Volume : 2 | Issue : 7 | July 2013 • ISSN No 2277 - 8179

Functional Outcome Following Stabilization in Secondaries Spine

Medical Science

KEYWORDS : Spine, Metastases, Stabilization, Carcinoma

Dr Ranganath C	Associate Professor , Dept of orthopaedics , MS Ramaiah medical college and hospital , Bangalore 560054 .
Dr Ravi Kumar	Resident Orthopaedics , #29 ,2nd floor , 4th cross , Cariappa layout ,Rmv 2nd stage , Bangalore 560094
Dr Angshuman Khanna	Resident Orthopaedics , SWAGAT , JP Agarwala road , Bharalumukh , Guwahati , Assam – 781009
Dr Gautham Kiron T	Resident Orthopaedcis , # 672 , 14th cross , 8th main , JP Nagar ,2nd phase , Bangalore

ABSTRACT

INTRODUCTION: Palliative surgeries for metastatic spine tumors are becoming increasingly popular. The essential objective is to provide a good quality of life, pain relief and restore ambulatory status.

MATERIALS AND METHODS : We present a case series of 11 patients with spinal metastasis who have undergone spinal stabilization by posterior instrumentation. Of the eleven patients, neurological deficits were present in six patients and all had significant pain. These patients underwent thorough clinical, radiological and metastatic workup. Post surgical adjuvant therapy were given.

RESULTS : There were no perioperative or immediate postoperative deaths . A comparison of the visual analog score showed the mean score to have come down significantly . No deterioration of pre-existing neurological status in any patient. Comfortable ambulation was observed in all but two patients .

CONCLUSION : Palliative spinal stabilization is a useful procedure to provide immediate relieve pain and ambulation in patients with spinal metastasis and instability. It may be combined with adjuvant therapy to improve quality of life.

INTRODUCTION

Metastatic bone disease is a major contributor to the deterioration of the quality of life of patients with cancer; it causes pain, impending and actual pathological fractures, and loss of function, and may also be associated with considerable metabolic alterations. After the lungs and liver, the skeleton is the most common site for metastatic disease (1,2) . Prostate, breast, lung, kidney, and thyroid cancers account for 80 % of all skeletal metastases (1-3). The femur, spine, humerus , pelvis, ribs, and skull are reported to be the most commonly affected sites, in that order(4-6) . The prolonged survival of more patients with cancer has led to increasing number of individuals with metastatic bone disease.

The majority of metastatic bone lesions can be and are treated effectively with nonsurgical modalities such as radiation therapy, chemotherapy, immunotherapy, hormonal therapy, bone-seeking isotopes, and Bisphosphonates (7) . Studies have now yielded Level-I evidence on the efficacy of surgery for metastatic disease of the spine for improving quality of life and outcomes in patients with spinal metastasis(8) . The goals of surgery are to achieve local tumor control and structural stability of the surgically treated site and to restore function as quickly as possible. Ideally, operative treatment should allow immediate function and weight-bearing with the least possible morbidity and rehabilitation. Operative reconstruction in patients who have bone metastases must also be reliable and durable in accordance with the expected duration of survival (9)

The indications for operative treatment of spinal metastases include

- spinal instability
- progressive neurological deficit
- intractable pain that is unresponsive to non operative treatment
- lesion that is not responsive to radiation therapy

Patchell et al. performed a randomized non blinded multi-institutional study to evaluate the efficacy of operative treatment and radiation therapy compared with that of radiation therapy alone in patients with spinal metastasis and spinal cord compression and concluded that decompressive surgery and postop radiation were superior than later.(10)

Research findings continue to identify appropriate candidates for surgical intervention for metastasis spinal disease as well as to define optimal surgical and radiation therapy techniques. In considering treatment methods it is essential to account for factors such as tumor type , extent of disease ,neurological status ,an individual patients expectations , quality of life and life expectancy (8)

Anterior decompression and stabilization is the accepted method of treatment for patients who have vertebral metastases with neurological compromise due to epidural compression (11) . However, anterior decompression of the thoracic or lumbar spine is associated with a high rate of morbidity. The perioperative mortality rate has been reported to be about 10 per cent. Studies have found that results in terms of immediate and sustained neurological recovery were similar in posterior approach as compared to anterior but with less morbidity (12). Patients who have extensive metastatic or cardiovascular disease are not ideal candidates for an anterior procedure. Posterior decompression combined with stabilization with segmental instrumentation has been proposed as an alternative (12).

