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Role of Surgery in Spinal Metastases

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Abstract

Spinal metastases constitute two-third of all cases of bone metastases. Surgical intervention in these tumours has been recommended in highly selective cases, for confirming diagnosis, stabilizing the spine, and decompressing nerves or spinal cord for alleviation of pain and preservation of function.In this article,the authors have reviewed available evidence on role of surgery in spinal metastases and have presented results of selected papers on this vast topic.

Keywords: Spinal metastases, microsurgery, radiation therapy, radiosurgery.

Introduction

Spinal metastases is found in about 10% of all patients suffering from malignant tumours at some point during the course of their disease, most common primary sites being prostrate, lung and breast.[1] Treatment options include excision, debulking, chemotherapy, conventional radiotherapy, stereotactic radiosurgery; and in certain cases, supportive treatment of pain management, prevention of deformity and loss of function. Minimally invasive techniques have recently been introduced but so far there is limited data supporting it.[2] For patients presenting with established or impending spinal instability, surgery plays an important role to prevent further deformity and to control pain refractory to non-operative treatment options. The objective of this review is to discuss the role of surgery in spinal metastasis, other than for the establishment of diagnosis. Although there is substantial literature available, for the purpose of brevity, we have mentioned only a few key articles.

Review of Evidence

Sundaresan et al., in their retrospective review of management of patients with solitary spinal metastases from solid tumours concluded that these patients showed better potential for long-term survival; and in selective cases, total surgical removal prior to radiation improved possibility of cure, as well as long-term palliation. Patients who received radiation prior to surgery had remarkably higher rates of surgical morbidity and local recurrences.[3] Patchell et al.[4] in a landmark randomized trial, reported longer median survival and better quality of life (ambulation and continence) for patients with metastatic epidural masses, after surgical decompression with radiation therapy, compared to radiation therapy alone. In another prospective study on patients undergoing

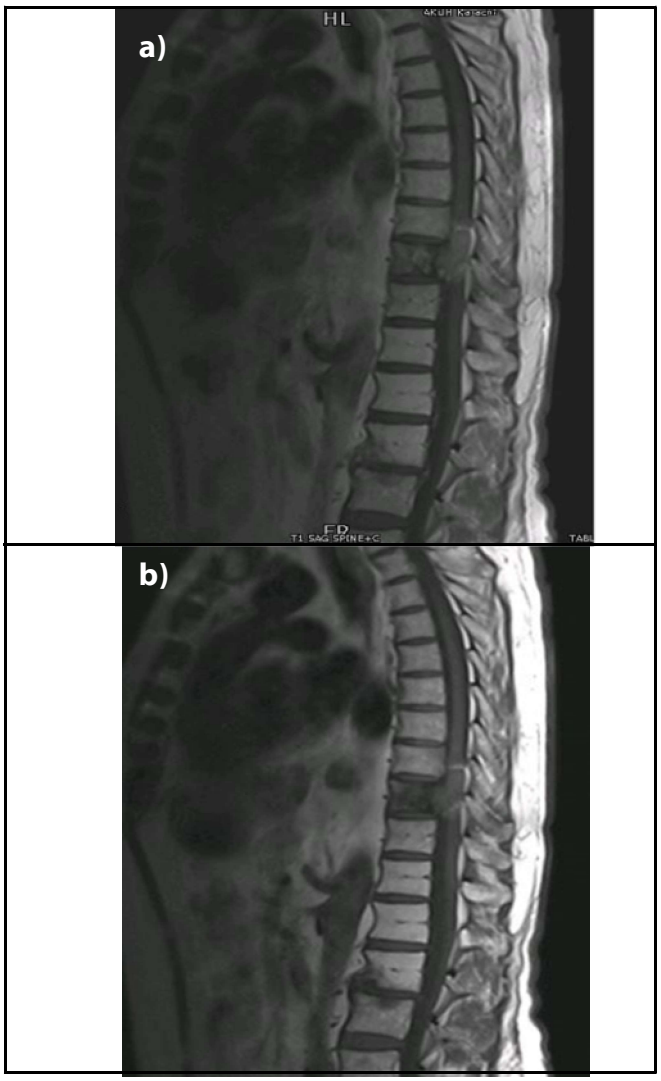

Image (a,b): MRI TIWI mid sagittal cuts, with and without contrast of a 60 year old male patient, with spinal metastases involving T10 vertebral body, secondary to sarcoma of left femur. The lesion shows typical features of vertebral body involvement sparing the disc spaces, and a significant epidural component compressing the cord.

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spinal surgery for symptomatic spinal metastases, Quan et al.[5] concluded that surgery lead to immediate and marked improvement in both pain and quality of life. Laufer et al.[6] in an analysis of patients who underwent surgical decompression and adjuvant stereotactic radiosurgery (SRS) suffering from metastatic epidural spinal cord compression also concluded that surgery with SRS resulted in longer local tumour control rate. Choi et al.[7] in a large prospective cohort, reported improvement in pain, quality of life and ambulation in patients with epidural spinal metastases who underwent surgery, even though they observed significant postoperative systemic complications, largely attributed to their disseminated disease process. Xinghuo Wu et al.[8] also concluded that surgery for symptomatic cervical spine metastases, including tumour resection and stabilization, resulted in remission of pain in 93.3% of the patients as well as marked improvement in pre-operative myelopathy in majority. Pessina et al.[9] in an article published in 2018, also concluded that surgery with radiotherapy in patients with metastatic epidural spinal cord compression from breast cancer results in limited morbidity and recommended that surgical intervention in selective cases, should be offered early in the disease. Hohenberger et al.[10] in another paper published in 2018, also concluded that tumour removal and mass reduction results in improvement in both motor and sensory deficits, as well as pain remission, in patients with space-occupying spinal metastases.

With the recent trend towards 'minimally invasive spine surgery'(MISS) for most spine procedures, it is understandable that it is also considered for surgery for spinal metastases. In one of the first direct comparisons, Miscusi et al.[11] compared MISS with open surgery on patients with acute myelopathy due to vertebral thoracic metastases in a study limited by small sample size (23 patients in MISS group and 19 patients who underwent laminectomy and stabilization with standard open surgery). It was argued that MISS should be considered as first choice of treatment as blood loss and recovery time was markedly less and need for post-operative opioids was significantly reduced, although neurological outcome and complications had no significant difference. A more recent meta-analysis by Lu VM et al.[12] also reported reduced hospital stay and blood loss, and improved post-operative function and pain in MISS compared to open surgery, also showing better complication rates in MISS (14%) than open surgery (27%).

Conclusion

For selected patients with spinal metastases, surgical resection or debulking, with or without stabilization is a viable option as it improves quality of life (sensory and motor function, pain control, continence) and may also improve life expectancy. Even radiotherapy, when indicated, has shown better outcomes, when combined with surgical resection (with or without stabilization) compared to radiotherapy alone. Patient selection remains the most important aspect of management and the authors strongly recommend multi-disciplinary team meetings for collaborative approach for all such cases.

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