A study of anterior decompression and stabilization in tumors of spine

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Abstract:
A prospective study was performed in all patients with spinal tumours in Govt. General Hospital, Chennai, from November 2005 to June 2006. These patients underwent anterior decompression and instrumentation with cemented titanium cage and zeta system. The patients with three column involvement had an additional posterior stabilization with Hartshill rectangle. Pre operative, post operative and follow up plain x rays (AP and lateral views) were studied. ASIA score was used to evaluate these patients. MRI or CT was used to define the vertebral body involvement and canal compromise. Surgery was offered only if the neurological compression was anterior. During the seven month study period, three patients with spinal tumours underwent anterior decompression and stabilization with cemented titanium cage and zeta system. Surgical treatment of spinal tumours by anterior decompression and stabilization is an accepted treatment.

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Introduction

The tumours of spine usually present with high morbidity and mortality. In the past, the goal was largely limited to providing histological diagnosis, neural decompression and palliation of pain. It is now technically feasible to resect tumours completely from all levels of spine, while simultaneously restoring stability by reconstruction of the resected segments. The impact of surgery on improving survival is clearly shown in the sub set of patients with localized tumours and solitary metastasis, in whom long term palliation and cure are achievable if all gross tumours are surgically removed. From a review of series of published literature, it is clear that the anterior approaches are more effective than posterior approaches in improving the neurological deficit and survival of the patient.

The clinical spectrum in patients with spinal tumours is such that the treatment has to be individualized for each patient. Although a single anterior approach may suffice in most patients, radiographic studies may demonstrate three column involvement or marked instability of spine in few patients for which a combined anterior and posterior decompression is necessary.

Clinical materials and methods

A prospective study was performed in all patients with spinal tumours, who underwent anterior decompression and instrumentation with cemented titanium cage and zeta system. A patient with three column involvement had an additional posterior stabilization with Hartshill rectangle. The study was conducted in Govt. General Hospital, Chennai, from November 2005 to June 2006. The average age of patient was 40 (17- 55 yrs). All the three patients were male. One patient had complete paraplegia and the other two had incomplete lesions. Pre operative, post operative and follow up plain x rays (AP and lateral views) were studied. ASIA score was used to evaluate these patients. MRI or CT was used to define the vertebral body involvement and canal compromise. Surgery was offered only if the neurological compression was anterior.

Surgical technique

The spine was approached anteriorly via thoracotomy and/or retro peritoneal exposure, depending on the location of the lesion. Decompression was achieved by removal of the involved vertebra and their adjacent discs. The extent of decompression required was determined by examining the pre operative CT or MRI and by intra operative observation. After the decompression a cemented titanium cage was inserted in the space created by tumour resection after correcting the kyphosis. It was further stabilized with a zeta system having two screws and a rod. A gap of several millimeters was left between the cage and the duramater to protect the neural elements from the exothermic effects of acrylic polymerization.

Most patients were able to go home 2 weeks after surgery. Before discharge the physical therapist worked with the patients and instructed them on proper techniques of getting in and out of bed and walking independently. Patients were instructed to avoid bending at the waist, lifting more than 5 pounds and twisting in the early post operative period (2 to 4 weeks), to avoid a strain injury. They gradually began to bend, twist and lift weights after 4 to 6 weeks as the pain subsided and the back muscles got stronger. The patients were given a Taylor's brace or a lumbar corsette that provided additional support in the post operative period.

Results

During the seven month study period, three patients with spinal tumours underwent anterior decompression and stabilization with cemented titanium cage and zeta system. The tumour types were Ewing's sarcoma, multiple myeloma and chordoma. The level of vertebral involvement was 2 in lumbar region, 1 in dorsal region. All the patients underwent one level vertebral decompression. One patient had pre operative radiotherapy

and chemotherapy while another patient had pre operative chemotherapy alone. All the patients had post operative chemotherapy and/or radiotherapy.

Post operatively one patient had a retro peritoneal collection and another patient developed grade 1 sacral sore. There were no major post operative complications. The neurological status as reflected by ASIA score is tabulated below:

Sl no.	Patient details	Diagnosis	Neurological status scale	Motor	Sensory PPS	Sensory LTS	ASIA imp
1.	Mr B, 17/M	Ewing's sarcoma (L2)	Pre op	80/100	76/112	76/112	D
			Follow up	90/100	94/112	94/112	D
2.	Mr V, 55/M	Multiple Myeloma (D4)	Pre op	50/100	44/112	44/112	A
			Follow up	50/100	44/112	44/112	A
3.	Mr G, 47/M	Chordoma (L5)	Pre op	86/100	112/112	112/112	D
			Follow up	90/100	112/112	112/112	D

PPS – pin prick sensation; LTS- light touch sensation

After surgery the patients were mobilized with aids. The pain was markedly decreased in all the patients. Three patients had good neurological recovery and one patient did not have any recovery.

Conclusion

Surgical treatment of spinal tumours by anterior decompression and stabilization is an accepted treatment now a days. Many research studies demonstrate greater than 70% good or excellent results. Most patients have significant improvement of their back pain and ability to walk and function after surgical intervention. Laminectomy alone was not found to be of any benefit due to its destabilizing effect on already unstable spine and secondly due to inadequate decompression.

We now have a better understanding of the tumour biology and there have been significant advances in surgical approaches and reconstructive techniques. Thus it is clear that anterior approach is better than any other approach because it provides direct resection and reconstruction, greater pain relief in patients, good neurological improvement and increased length of survival (Cooper et al [2]; Sundaresan N et al[3]).

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Case 1: Ewings sarcoma in a 17 year male at L2

AP view

Lateral view

Post operative picture

Case 2: Multiple myeloma at D4 in a 55 year old male

MRI showing the three column involvement with cord transection

Postoperative AP & lateral view of global stabilisation after decompression

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