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Anterior spinal tuberculosis: paraplegia following laminectomy

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Summary

Of 16 patients with anterior spinal tuberculosis treated in this unit during the period 1979–1984, five presented with neurological complications following laminectomy at another hospital. After the decompressive laminectomy all five patients developed an increasing kyphosis, and four of the five patients had deteriorated neurologically. They were transferred to our unit where the four with neurological deterioration underwent surgical stabilisation. This paper illustrates the dangers of posterior spinal surgery in the presence of anterior disease.

Introduction

The purpose of this paper is to present five cases of spinal tuberculosis who presented with neurological signs and were all treated by laminectomy. The complications of these operations and their subsequent management are described.

Epidural compression is a well-recognised and treatable feature of spinal tuberculosis. The classical description of the disease by Pott in 1779 *(1)*, affecting two adjacent vertebral bodies and the intervening disc accounts for the majority of cases of spinal tuberculosis *(2)*. Hodgson *et al. (3)* proposed that extrinsic compression of the cord is caused either by an active disease process (liquid or caseous abscess, sequestered bone and disc material, and pathological subluxation or dislocation of a vertebra), or by the consequences of healed disease (transverse ridges of bone anterior to the cord associated with a kyphotic deformity and possible dural fibrosis). Deteriorating neurology is an indication for anterior decompression *(4,5)*. Some surgeons, however, persist in performing decompressive laminectomies for this condition.

We reviewed 16 patients who presented to this hospital between 1979 and 1984 with tuberculosis of the spine.

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All patients had tuberculosis of the spine proven on culture or histology. They were all treated on a standard regimen of rifampicin, isoniazid and ethambutol.

Of the 16 patients, five had first presented to another hospital with the complications of acute cord compression, where they had undergone posterior decompressive laminectomies. Subsequently, they were transferred to our unit for the further management of their unstable spines.

Patients and methods

The five patients who underwent laminectomy all presented with neurological complications of their disease (Table I). The mean time between onset of symptoms and admission was 20 weeks (range 1–50 weeks). Only in one patient (Case 1) were there no changes on plain radiographs. There was a complete block on myelography in all cases.

All these patients underwent emergency decompressive laminectomies, the outcomes of which are summarised in Table II. In the immediate postoperative period there was neurological deterioration in four of the five patients. One patient became completely paraplegic; as a result of this he underwent a second, wider laminectomy. In all patients, associated with the worsening neurology was an increase in the kyphotic deformity at the level of the laminectomy. The mean kyphotic angle 2 weeks after surgery at the time of transfer to this unit was 57° (range 31–80°). In one patient, whose neurology improved following laminectomy, the kyphotic angle had increased from 10° to 31°.

The four patients in whom the neurology had deteriorated were maintained initially on bed rest, two having halo traction because of the level and severity of the deformity. All four patients then had posterolateral fusions with autologous iliac crest bone graft across the transverse processes, pars interarticularis and lateral

TABLE I *Summary of five patients treated by laminectomy for spinal tuberculosis*

Patient *Age*	*Sex* *Race*	*Duration of symptoms*	*Spinal level*	*Bone changes*	*Neurology*	*Myelography*	*Preoperative diagnosis*	*Operation*
1. TB 50	Female Black	13 weeks	L5	L4–L5 collapse kyphus minimal	Spastic paraparesis	Complete block	Metastatic carcinoma	Laminectomy
2. DD 52	Female Asian	50 weeks	T2	T1–T2 collapse kyphus minimal	Spastic paraparesis	Complete block	TB	Laminectomy
3. VH 37	Male Black	28 weeks	C7	C7–T1 collapse kyphus minimal	Spastic paraparesis + weak hand intrinsics	Complete block	TB	Laminectomy
4. SC 20	Female Black	1 week	T4	Nil seen on X-ray	Spastic paraparesis	Complete block	Intradural neurofibroma	Laminectomy
5. VP 26	Male Asian	8 weeks	T6	T6–T7 collapse 26° kyphus	Spastic paraparesis	Complete block	TB	Laminectomy + second wider laminectomy