We present the immediate post-operative evaluation of 11 cases of metastatic disease in the spine treated with posterior instrumentation. We compared preoperative ambulatory status, pain levels and preoperative neurological status with postoperative levels. Our goal was to determine whether posterior instrumentation as a palliative surgery in spine metastases could provide meaningful improvement in pain control and ambulatory status as an immediate post-operative period .

MATERIALS AND METHODS

Eleven patients who were managed operatively from August 2009 to September 2011 for spinal metastases were evaluated prospectively.

There were two men and nine women, and the mean age was forty-four years (range, twenty-two to sixty-five years). The most common primary tumour was Squamous cell carcinoma of the cervix (in five patients), followed by one case each of basal cell carcinoma of the nasal ala, adenocarcinoma of breast and one renal cell carcinoma . Three cases presented with unknown primary at the time of detection of the spine lesion. The thoracic spine was involved in only one case; and eight patients had the

lesion involving the lumbar spine and two patients had multi level involvement .(Fig 1 and 2 about here)

Pre-operatively, pain was the predominant complaint in all the patients, with neurological deficits being present in 6 patients. Of these two patients had paraparesis . In the other four patients, isolated monoparetic findings were present.

The operative treatment consisted of a primary posterior stabilization without bone-grafting, using pedicle screws, connecting rods and cross-connectors, with or without a posterior decompression depending on the need for it. The decompression was In the form of a laminectomy at the involved vertebral level. It was carried out in seven of the eleven patients, with an additional neural foraminal decompression in one patient. Stabilization was done spanning two vertebra above and two below the involved vertebral level(s) , except in one case where we had to go one level further below because of absence of adequate hold for one pedicle screw.(Fig 3 and 4 about here)

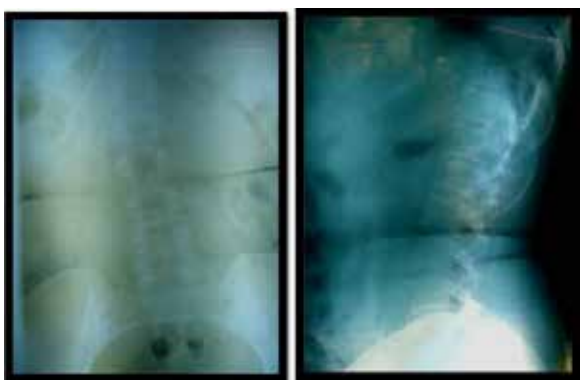


Fig 1 : Preop x ray



Fig 2 : MRI SPINE Sagittal and Coronal cuts of same patient

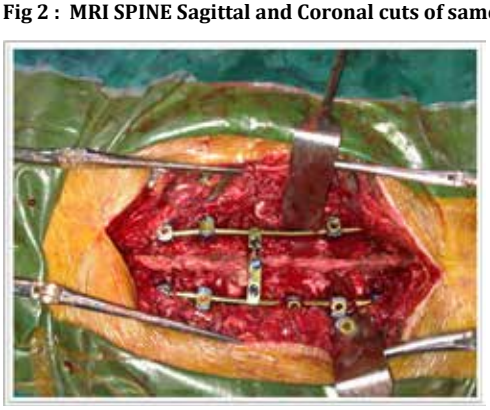


Fig 3 : Primary posterior stabilization, using pedicle screws, connecting rods and cross-connectors of the same patient



Fig 4 : Post op x ray of the same patient



Fig 5 : Post op clinical pic :- Ambulation by day 3

Postoperatively, all patients were mobilized with the use of spinal brace by the third post-operative day (Fig 5 about here). The median duration of hospitalization post-operatively was nineteen days (range, seven to thirty five days). All patients received radiation therapy post-operatively, and one patient received additional chemotherapy for adenocarcinoma breast.

Post-operatively, patients were assessed for pain levels using the Visual analog scale (VAS), and a repeat neurological examination was done. A score of 1 was given for mild or no pain (0–3) , a score of 2 was given for moderate pain (4–6), and a score of 3 was given for severe pain (7–10). Findings were compared with pre-operative values assessed prior to surgery. In all patients, an attempt at ambulation was made with the use of walking support.

RESULTS

Complications

There were no perioperative or immediate postoperative deaths (within fourteen days). The only complication noted was wound infection in one patient, leading to a non-healing ulcer, for which a primary wound debridement and secondary wound closure had to be done.

Post-op neurological status

No deterioration of neurological status was observed in any of the patients post-operatively. In the four patients with pre-operative isolated monoparetic neurological deficits, the deficits persisted or improved marginally. One patient with paraparesis pre-operatively, with inability to sit or stand, was able to do the

same with the help of spinal brace and support in the immediate post-operative period. The other patient with paraparesis had no neurological improvement . In the neurologically uninvolved patients, no post-operative deficits were noted.

