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Spinal Cord Compression in Myelomatosis: Response to Chemotherapy Alone

CLIVE L. SINOFF and AUBREY BLUMSOHN

Baragwanath Hospital and the University of Witwatersrand, P.O. Berthsham 2013, *South Africa*

Abstract—*Current management of spinal cord compression due to multiple myeloma usually involves irradiation with or without decompressive surgery. We report five patients (three of whom were severely affected) with a neurological deficit due to spinal cord compression by multiple myeloma, who regained ambulation and sphincter control with melphalan and prednisone alone. The dramatic response in these cases, as well as other evidence presented, suggests that systemic treatment may have a major role in the management of spinal cord compression by sensitive malignant tumours.*

INTRODUCTION

SPINAL CORD compression occurs in about 10–20% of patients with myeloma [1–6] and myeloma is the cause of spinal cord compression in approx. 7% of cases with extradural cord compression by tumour [7–13].

Radiotherapy or decompressive surgery has invariably been employed as emergency therapy in these patients and is currently considered 'standard' treatment [14–17]. The role of systemic treatment is unknown. We report five consecutive patients with spinal cord compression as the presenting feature of multiple myeloma in whom dramatic neurological responses occurred during treatment with melphalan and prednisone alone.

CASE REPORTS

The main haematological and neurological features are summarized in Table 1. All patients fulfil the diagnostic criteria of myeloma. Although patient 2 was reported to have only 6% plasma cells on the bone marrow aspirate, the abnormal morphology of these cells, the presence of multiple lytic bone lesions and vertebral collapse, as well as an IgG paraproteinaemia, confirm the diagnosis. The clinical diagnosis of extradural spinal cord compression was confirmed myelographically in patients 1, 3 and 4.

The duration of symptoms of weakness was recorded in four patients, varying from 2 weeks to 2 months. Patients 1–3 had loss of bladder sphincter function, whereas patient 4 reported diminished bladder sensation; sphincter function was normal in patient 5. The paralysis was complete in patient 3, and very severe in patients 1 and 2 both of whom showed only a flicker of muscle activity. Patient 4 had moderate paresis, unable to walk but able to move his legs against gravity. Patient 5 also had moderate paresis, able to walk with difficulty when supported.

At the initial consultation, patients 1–3 were in a poor clinical state, dehydrated and hypercalcaemic, with urinary or respiratory infections, precluding surgery or transfer for irradiation. The prognosis for neurological recovery was considered hopeless.

All patients were treated with intermittent oral melphalan (15 mg daily for 4 days) and prednisone (150 mg daily for 4 days); therapy was repeated at three weekly intervals for three cycles, then four to six weekly. Progressive return of neurological function concurrent with, or subsequent to, the improvement in the general condition allowed the omission of local therapy in patients 1–3. Patients 4 and 5 were electively treated with melphalan and prednisone alone, despite the absence of contraindication to local therapy.

In four of the patients there was a subtle improvement in motor function within 14 days. Case 3, however, is of interest as the first flicker of muscle movement was only noted 8 weeks after the start of chemotherapy; further recovery was steady but slow and only after 8 months was he able to walk unaided. No patient showed evidence of disease progression or neurological deterioration while under our care (Table 1). No further information about the dur-

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Send correspondence to: Dr. Clive L. Sinoff, Northeastern Ontario Oncology Program, 41 Ramsey Lake Road, Sudbury, Ontario P3E 5J1, Canada.

Table 1. Features of patients with myeloma and spinal cord compression

Feature/Case No.	1	2	3	4	5
Age (years)	60	71	65	40	45
Sex (M/F)	F	M	M	M	M
Myeloma features					
Percentage plasma cells in marrow	15	6	47	52	80
Comments	Bizarre plasma cells	Bizarre plasma cells	Many bizarre cells	Abnormal plasma cells	Atypical plasma cells
Serum paraprotein (g/l)	31 IgG	27 IgG	49 IgA	Neg.	80 IgG
Urine paraprotein	Neg.	Neg.	Neg.	Neg.	Neg.
Lytic lesions/vertebral collapse	Yes	Yes	Yes	Yes	Yes
General clinical state	Poor	Very poor	Poor	Good	Good
Neurologic features					
Severity	Total paraplegia	Total paraplegia	Total paraplegia	Moderate paresis. Not amb	Moderate paresis. Amb
Duration of symptoms	2 mths	2 wks	2 mths	1 mth	?
Bladder involvement	Yes	Yes	Yes	Partial	No
Clinical level	L2	T4	T8	T4/T12	T4/T7
Myelographic level	T12	ND	T10/L5	T4/T11	ND
Response to treatment					
Time to first suggestion of response	7 days	14 days	8 weeks	3 days	A few days
Time to bladder control	?*	?*	12 wks	Few days	—
Time to ambulation	3 wks	8 wks	8 mths	7 days	2 wks
Duration of response	>1 year	>14 wks Lost to follow up	>9 months	>3 months	>2 months