TABLE II *Results of five patients treated by laminectomy*

	Postoperative status		*Management*		*Total hospital stay*	
Patient	*Neurological*	*Bony*	*Initial*	*Surgical*		*Results*
1. TB	Increased paraparesis	35° kyphus	Plaster bed	Posterolateral fusion	22 weeks	Full neurological recovery 10° kyphus
2. DD	No change	31° kyphus	Bed rest	Nil	16 weeks	Full neurological recovery 28° kyphus
3. VH	Increased paraparesis	72° kyphus	Halo traction	Posterolateral fusion maintained on halo traction	26 weeks	Residual paraparesis 48° kyphus
4. SC	Increased paraparesis	48° kyphus	Bed rest	Posterolateral fusion plus Harrington instrumentation	15 weeks	Full neurological recovery 22° kyphus
5. VP	Complete paraplegia	T6 subluxed on T7 60° kyphus	Halo traction	Posterolateral fusion plus Harrington instrumentation	26 weeks	Full neurological recovery 15° kyphus

margins of the remains of the laminae and the facet joints. The area of the midline defect was not disturbed. Two patients then continued on bed rest for a period of 10 weeks. In the last two cases, to permit earlier mobilisation, parallel Harrington rods under distraction were inserted with the hooks two levels above and below the lesion. The patients were then mobilised in a polythene jacket. Radiographs from Case 5 illustrate the initial disease process, the consequences of posterior surgery, and the results of salvage surgery (Figs. 1–5).

Results

The five patients were seen at review. The mean duration of hospital stay following their initial decompression was 21 weeks (range 11–31 weeks). Mean follow-up was 5.6 years (range 3.2–7.9 years). At review all five patients were asymptomatic with no evidence of recurrent disease. Of the five, four had made a complete neurological recovery, the remaining patient (Case 3) required the use of a walking-stick because of residual motor weakness of the legs. Radiologically, there had been no loss of correction of the kyphotic deformity and the fusion mass was satisfactory in all cases.

Discussion

Hsu and Leong *(5)* reported on 40 cases of cervical tuberculosis of whom the three patients treated by laminectomy had their paresis made worse. Our small series again confirms the dangers of decompressive laminectomy in the presence of anterior spinal disease.

