

OUR CONTRIBUTION TO THE SURGICAL MANAGEMENT OF TUBERCULOUS SPONDYLITIS

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Abstract

The authors studied a group of 7 patients (5 men and 2 women) suffering from tuberculous spondylitis who were treated at the Department of Orthopaedic Surgery in 1992 to 1998. The thoracic spine was affected six-times, lumbar spine once.

Three patients were treated with Capener anterolateral decompression. In three patients combined surgery was used (removed structures were replaced by autograft or Harms' mesh and posterior fusion was carried out, using TSRH or Miami instrumentation). In one patient, the inflamed lesion was removed through an anterior approach and the structure was replaced by bone cement reinforced with Kirschner wires. Neurological deficit was found in five patients, two of whom had paraplegia; marked improvement occurred in three cases.

Key words

tuberculosis, spondylitis, surgery

Abbreviations:

TSHR – Texas Scottish Rite Hospital, PAS – para-aminosalicylic acid

INTRODUCTION

Tuberculosis still remains a serious world-wide problem. This applies chiefly to the developing countries of Africa or India. In our country and in western Europe, tuberculosis seemed to be under control until the spread of HIV infection began. With the development of tourism and arrival of immigrants, the possibility of contact with this disease has increased. In addition, the situation is complicated by the fact that, at early stages, the diagnosis of both TB spondylitis and pulmonary tuberculosis is difficult. When the spine is involved, angular kyphotisation of the affected region may result in severe pain and neurological complications. For this reason, early diagnosis is necessary and should be followed by appropriate treatment, i.e., radical management of the lesion on the spine and anti-TB drug therapy. To establish the diagnosis, plain X-rays, bone scan, CT examination and magnetic resonance imaging of the spine are used in addition to standard biochemical tests. The diagnosis is confirmed by histological examination and DNA assessment by PCR.

CASE REPORTS AND METHODS

A group of 7 patients (5 men and 2 women) suffering from TB spondylitis, who were treated at our Department in 1992-1998, were studied. The thoracic spine was affected in six patients and the lumbar spine in one. The average age of patients at the time of operation was 60 years and 9 months (range, 38 to 77 years). The time from the onset of complaints to the establishment of diagnosis was, on the average, 6 months (from 3 to 11 months). After the operation, the patients were followed up for an average period of 2 years and 2 months (range, 6 months to 6 years) and were examined clinically and by means of radiography.

In three patients, Capener anterolateral decompression was the method of choice because of the patients' advanced age and serious, acute neurological lesions. In one patient we used the anterior approach with resection of the inflammatory lesion, replacement by bone cement and reinforcement with Kirschner wires because all the preoperative examinations indicated metastatic lesions of the thoracic spine. Postoperative histological examination, however, revealed TB spondylitis. A combined intervention was selected three-times, with anterior resection of the inflammatory lesion and its replacement by an autograft twice and the use of Harms' mesh filled with autograft once. The posterior surgery involved fusion and two applications of TSRH and one of Miami instrumentations.

Neurological findings were present in five patients (two had paraplegia) and significant improvement occurred in 3 of them. This indicates the necessity of early diagnosis. In prolonged neurological conditions, the return of functions is less probable.

Antituberculous therapy was started before surgery and usually continued for 9 to 12 months (a 4-drug regimen of isoniazid, rifampicin, ethambutol and streptomycin for the first three months, followed by a 2-drug regimen of isoniazid and rifampicin). After postoperative stabilisation of the patients, their therapy continued in a specialised sanatorium until the complete fusion of the graft tissue was achieved.

The course of treatment in four patients is described below.

1. A 69-year-old man was seen at our Department because his diagnosis had been unclear for 11 months. Spondylitis at T9-10 was found with the presence of an abscess. He had developed acute paraparesis of the lower extremities. A course of anti-TB drugs was started, Capener decompression was carried out and he was immobilised in Jewett's orthosis. A significant improvement of neurological findings occurred. At 2.5 years after the operation, his condition returned to normal and he was without any symptoms..

2. A 38-year-old man was admitted because of severe pain; tuberculosis was diagnosed with spondylitis at T9-10. Neurological findings were negative. Two teams participated in the surgical procedure which included necrectomy of the lesion through the anterior approach, replacement of the affected structure by fibular graft, and posterior fixation with TSRH instrumentation. He was operated on during the course of anti-TB drugs and immobilised in Jewett's orthosis. At 2 years after the operation he occasionally complained of low back pain.

3. A 63-year-old woman presented with a pathological fracture of T9 and a transversal medullary lesion. She was operated on by two surgical teams; necrectomy was done through the anterior approach, the lesion was removed and Harms' mesh applied. The spine was fixed with TSRH instrumentation. She was treated with antituberculous chemotherapy postoperatively and immobilised in a Jewett orthosis. After operation, paraparesis of her lower extremities improved and was classified as moderate.

4. A 49-year-old woman was admitted with spondylitis at L2,3. After preoperative preparation, the inflammatory lesion was resected through the anterior approach and replaced by an autograft. The spine was fixed with Miami instrumentation and Jewett's orthosis was applied. The patient was treated with a course of anti-TB drugs. In the postoperative period, improvement in paraparesis of the lower extremities from a moderate to a mild degree occurred.