Neg.—Negative; ?—not recorded; ND—not done; amb—ambulant; mth(s)—month(s); wk(s)—week(s).
*Bladder control achieved, dates not recorded.

ation of neurological or haematological response or pattern of relapse is available, as both authors left their appointments in July 1987.

DISCUSSION

The prognosis for neurological recovery (and survival) in a patient with neoplastic compression of the spinal cord is essentially dependent on tumour type and the severity of the neurological deficit. In general, patients with tumours which are radiosensitive (and incidentally chemotherapy sensitive) have better neurological recovery than those with tumours which are radioresistant (and chemotherapy resistant) [9, 18]. Thus, of patients with lung cancer (type not specified), only about 20% will become ambulant [9, 11, 12, 19, 20]. However, of patients with lymphoma, breast cancer or prostatic cancer, approx. 50% will walk after radiotherapy and/or surgery [9, 18–22]. The results in patients with multiple myeloma are among the more favourable groups (Table 2). Even in this group, at best only half the patients will be ambulant after therapy.

Table 2. Proportion of patients with myeloma and spinal cord compression ambulant after radiation and/or surgery

Author	Reference	Ambulant/ Total	(%)
Brenner	[3]	9/17	(53)
Brice	[20]	16/30	(53)
Benson	[23]	19/45	(42)
Dahlström	[24]	6/19	(32)
Cumulative series with >10 patients	[8, 12, 25, 36]	17/47	(36)

The severity of weakness is of crucial prognostic value. Where severity is mild and the patients are ambulant, up to 60% wll be ambulant after treatment [7, 9, 10, 12, 20, 22]. In contrast, a favourable outcome occurs only in approx. 30% of patients with residual motor function, but who cannot walk (moderate severity) [12, 20]. In paraplegic or severely paraparetic patients, 0–20% will walk again [7, 9, 10, 12, 20, 22]. Severity is of

prognostic importance even in patients with more favourable diseases. Neurological recovery would not normally have been anticipated in the first three of our patients with any form of therapy, and possibly not in the last two either.

TREATMENT

Many reported series of patients with spinal cord compression are difficult to interpret because of the variety of tumour types, the different degrees of severity encompassed, and unstated criteria for response [19, 35]. Furthermore, the presentation of results does not always allow the separation of effects due to different modalities [2, 3, 5, 6, 9, 12, 18, 20, 23, 26]. In fact, most studies fail to state what cytostatic therapy if any had been prescribed.

Isolated reports in the literature suggest that spinal cord compression by sensitive tumours may respond to systemic therapy alone. Spinal cord compression due to lymphomas, malignant thymoma and seminoma has been reported to respond to glucocorticosteroids alone [27, 28]. Whether corticosteroids have a nonspecific role by reducing spinal cord oedema remains unresolved [9, 19, 29, 30]. Neurological responses in patients with lymphomas to single agent cytostatic therapy have also been reported [30–32]. Similarly, paraplegia due to prostatic carcinoma has been well reported to respond to hormonal manipulation [33, 34]. However, apart from that of a single patient who is reported to have responded to urethane [22], we are unable to find any reports of patients with spinal cord compression by myeloma treated with systemic therapy alone.

CONCLUSION

Our findings, albeit in a small number of cases, show that systemic treatment may provide initial results as good as those reported for radiotherapy and/or surgery in patients presenting with spinal cord compression by myeloma. Objective tumour response occurs in 30–50% of patients treated with melphalan and prednisone and possibly in up to 70% treated with other combinations, including those containing adriamycin [37, 38]. It follows that a substantial proportion of patients would not be expected to have neurological recovery when treated with chemotherapy alone. Nevertheless, this may not be worse than the results of local therapy (Table 2). Perhaps it is unreported systemic treatment which is providing the majority of neurological benefit in previous studies reporting irradiation and/or surgery in spinal cord compression due to multiple myeloma or other chemotherapy sensitive diseases. The role of systemic therapy certainly requires evaluation.

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