



## Tuberculous spondylitis : abscess drainage after failure of anti-tuberculous therapy

Orhan BÜYÜKBEBECİ, Gunhan KARAKURUM, Bahadır DAGLAR, Gokturk MARALCAN, Savas GÜNER, Akif GÜLEÇ

*From Gaziantep University Medical School, Gaziantep, Turkey*

Spinal tuberculous abscesses usually respond to anti-tuberculous drugs. The purpose of this study was to evaluate the results of surgical drainage after failure of first-line anti-tuberculous drugs. Patients with spinal instability or vertebral collapse were excluded from the study. The authors retrospectively reviewed 11 patients. The operation was successful in all patients. Anterior/posterior spinal fusion or curettage was not performed. Drains were removed after two to three days. None of the patients required a second operation. Complications, such as spinal instability, vertebral collapse, or death did not occur.

**Keywords :** tuberculous abscess ; spine ; drug-resistant ; drainage.

### INTRODUCTION

Since a few years the frequency of tuberculous spondylitis (Pott's disease) has been rapidly increasing in Turkey. According to the literature, the thoracic and the thoracolumbar region are most often involved (21).

Pott's disease is the most dangerous form of skeletal tuberculosis. It often leads to abscess formation (4), but at an earlier stage than pyogenic spondylitis (6). Serious complications, often life threatening, have been reported (1, 2, 10-12, 15, 17, 18).

The exact localisation and full extension of the spinal abscess are clearly delineated by means of magnetic resonance imaging (MRI) (6, 19). The

definitive diagnosis is usually based on microbiological tests (6).

Spinal tuberculous abscesses generally respond to anti-tuberculous drugs, without surgery (3, 16). Surgical drainage is only indicated in case of progressive neurologic deficit, marked spinal instability, or failure of medical management (5, 8). Indications and methods of surgery continue to be debated (4). In recent years, image-guided drainage techniques have become increasingly popular in diagnosis and treatment (7, 13, 19).

---

■ Orhan Büyükbeci, MD, Associate Professor of Orthopaedic Surgery.

■ Gunhan Karakurum, MD, Associate Professor of Orthopaedic Surgery.

■ Savas Güner, MD, Orthopaedic Surgeon.

■ Akif Güleç, MD, Professor of Orthopaedic Surgery.

*Department of Orthopaedic Surgery, School of Medicine, Gaziantep University, Gaziantep, Turkey.*

■ Bahadır Dağlar, MD, Associate Professor of Cardiovascular Surgery.

*Department of Cardiovascular Surgery, School of Medicine, Gaziantep University, Gaziantep, Turkey.*

■ Gokturk Maralcan, MD, Associate Professor of General Surgery.

*Department of General Surgery, School of Medicine, Gaziantep University, Gaziantep, Turkey.*

Correspondence : Dr Orhan Büyükbeci, PK 100, Carsi, 27070, Gaziantep, Turkey.

E-mail : orbuyukbeci@yahoo.com.

© 2006, Acta Orthopædica Belgica.

Table I. — Follow-up data

Case	Age	Gender	Level	Type of abscess	Surgical approach	Follow-up in years	Kyphosis	Neurological compromise (pre/post)
1	45	F	T7-T8	para-vertebral	trans-thoracic	5.0	unchanged	-/-
2	28	F	T11-T12	para-vertebral	trans-thoracic	4.7	5° decreased	-/-
3	43	M	L4-L5	psoas	retro-peritoneal	3.6	6° decreased	-/-
4	23	M	L1-L2	psoas	retro-peritoneal	3.2	unchanged	-/-
5	21	M	T10-T11	epidural and para-vertebral	trans-thoracic	3.4	7° increased	+/-
6	30	M	L5-S1	epidural and presacral	Rectus muscle preserving Gibson incision	2.5	5° decreased	+/-
7	34	F	L1-L2	psoas	retro-peritoneal	2.3	unchanged	-/-
8	49	F	L1-L2	psoas	retro-peritoneal	6.4	unchanged	-/-
9	48	M	T11-T12	para-vertebral	trans-thoracic	6.5	8° increased	-/-
10	23	M	L1-L2	psoas	retro-peritoneal	4.6	unchanged	-/-
11	19	M	L3-L4	psoas	retro-peritoneal	5.5	5° increased	-/-

The purpose of this study was to evaluate the results of classical surgical drainage in patients with spinal tuberculous abscess, after failure of anti-tuberculous drug treatment.