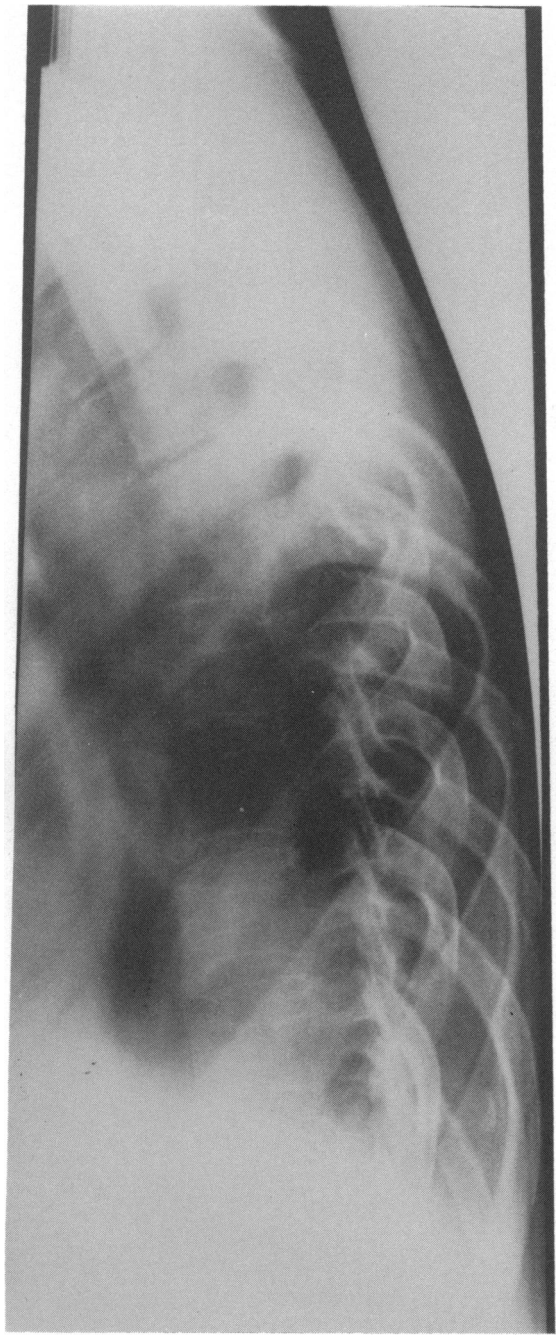

FIG. 1

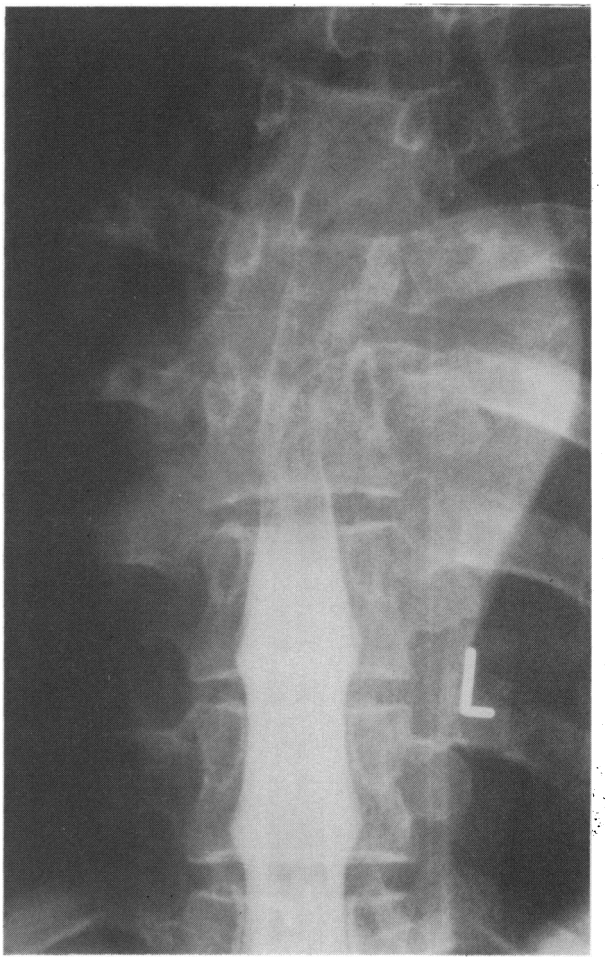

FIG. 2

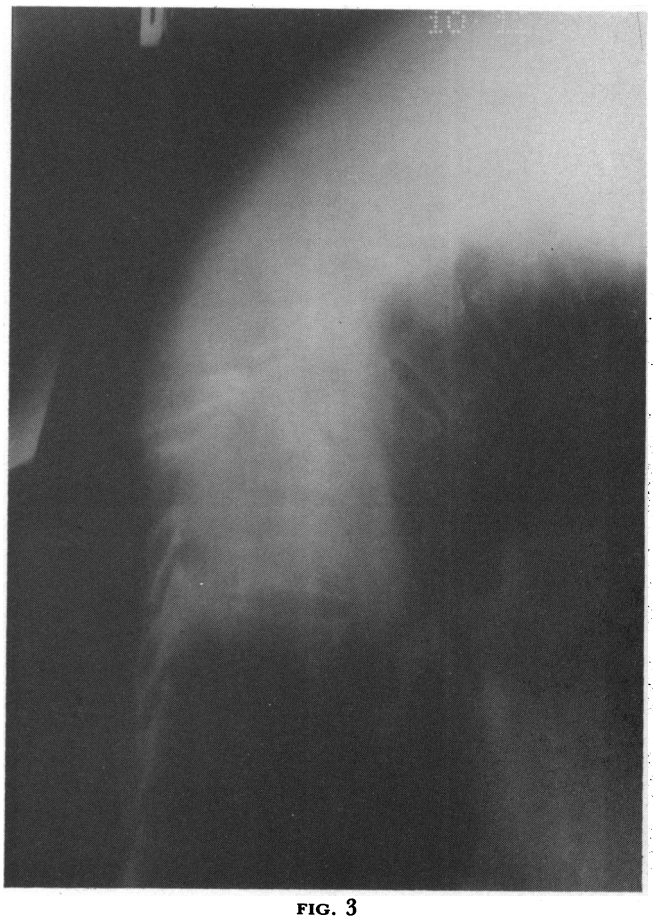

FIG. 3

It should be emphasised that the surgical treatment of spinal tuberculosis by anterior clearance and fusion will also relieve secondary cord compression. Simple relief of cord compression by laminectomy, without the primary problem of anterior instability being addressed, will almost inevitably lead to disaster.