DISCUSSION

Hodgson et al. reported in 1960 that, in their group of 412 patients treated by the radical resection of lesions and anterior fusion, mortality was only 2.9%. In

another study comprising 100 patients, 93 were healed and complete fusion resulted from the same treatment (4,5). In a recent report from Korea and Hong Kong, the majority of 350 Korean patients with active spinal tuberculosis achieved a good status after chemotherapy (PAS and isoniazid for 18 months or PAS and streptomycin for the first 3 months). The 150 Hong Kong patients underwent a three-drug regimen and were randomised either for radical surgery of the spinal lesion completed with bone grafting or for open debridement. The majority of these patients also experienced good outcomes. The advantage of a radical operation over debridement was that if a deformity occurred, it was less severe (1). Similar results were reported by *Parthasarathy et al.* (8) who compared patients who received only chemotherapy with those undergoing radical anterior resection, bone grafting and chemotherapy (isoniazid and rifampicin). *Yilmaz et al.* (10) found that, in patients with kyphosis related to tuberculosis of the spine, the anterior instrumentation was more effective for the reduction of deformity and stabilisation of the vertebral column than the posterior instrumentation. In children with tuberculosis of the spine, fresh-frozen allografts were used as bone supports of the anterior column (3).

Surgical treatment of tuberculous spondylitis was used by *Chen et al.* (2) in 50 adult patients. Anterior debridement and fusion, followed by posterior fixation, were performed in 14 patients who suffered from the loss of a vertebral body, which resulted in severe kyphosis. Out of 32 patients with neurological disorders, 30 showed improvement. *Upadhyay et al.* (9) showed that a 6-month drug regimen (streptomycin, rifampicin and isoniazid, with streptomycin only for the first 3 months) combined with surgical resection and bone grafting was adequate for the management of spinal tuberculosis.

Moon et al (7) reviewed 39 adults with tuberculous spondylitis. They operated on six patients, using first the anterior and then the posterior approach 3 to 4 weeks apart. In 19 patients, both procedures were carried out on the same day. Progression of the disease ceased and early fusion and correction of the kyphosis occurred. One segment took 4 months to heal, while two segments required 6 months. (4).

Some authors recommend the use of a vascularized rib graft as a bone support through the anterior approach, and osteotomy with fusion and fixation with an internal device to correct kyphosis through the posterior approach (3).

Our study shows that an active approach to the treatment of tuberculosis of the spine gives good results. To prevent neurological and other complications, an early and accurate diagnosis is important and therefore examination for the signs of tuberculosis should be included. In a progressive disease, surgical removal of the inflammatory lesion, replacement by autograft, posterior fusion and fixation with an appropriate device seem to be the best method. Capener decompression is useful particularly in elderly patients who have acute neurological lesions and are generally in bad condition.

NÁŠ PŘÍSPĚVEK K CHIRURGICKÉMU ŘEŠENÍ TBC SPONDYLITIDY PÁTEŘE

S o u h r n

Autoři hodnotí soubor 7 pacientů (z toho 5 mužů) s TBC spondylitidou ošetřených v letech 1992–1998. Šestkrát byla postižena hrudní páteř, bederní páteř jednou.

Nemocní byli ošetřeni Capenerovou operací třikrát, kombinovaným výkonem třikrát (vpředu po resekci zánětlivých ložisek náhradou autoštěpy dvakrát, jednou Harmsovou klíčkou), vzadu fúzí s instrumentací (TSRH, MIAMI), jednou resekci zánětlivého ložiska zepředu s náhradou armovaným cementem. Pětkrát byla přítomna nervová léze (dvakrát paraplegie), třikrát došlo k výraznému zlepšení.

Autoři doporučují při progredujícím onemocnění operační řešení s resekci zánětlivého ložiska a náhradou autoštěpy spolu se zadní fúzí a instrumentací.

REFERENCES

1. A 15-year assessment of controlled trials of the management of tuberculosis of the spine in Korea and Hong Kong. Thirteenth Report of the Medical Research Council Working Party on Tuberculosis of the Spine. *J. Bone Joint Surg.* 80-B: 3, 1998, 456–462
2. *Chen WJ, Chen CH, Shih CH.* Surgical treatment of tuberculous spondylitis. 50 patients followed for 2-8 years. *Acta Orthop. Scand.* 66, 2, 1995, 137–42
3. *Govender S, Parbhoo AH.* Support of the anterior column with allografts in tuberculosis of the spine. *J. Bone Joint Surg.* 81-B: 1, 1999, 106–109
4. *Hodgson AR, Stock FE.* Anterior spine fusion for the treatment of tuberculosis of the spine: the operative findings and results of treatment in the first one hundred cases. *J. Bone Joint Surg.* 42-A: 1960, 295–310
5. *Hodgson AR, Stock FE, Fang HSY, Ong GB.* Anterior spinal fusion: the operative approach and pathological findings in 412 patients with Pott's disease of the spine. *Br. J. Surg.*, 48, 1960, 172
6. *Louw JA.* Spinal tuberculosis with neurological deficit. Treatment with anterior vascularised rib grafts, posterior osteotomies and fusion. *J. Bone Joint Surg.* 72-B:4, 1990, 686–693
7. *Moon MS, Woo YK, Lee KS, Ha KY, Kim SS, Sun DH.* Posterior instrumentation and anterior interbody fusion for tuberculous kyphosis of dorsal and lumbar spines. *Spine* 20, 17, 1995, 1910–1916
8. *Upadhyay SS, Saji MJ, Yau AC.* Duration of antituberculosis chemotherapy in conjunction with radical surgery in the management of spinal tuberculosis. *Spine* 21, 16, 1996, 1898–1903
9. *Yilmaz C, Şelek HY, Gurkan I, Erdemli B, Korkusuz Z.* Anterior instrumentation for the treatment of spinal tuberculosis. *J. Bone Joint Surg.* 81-A: 9, 1999, 1261–1267