

Surgery for multiple myeloma of the spine

A retrospective analysis of 12 patients

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We report on 12 surgically treated patients with myeloma of the spine. Pain relief was obtained in all the patients. Paraparesis was present in 5 patients. All 12 patients subsequently became ambulatory. The average postoperative survival was 2.3 years. Eight

patients, all without symptoms from the treated lesion, survived for more than 1 year.

Our experience suggests that surgical treatment of multiple myeloma of the spine may be rewarding.

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Submitted 91-07-24. Accepted 91-11-09

Myeloma is the most common primary tumor of the spine (Weinstein et al. 1987). Initially, the lesion can be solitary (plasmacytoma), but in time the disease usually becomes generalized with multiple lytic lesions (Oken 1984, Harrington 1988). The most common presenting clinical symptom is skeletal pain from the vertebrae or ribs (Kyle 1975). The incidence of paraparesis is about 10 percent (Silverstein et al. 1963, Cohen et al. 1975).

We report our results in 12 surgically treated cases of vertebral myeloma: all of them had pain and 5 were paraparetic.

Patients and methods

From 1981 to 1989, we operated on 12 patients with myeloma/plasmacytoma of the spine (Table 1). In 5 patients (Cases 2, 4, 6, 7, and 12), trauma had initiated pain, which led to the diagnosis. The spinal lesion was the first symptom of the disease in 8 cases. Radiation or chemotherapy or both were given preoperatively in Cases 3, 8, and 9, and postoperatively in all 12 cases.

Six cervical lesions and one thoracic lesion (Case 10) were primarily treated with anterior excision of the tumor growth and reconstruction of the anterior support. In three lumbar and one thoracic lesion (Case 9), a posterior approach was used for the initial

Table 1. Symptoms and survival in patients treated for spinal lesions caused by myeloma

Case	Sex	Age	Level	Paraparesis/ tetraparesis preop ^a	Para- paresis postop	Alive	Survival months
1	M	60	S1	—	—	A	108
2	M	55	C2	—	—	A	96
3	M	68	C5	3	—		3
4	M	44	C3	—	—		24
5	F	76	L1	—	—		12
6	M	62	C2	—	—		27
7	M	72	C2	—	—		6
8	M	74	C5	1	—		1 ^b
9	M	78	T9	2	1		3
10	M	80	T4	—	—	A	16
11	M	69	L1	1	—	A	14
12	F	59	L4	1	—	A	20

All patients had pain preoperatively, none postoperatively.

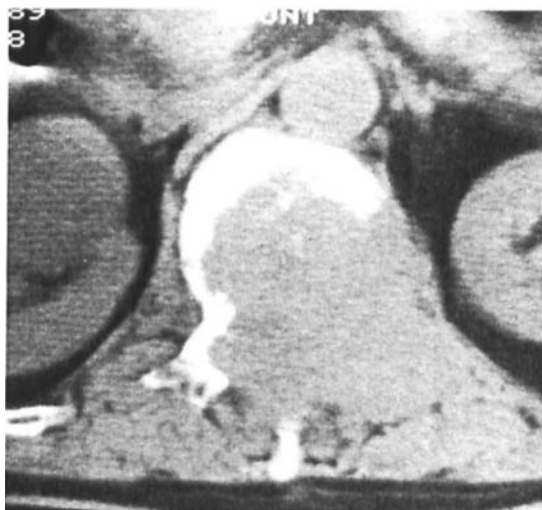
^aNeurologic function according to the Brice-McKissock (1965) classification:

1. Mild, patient able to walk.
2. Moderate, able to move legs but not against gravity.
3. Severe, slight residual motor and sensory function.
4. Complete, no motor, sensory, or sphincteric function below the lesion of the cord.

^bDied of heart failure.



Destruction of L1 and mild paraparesis.



CT shows tumorous destruction and infiltration of the vertebral body and left pedicle. The tumor is growing into the spinal canal.



Posterior stabilization was performed as an emergency procedure. The kyphosis was reduced and stabilized with a transpedicular posterior segmental fixation (PSF) device. A laminectomy was performed, and the histopathologic studies showed a myeloma.



To ensure lasting stability, the anterior support was reconstructed with a homologous bone graft after radiotherapy.

Figure 1. A 69-year-old man with pain and mild paraparesis of 24 hours' duration.

stabilization, and if necessary, reduction with a transpedicular device (Case 11, Figure 1). Later, an anterior reconstruction was performed in all the patients but one (Case 12). Case 9, in which the tumor was mostly epidural, a laminectomy, tumor evacuation, and posterior stabilization were carried out. Acrylic cement was

used for the anterior reconstruction in 7 cases and homologous bone in 3 cases. The average length of the follow-up period was 5 (1-9) years. The clinical and radiographic findings were evaluated in 5 surviving patients. The 7 deceased patients were evaluated by collating the medical records and radiographs.

Results

All the patients with neurologic symptoms improved and became ambulatory. Pain relief was excellent in all the patients. In Case 7, with the lesion at the C2 level, a tracheostomy and assisted ventilation were required postoperatively for 1 week. Otherwise, there were no complications.

At the follow-up examination, no patient had a recurrence of symptoms from the treated area. No signs of loss of stability or failure of the reconstruction were observed except for one broken pedicular screw (Case 12). One asymptomatic local recurrence was detected radiographically 7 years after the operation in a previously surgically treated lesion (Case 1). The mean postoperative survival was 28 (1-108) months. Finally, three quarters of the patients survived for 1 year, and half of the patients survived for 3 years.

Discussion

In our series, 11 of the 12 patients had vertebral body collapse, including 4 of the 5 patients with paraparesis. The anterior operation was chosen as the primary treatment in the cervical spine, where this approach allows easy access, and the surgical trauma is minor (Riley 1973, McAfee et al. 1987, Sjöström et al. 1990a). In the thoracolumbar spine a posterior transpedicular device was usually applied primarily, because the anterior approach is a major surgical intervention. Usually, the first operation was performed more or less as an emergency procedure, with the exact nature of the primary tumor unknown. By using a posterior transpedicular device, reduction of the collapsed vertebra was accomplished, resulting in an indirect anterior decompression and stabilization by posterior neutralization (Sjöström et al. 1990b).

Posterior stabilization, however, only temporarily compensates for the lack of anterior support, and it may eventually fail (Onimus et al. 1985, 1986). For patients without anterior support and who have a relatively long life expectancy, as in myeloma, anterior stabilization should regularly be added, and even if posterior stabilization was chosen primarily. This was done consistently in our series.

Pain relief was excellent as in other series of patients with metastatic disease of the spine treated by similar principles (Harrington 1981, Kostuik 1983).

All 5 of our patients with paraparesis improved and became ambulatory. Dahlström et al. (1978) treated 19 myeloma patients by laminectomy, and one third of them fully recovered. In other comparable studies (Unander-Scharin et al. 1978), stabilization was added to the laminectomy, and neurologic improvement was observed in two thirds of the patients.

The average postoperative survival was similar to that reported from unselected patients with multiple myeloma (Kyle 1975). However, the survival was longer in our patients than in the series of Dahlström (1979) and Unander-Scharin (1978).

We recommend that patients with myeloma and vertebral collapse be considered for surgical treatment especially when paraparesis is present.

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