

A case of occipitocervical fusion in myeloma

Richard Löfvenberg¹, Eva B. Löfvenberg² and Olof Ahlgren¹

Posterior fusion (from occiput to C4) with an iliac graft on the right side and methyl methacrylate on the left side was performed in a 49-year-old woman with an osteolytic destruction of the second vertebral body caused by multiple myeloma. Thirty months after the fusion, the patient remains free from pain, although there is progression of the osteolytic lesion, now extending to the third vertebral body.

Bone pain is present in 68-75 percent at the diagnosis of multiple myeloma (10,12) and characteristic punched-out lesions occur in 70 percent of the patients. Cervical vertebral involvement (Table 1) has been reported although thoracic involvement predominates in myeloma patients with paraparesis (7,12). Surgery must be considered in the treatment of vertebral and cord lesions, when systemic therapy fails or when there is a major instability (2,13).

Case report

A 49-year-old woman with an IgA myeloma diagnosed in 1977 was treated with melphalan and prednisone periodically until 1983. No skeletal destructions were recorded until 1984, when she presented with pain in the neck and numbness of her left hand. Radiographs revealed destruction of the second cervical vertebral body.

Cytostatic treatment, as well as maximal irradiation, was given immediately resulting in lowering of the myeloma protein and plasma-cell content in the bone marrow. One year later, after 3 months without chemotherapy, surgery was undertaken because of severe pain and progression of the vertebral destruction with extreme risk of collapse (Figure 1).

Posterior fusion between the occiput and C4 was

performed under general anesthesia (Figure 1) using methyl methacrylate (Palacos[®]) on the left side and an iliac corticocancellous graft and bone chips on the right side. Bilateral steel wires drawn between bore holes through the lamina externa in the occiput and the spinous process of C4 served as a reinforcement for the bone cement and held the bone graft in place, a modification of the surgical technique reported by Brattström and Granholm (4) for stabilizing atlantoaxial subluxation in rheumatoid arthritis. The patient was mobilized free from pain on the second postoperative day wearing the ISSAL[®] type of Halo vest (1). Seventeen months after surgery, chemotherapy was repeated for another period of 10 months because of clinical and radiographic progression.

Although the vertebral body destruction 30 months after surgery includes both C2 and C3, the patient has no pain and no further neurologic deficit (Figure 1).

Discussion

Stabilization of the cervical spine with polymethyl methacrylate (PMMA) has been tested biomechanically in specimens (16,17). The weakest points are at the ends of the fixation. A PMMA construction decreases in strength with time, whereas a bony fusion increases in strength (22). To combine early mobilization with increasing strength, a combination of the two grafting techniques was introduced by Brattström and Granholm (4), and was used in our patient.

Departments of Orthopedics¹ and Internal Medicine²
Umeå University Hospital, S-901 85 Umeå, Sweden

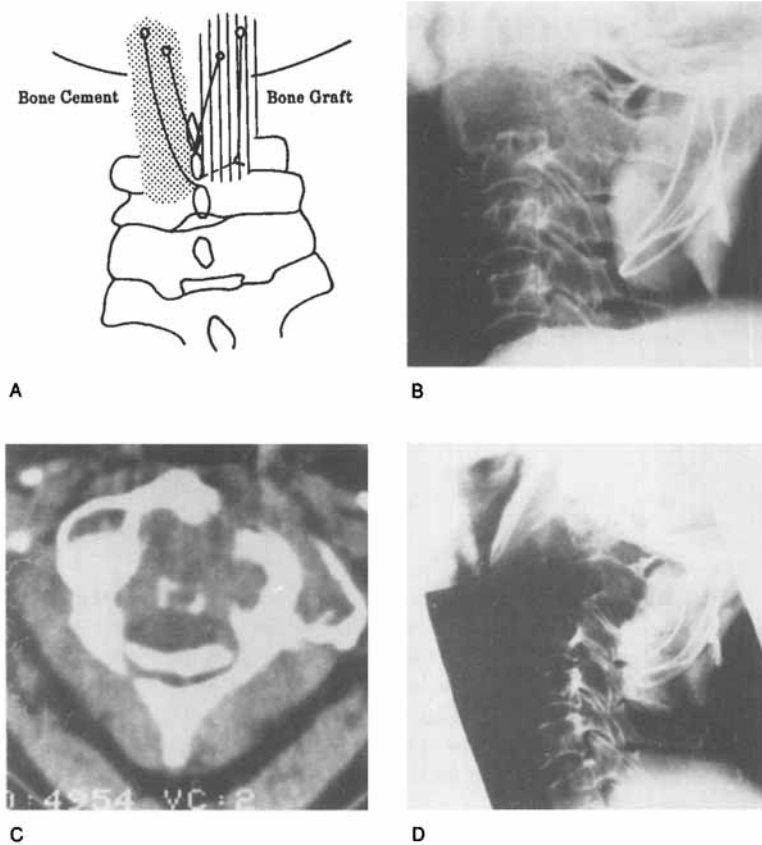


Figure 1. A 49-year-old woman with a 7-year history of multiple myeloma.