### PATIENTS AND METHODS

Between April 1997 and February 2003, 11 adult patients, 7 males and 4 females, with an average age of 33 years (range : 19 to 49), underwent surgical drainage for a spinal tuberculous abscess in our department. Back pain was the main complaint. As a matter of fact, all out-patients with spinal complaints were considered as potential TB cases, because tuberculosis is endemic in Turkey. A careful neurological examination was the rule.

All patients had standard laboratory tests. Plain radiographs showed the affected levels ; they ranged from T7 to S1 (table I). Patients with spinal instability or vertebral collapse were excluded from the study. MRI demonstrated the exact localisation and the full extension of the paravertebral or epidural abscesses (fig 1 a, b and c ; fig 2 a and b ; fig 3). Sputum examination and chest radiographs were routine. The diagnosis was confirmed microbiologically by culture or non-culture methods.

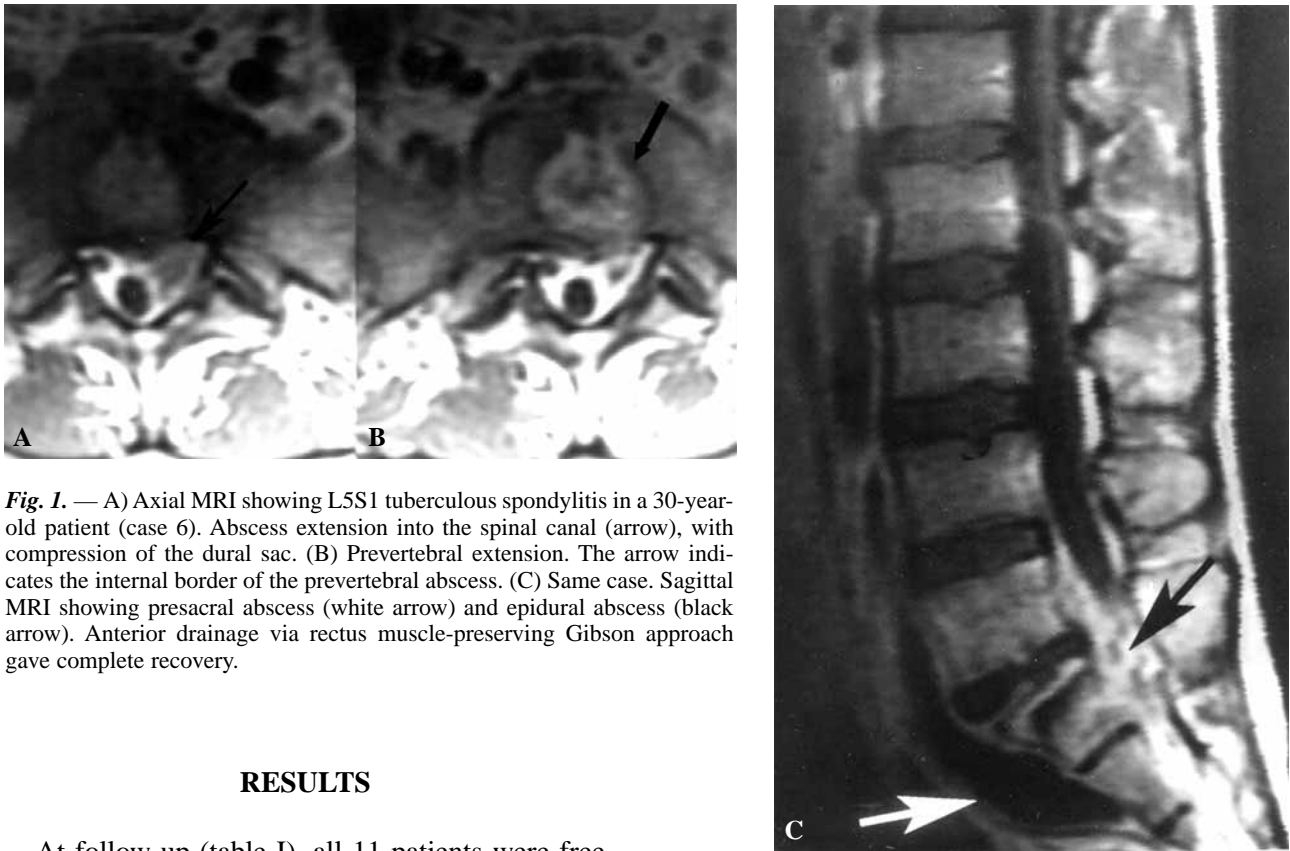
Subsequently, first-line antituberculous drugs (isoniazid, rifampin, pyrazinamide and ethambutol) were started. Subjective pain complaints, C-reactive protein