A further 11 patients were treated primarily in this unit, three of whom presented with neurological complications of their spinal tuberculosis. There were bony changes on plain radiography, and complete blocks on myelography at the levels of the spinal involvement. They had anterior decompression and interbody autologous bone grafting as described by Hodgson and Stock *(4,6)* and advocated by the Medical Research Council Working Party on Tuberculosis *(7,8)*. At operation, following exposure of the affected adjacent vertebrae, the

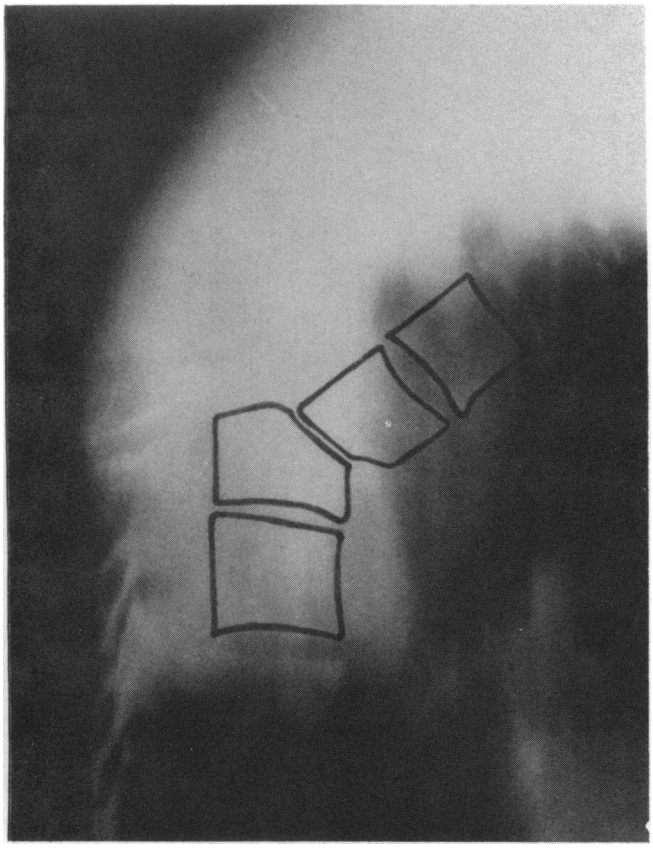

FIG. 4

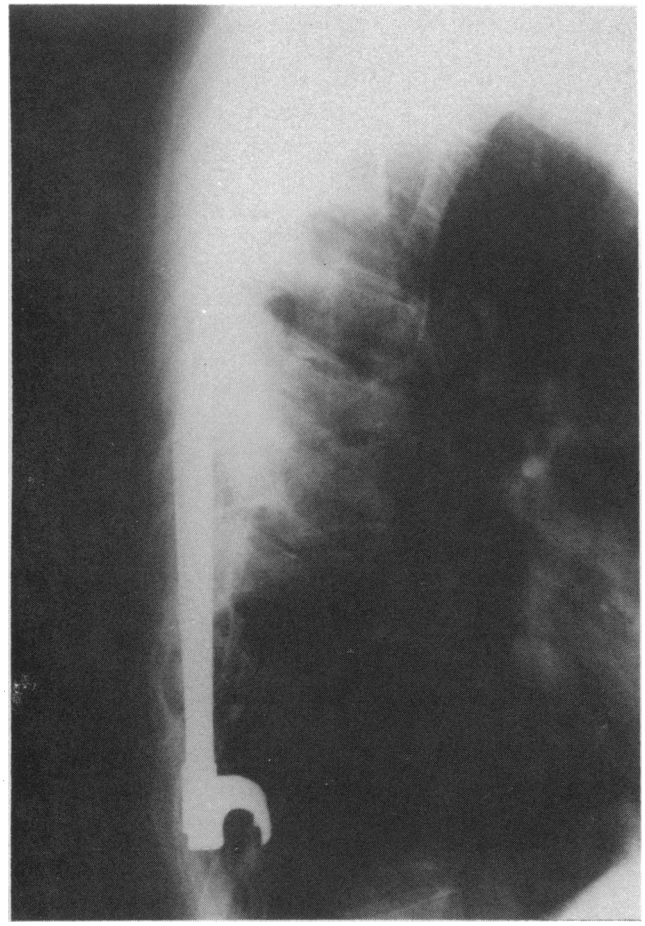

FIG. 5

FIG. 6

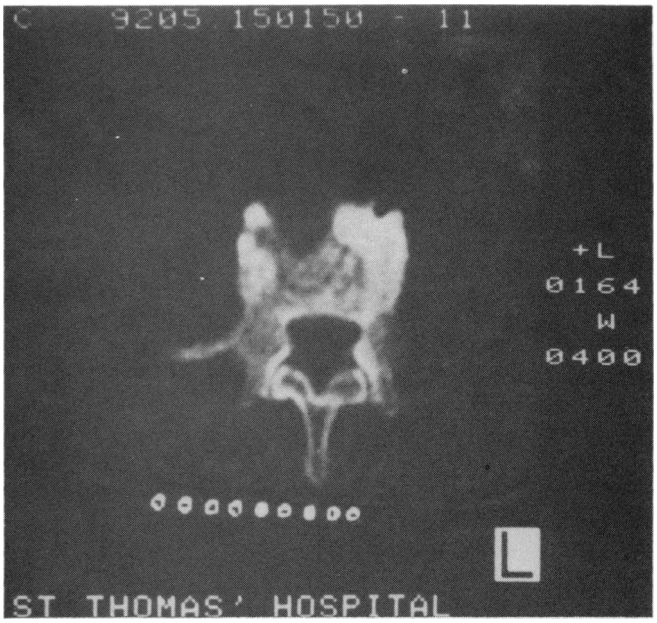

FIG. 7

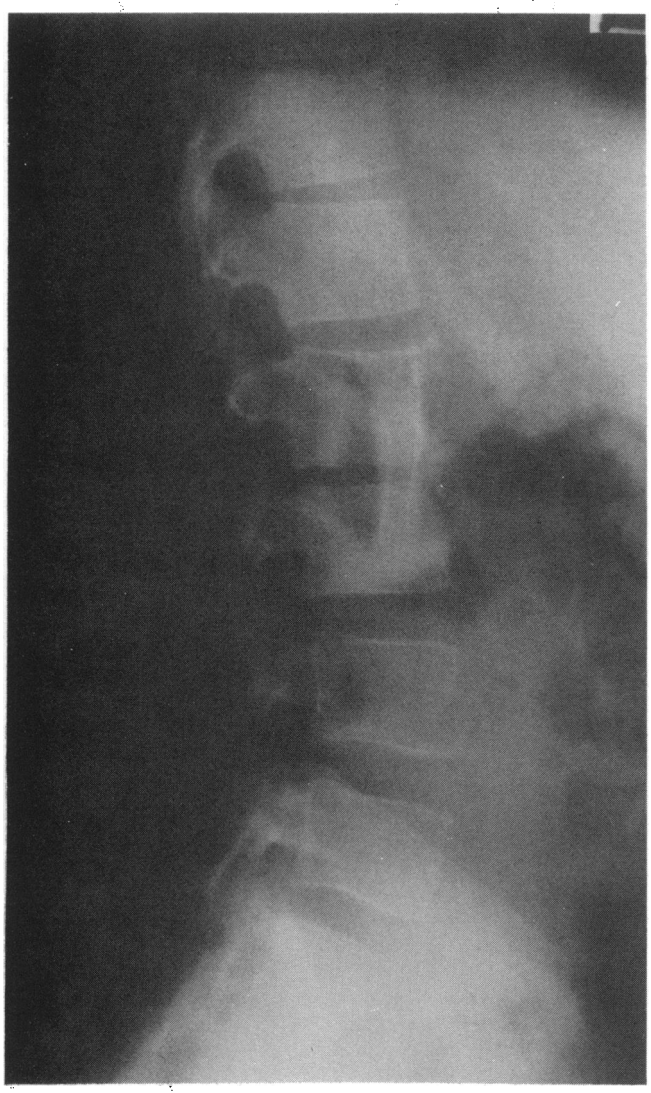

FIG. 8

area of infection was excised down to bleeding cancellous bone and the dura decompressed anteriorly. The gap between the vertebral bodies was then bridged by iliac crest bone graft (Figs. 6–8). The patients were then treated by bed rest for 6 weeks, after which they were mobilised in an appropriate orthosis; all made a full neurological recovery. When reviewed 3 years after operation they were asymptomatic and radiological examination confirmed a solid bony fusion and no kyphosis.

Conclusion

Patients with anterior spinal tuberculosis with neurological complications require a myelogram and a CT scan or MRI before progressing to anterior surgery with clearance of diseased tissue and decompression, followed by interbody fusion using autologous bone graft. In the presence of anterior disease posterior decompression is contraindicated.

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