arch, in which the spinal cord is compressed from its dorsal aspect.

Type II: Consist of extradural, extraosseous spinal tuberculosis, an epidural tuberculoma may compress the cord from in front. In both groups the usual treatment is laminectomy. (1,2,6)

The most important complication of spinal tuberculosis is paraplegia, either of early or late onset. (1,2,3,4,5,6,7,8,9) In our patient group paraplegia was not present. Pre-operative symptoms consisted of muscle weakness, hypoaesthesia and hypoactive deep tendon reflexes only. In one patients a severe motor and sensory loss was present, which completely disappeared after the operation. The high neurological deficit rate in our patients probably due to late referral to the hospital.

All our patients had vertebral lesions with predominant involvement of the lower thoracic and the lumbar spine. Though lumbar involvement was reported to be of low incidence, by some studies (8), our study does not correlate with that.

The overall incidence of paraplegia which usually occurs in the early phase of the disease, can be 20 to 30 per cent, in areas where the disease is endemic. (3) It is known that, all of these patients were treated by anterior decompression and fusion. (2,3,9) Laminectomy is contra indicated in these patients.

All operated patients also used a corset for nine months. Our objectives for corset application were the presence of vertebral lesions in every case and the difficulty of cooperation with the patients. Chemotherapy was administered for 12 months under the surveillance of the pneumophthysiology unit of our hospital. Patients were checked once in a month initially and then at three-month intervals. Our patients especially the ones who had had neurological deficits before surgery and became symptom-free afterwards did not care seri-

ously for the drug therapy. At the end of this controlled treatment only in one patient recurrence occurred and he was reoperated.

Patients who have slight or no neurological deficit and slight kyphosis can be treated with the medical treatment, accompanied with an orthotic support. (4,5,8) especially, in children we support the spine against the strong likelihood of kyphosis and against severe vertebral body loss.

Different results were obtained in a study made in 1985, which was including 123 children with a ten year follow-up (5). In this study some of the patients had been treated with chemotherapy alone, some others with chemotherapy plus bed rest and the rest of the patients had been treated with chemotherapy plus a plaster-of-Paris jacket. At the end of the study no significant difference was found between the methods mentioned above. According to the study, over the 10 year period there was a mean increase in loss 0,51 of a vertebra, nearly all occurring in the first 18 months. No increase was reported in the angle of kyphosis in % 37 of the patients, but 56% the angle increased by 10 degrees or more (7).

In contrast to the efore-mentioned study, in a study of 1984 authors reported their experience of 12 discitis occurring in the newborn and young children. It was reported that, tuberculous spondylitis started in the form of a discitis and then caused a massive destruction especially in the anterior part of the vertebral column but the posterior part remained untouched and continued to grow. This growth disequilibrium and the destruction made by the disease itself resulted in a severe kyphosis It was emphasized that, conservative immobilization of the kyphosis during growth does not prevent any increase in deformity before puberty, and also neurological symptoms may occur. The only possible effective treatment is surgical with anterior arthrodesis of the damaged region together with a corrective osteotomy, followed as soon as possible by posterior arthrodesis.

In our pediatric patients, no increase was found, neither in the angle of kyphosis nor in the vertebral body loss.

We preferred early surgical intervention in the presence of large abscess, a vertebral destruction or a severe spinal cord lesion. We used anterolateral thoracotomy and lumbar incisions in our patients. We supported the spine with a rigid K-cast corset following operation. This external support was discontinued when a bony union occurred.

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