(CRP), erythrocyte sedimentation rate, serial radiographs and/or MRI served to evaluate the course of the disease.

Surgical drainage was decided if medical treatment was still ineffective after two to three months. Seven out of 11 cases were resistant to rifampin and isoniazid, according to antimycobacterial susceptibility tests ; two of these had neurologic compromise. Two other patients prematurely discontinued the drug treatment for some reason. The remaining two patients took their drugs irregularly.

The surgical approach was chosen according to the level of the tuberculous lesion (table I). A transthoracic approach was used in 4 patients with thoracic involvement, a retroperitoneal approach in 6 patients with lumbar involvement, and a rectus muscle preserving Gibson approach in one patient with a L5S1 lesion with epidural abscess formation and presacral extension. This last case necessitated the help of a general surgeon and a vascular surgeon. The segmental spinal vessels were ligated at all levels, taking care not to injure the aorta and the vena cava. The drains were removed after two to three days. After surgery, all patients received pyrazinamide, ethambutol and amikacin (the latter drug as a second line anti-tuberculous drug). A thoracolumbar brace was worn for three months after surgery.

At final follow-up, after 2.3 to 6.5 years (average : 4.1), the kyphotic angle was compared with the pre-treatment angle.



**Fig. 1.** — A) Axial MRI showing L5/S1 tuberculous spondylitis in a 30-year-old patient (case 6). Abscess extension into the spinal canal (arrow), with compression of the dural sac. (B) Prevertebral extension. The arrow indicates the internal border of the prevertebral abscess. (C) Same case. Sagittal MRI showing presacral abscess (white arrow) and epidural abscess (black arrow). Anterior drainage via rectus muscle-preserving Gibson approach gave complete recovery.

## RESULTS

At follow-up (table I), all 11 patients were free of symptoms without sinus formation, recurrence or need for re-operation. The two patients with an epidural abscess and neurological compromise recovered completely. Complications, such as spinal instability or vertebral collapse did not occur.

The kyphotic angle remained unchanged in 5 patients ; it increased by 5° to 8° in 3 patients ; it decreased by 5° to 6° in 3 other patients.