Pain

A comparison of the visual analog scores showed the mean score to have come down from 2.6 pre-operatively to 1.1 post-operatively. All the patients gave a positive response when asked as to if the pain levels had come down significantly post surgery.

Ambulation

Eight of the eleven patients were non-ambulant on presentation. All the patients were made to ambulate with the help of walking support within the 4th post-operative day. Comfortable ambulation was observed in all but two patients ; further two patients had no requirement for any walking supports. In one of the two patients where walking could not be achieved, a significant improvement from the pre-operative paraparetic, non-ambulant state was observed. She could sit comfortably with the help of spinal brace.

DISCUSSION

We report the successful management of 11 patients treated with palliative posterior spinal instrumentation for secondaries of the spine. Almost all patients had a statistically significant improvement in ambulatory status as well as pain levels after their stabilization. Deterioration of neurological function was arrested in the respective patients, along with some improvement in neurological status in one.

It is important to maintain proper oncologic perspective when managing this patient population. Many of these patients do not have long life to live, and the goal must be to improve or maintain their quality of life during the remaining time. This concept is predicated on the notion that appropriate staging and diagnostic work-ups have been performed prior to rendering treatment. A biopsy should be performed and cultures should be sent before deciding on and rendering treatment.

Close consultation with medical and radiation oncologist is an important component care in these cases. Survival expectations must be discussed and the treatment rendered tailored to each individual case. Local radiation is often an important adjuvant in the setting of spinal metastases as per tumor sensitivity.

The most consistent result of operative intervention is alleviation of pain (13) . Our study demonstrates the immediate post-operative successes associated with palliative surgery for spine metastases. However, longer follow up is needed to assess whether local failure, whether from tumor regrowth or hardware failure, becomes a problem.

REFERENCE

1. Manoso MW, Healey JH. Metastatic cancer to the bone. In: DeVita VT, HellmanS, Rosenberg SA, editors. Cancer. Principles and practice of oncology. 7th ed.Philadelphia: Lippincott Williams and Wilkins; 2005. p 2368-80.. | 2. Dorfman HD. Metastatic tumors in bone. In: Dorfman HD, Czerniak B, editors.Bone tumors. St. Louis: Mosby; 1998. p 1009-40 | 3. Hage WD, Aboulafia AJ, Aboulafia DM. Incidence, location, and diagnostic evaluation of metastatic bone disease. Clin Orthop North Am. 2000;31:515-28, vii | 4. Bauer HCF. Controversies in the surgical management of skeletal metastases.J Bone Joint Surg Br. 2005;87:608-17. | 5. Geschickter CF, Maseritz IH. Skeletal metastasis in cancer. J Bone Joint Surg Am. 1939;21:314-22. | 6. Toma CD, Dominkus M, Nedelcu T, Abdolvahab F, Assadian O, Krepler P, KotzR. Metastatic bone disease: a 36-year single centre trend-analysis of patient admitted to a tertiary orthopaedic surgical department. J Surg Oncol.2007;96:404-10. | 7. Houston SJ, Rubens RD. The systemic treatment of bone metastases. Clin Orthop Relat Res. 1995;312:95-104 | 8. Han Jo Kim, MD, Jacob M. Buchowski, MD, MS, Charbel D. Moussallem, MD, and Peter S. Rose, MD, Modern techniques in treatment of patients with metastatic spine disease. THE JOURNAL OF BONE & JOINT SURGERY volume 94-A . number 10 . may 16, 2012 | 9. Sherry MM, Greco FA, Johnson DH, Hainsworth JD. Breast cancer with skeletal metastases at initial diagnosis. Distinctive clinical characteristics and favourable prognosis. Cancer. 1986;58:178-82. | 10. Patchell RA, Tibbs PA, Regine WF, Payne R, Saris S, Kryscio RJ, Mohiuddin M, Young B. Direct decompressive surgical resection in the treatment of spinal cord compression caused by metastatic cancer: a randomised trial. Lancet. 2005;366:643-8 | 11. Harrington, K. D.: Anterior decompression and stabilization of the spine as a treatment for vertebral collapse and spinal cord compression from metastatic malignancy. Clin. Orthop., 233:177-197,1988. | 12. Henrik c. f. bauer, M.D., PH.D , stockholm, sweden .Posterior decompression and stabilization for spinal metastasis ; jbjs 1997 | 13. Jacob bickels, shloma dadia ,zvi lidar. Current concepts review -Surgical management of metastatic bone disease ; jbjs 2009