A. Operative technique.

B. Destruction of C2 stabilized with posterior bony fusion and cement (methyl methacrylate).

C. Preoperative CT. The tumor mass is infiltrating not only the vertebral body, but also the prevertebral space.

D. Postoperatively 2.5 years. No vertebral collapse, although the osteolytic lesion includes C3. The patient has no pain and no paresis.

The duration of postoperative external support has in earlier reports varied from 0 to 12 months (Table 1). Because of the total destruction of the second vertebral body at the time of surgery and the great risk of tetraparesis, our patient was treated in a Halo vest for 3 months.

Multiple myeloma is not yet a curable systemic disease and progression of osteolytic lesions is always to be expected. On the other hand, long-term symptomfree survival is possible with adequate chemotherapy and sometimes radiotherapy (15). At present the osteolytic lesion of our patient includes total destruction of the second and third cervical vertebra (Figure 1). The cervical spine is still well stabilized as the posterior bony fusion includes occiput and C4.

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Table 1. Methods of treatment of myeloma destructions involving cervical vertebrae

A	B	C	D	E	F	G	H	I	J	K
3	54 F	C2?	4	?	4	2	?	3/3	36 †	Died of myeloma.
5	56 M	C3-4	1	1,2/1	1	2	C2-5	3/3	24	Fibular graft.
6	50 M	C5	1,2	1/?	3	1	C5	none	12	Allowed to walk 1st postop day.
8	58 M	C2	1	?	2	1	C1-3	?	9	Initially stabilized with bone graft. Due to failed fixation reop. with acrylic stab.
	75 M	C4	1,4	?	3	1	C4	?	129 †	Later loss of new fixation. Solitary plasmacytoma, C3-C5 laminectomy, relief of neck and arm pain, died after recurrence and spread of tumor.
	50 M	C5	1,2	?	3	1	C5	?	36	Painter returned to work 1 month postop.
9	22 M	C5-6	1,5	2/	2,3	2	?	3,5/3	48	
	46 F	C5-7	1	1,2/	3	2	?	4/1 + 4/2	48	Local recur., graft intact.
	56 M	C2	1	2/	2,3	2	?	6/3 + 12/2	60 †	
	58 M	C5	1,6		3	2	?	?/1	15	
11	51 M	C6	2	/2	3	1	C6	none	6 †	Died of pulmonary inf.
13	48 M	C6	1,7	/2	3	2	C6	?	42	
14	57 M	C3-5	1,7	/1,2	2	2	C2-7	1/5 + 2/1	34	Bone bank rib grafts used, wears cervical collar.
16	57 M	C7	1,4	?	2,3	1	C2-T2	?	84 †	Died of progression of the myeloma.
18	56 M	C2	1,7	2/	2,3	2	C1-4	2-3/?	48 †	No symptoms postop.
19	30 M	C5-6	1,2	1/1	3	1	C5-6	3/?	?	
20	44 M	C7	1,2,6	/2	2	1	C5-Th1	?	1 †	Died of myocardial and pulmonary infarcts.
21	76 M	C3	1,7	?	1	3	C2-C4	?	13 †	

A Author	E Therapy (Pre./Post.)	H Level of surgery
B Age and sex	1 Chemotherapy	I External support (Month/Type)
C Level	2 Radiotherapy	1 Halo cast/west
D Symptoms	F Method of surgery	2 Two poster
1 Neck pain	1 Anterior fusion	3 Minerva
2 Arm pain	2 Posterior fusion	4 Lightweight collar
3 Paresthesias	3 Anterior fusion with replacement	5 Traction
4 Quadriparesis	4 Transoral	J Follow-up (month)
5 Spasticity	G Material	† Dead
6 Paresis	1 Methylmethacrylate	K Comment
7 Weakness	2 Bone	
	3 Ceramic prosthesis	

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