## DISCUSSION

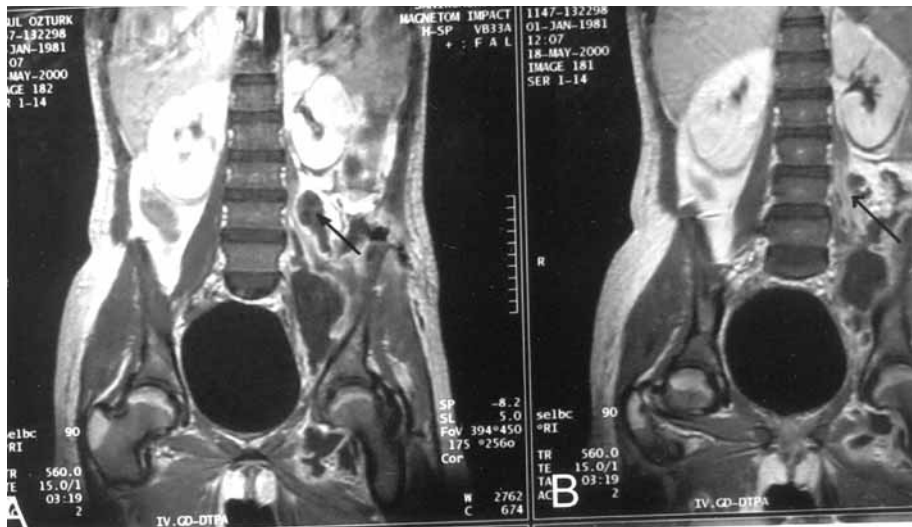
During the last decade, treatment of tuberculous infections has become more complex because of increased resistance to the classical medication. Inadequate or incomplete treatment is the common cause of drug resistance. Delaying treatment can have serious or even fatal consequences for the patients.

Many orthopaedic surgeons recommend that at first anti-tuberculous drugs should be tried for the treatment of tuberculous abscesses. Indeed, prima-

ry abscesses without bone destruction can heal with conservative means (3, 16).

A cold abscess can form when the infection extends to adjacent ligaments and soft tissues. If left untreated, the abscess can invade the retropharyngeal space, the psoas muscle, the mediastinum, Scarpa's triangle (trigonum femorale), the epidural space, the presacral space and Petit's triangle (trigonum lumbale). This can lead to lethal conditions, such as acute respiratory distress syndrome (17, 18), major artery erosion (10), neurologic compromise (1), and airway obstruction (11, 17). A large presacral abscess with epidural extension and neurological deficit has been reported by Büyükbeci *et al* (5).

For all these reasons, and more specifically because of failure of medical management, operative treatment was undertaken in the 11 patients described above.



**Fig. 2.** — (A) Coronal MRI showing psoas abscess on the left (arrow) in a 19-year-old patient (case 11) with L3L4 spondylitis. (B) Same patient. Retroperitoneal drainage was performed.



**Fig. 3.** — Coronal MRI showing large psoas abscess on the left (arrow) in a 43-year-old patient with L4L5 spondylitis (case 3). Hypertrophic fibrous tissue. Retroperitoneal drainage.

As to neurological compromise, two patients recovered completely after surgical drainage and second-line medication; conservative treatment had not improved their condition. Generally speaking, patients with limited involvement (Frankel grade C or D) (9) can be treated by chemotherapy alone, but they should be monitored very strictly; if the neurologic deficit gets worse during chemotherapy, immediate surgical drainage should

be performed. Patients with Frankel grade A or B should be treated by rapid surgical decompression (4, 14, 20).

In recent years a few authors have successfully treated paravertebral abscesses with image-guided percutaneous drainage (7, 13). The authors have no experience with these new techniques. However, in most cases conventional surgical drainage allows direct exposure and effective drainage.

In children, fusion of the affected area is indicated in order to prevent late kyphotic deformity, but adults are less likely to develop kyphosis (4), so that fusion was not performed in the current series. This led to an acceptable kyphotic angle, as mentioned above.

MRI may lead to misinterpretation of the post-operative scar tissue as a recurrence (19). This is why the authors preferred to monitor the response to therapy by means of CRP (C-reactive protein), erythrocyte sedimentation rate and plain radiographs.

## CONCLUSION

Surgical drainage is a valuable tool for the treatment of spinal tuberculous abscesses, if medical management remains ineffective.

## REFERENCES

1. Akalan N, Ozgen T. Infection as a cause of spinal cord compression : a review of 36 spinal epidural abscess cases. *Acta Neurochir (Wien)* 2000 ; 142 : 17-23.
2. Baker AS, Ojemann RG, Swartz MN, Richardson EP Jr. Spinal epidural abscess. *N Engl J Med* 1975 ; 293 : 463-468.
3. Bhojraj S, Nene A. Lumbar and lumbosacral tuberculous spondylodiscitis in adults. Redefining the indications for surgery. *J Bone Joint Surg* 2002 ; 84-B : 530-534.
4. Boachie-Adjei O, Squillante RG. Tuberculosis of the spine. *Orthop Clin North Am* 1996 ; 27 : 95-103.
5. Büyükbekci O, Karakurum G, Gulec A, Erbagci A. Tuberculous osteomyelitis of the lumbosacral region : a spinal epidural abscess with presacral extension. *Arch Orthop Trauma Surg* 2004 ; 124 : 346-348.
6. Desai SS. Early diagnosis of spinal tuberculosis by MRI. *J Bone Joint Surg* 1994 ; 76-B : 863-869.
7. Dinc H, Ahmetoglu A, Baykal S *et al.* Image-guided percutaneous drainage of tuberculous iliopsoas and spondylodiskitic abscesses : midterm results. *Radiology* 2002 ; 225 : 353-358.
8. Guven O, Yalcin S, Karahan M, Esemeli T. Transpedicular drainage of Pott's abscess. A report of two cases. *Am J Orthop* 1995 ; 24 : 421-425.
9. Frankel HL, Hancock DO, Hyslop G *et al.* The value of postural reduction in the initial management of closed injuries of the spine with paraplegia and tetraplegia. *Paraplegia* 1969 ; 7 : 179-192.
10. Inufusa A, Mikawa Y, Morita I, Fujiwara T. Ruptured abdominal aortic aneurysm associated with a psoas abscess. *Arch Orthop Trauma Surg* 2002 ; 122 : 306-307.
11. Jang YJ, Rhee CK. Retropharyngeal abscess associated with vertebral osteomyelitis and spinal epidural abscess. *Otolaryngol Head Neck Surg* 1998 ; 119 : 705-708.
12. Kooli H, Marreckchi M, Tiss M *et al.* Cold parapharyngeal abscess in spondylodiscitis. *Presse Med* 2001 ; 30 : 19-21.
13. Korenkov M, Yucel N, Schierholz JM *et al.* Psoas abscesses. Genesis, diagnosis, and therapy. *Chirurg* 2003 ; 74 : 677-682.
14. Lifeso RM, Weaver P, Harder EH. Tuberculous spondylitis in adults. *J Bone Joint Surg* 1985 ; 67-A : 1405-1413.
15. Mathur NN, Bais AS. Tubercular retropharyngeal abscess in early childhood. *Indian J Pediatr* 1997 ; 64 : 898-901.
16. Nene A, Bhojraj S. Results of nonsurgical treatment of thoracic spinal tuberculosis in adults. *Spine J* 2005 ; 5 : 79-84.
17. Pollard BA, El-Beheiry H. Pott's disease with unstable cervical spine, retropharyngeal cold abscess and progressive airway obstruction. *Can J Anaesth* 1999 ; 46 : 772-775.
18. Prasad RS, Fraser MH, Urquhart GD, McLean AN. Rupture of tuberculous spinal abscess resulting in tuberculous empyema and chylothorax. *Spinal Cord* 2003 ; 41 : 410-412.
19. Rothman SL. The diagnosis of infections of the spine by modern imaging techniques. *Orthop Clin North Am* 1996 ; 27 : 15-31.
20. Tuli SM. Results of treatment of spinal tuberculosis by "middle-path" regime. *J Bone Joint Surg* 1975 ; 57-B : 13-23.
21. Turgut M. Spinal tuberculosis (Pott's disease) : its clinical presentation, surgical management, and outcome. A survey study on 694 patients. *Neurosurg Rev* 2001 ; 24 : 8-13.