EDITORIAL

The Current Role of Surgery in Metastatic Spine Disease: A New Era

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The study by Lee et al. is a large retrospective study of 577 patients with spinal metastases treated in South Korea from 2005 to 2010.¹ The authors attempted to identify certain key epidemiological and survival variables between the conservatively and surgically treated groups.

The spinal metastases predominantly included lung, liver, and breast/colorectal cancers. The inclusion criteria for surgery included patients with neurological compromise due to tumor and/or intractable pain. Patients with poor general health (as determined subjectively by the physicians), patients with incidental spinal metastases without neurological compromise, and patients who refused surgery were allocated to the conservative treatment group. They identify female gender, use of adjuvant therapy postoperatively (chemotherapy and/or radiotherapy), and postoperative survival as important positive prognostic factors in the surgery group, while presence of preoperative neurological symptoms, significant systemic disease, and particular tumor histology were classified as prognostic of poor outcome in the conservatively treated group.

As Lee et al. discuss, spinal metastatic disease is often considered the terminal stage of that primary cancer, and for many years, palliative therapy has often been the treatment of choice. However, this article sheds a positive light on the role of surgery in truly treating metastatic disease aggressively, as opposed to merely providing palliation. Lee et al. show a clear increase in mean survival in the surgically treated group after the time of diagnosis by approximately 13 months ($p < 0.009$). Also, as demonstrated in other studies, the authors point out the role of specific neurological compromise and/or acute spinal

instability due to tumor burden as an important variable in offering that patient a possible surgical treatment that would likely increase quality of life and survival.² Patchell et al. performed the only randomized control trial in 2005 looking at 101 patients with metastatic spine disease. They demonstrated that patients younger than 65 had significantly improved ambulation, continence, and survival after surgical treatment followed by adjuvant radiotherapy compared to radiotherapy alone. They also point out that a particular subtype of tumor—breast cancer—had better survival compared to other tumor types.²

Another significant advancement for spinal metastatic disease is the use of radiotherapy with or without surgery. Over the last few years, there have been a few landmark studies describing the benefit and cost effectiveness of surgery plus radiotherapy versus radiotherapy alone.³ Gerszten et al. authored a landmark study describing the use of radiosurgery, even in the setting of prior fractionated radiotherapy, as providing a stronger symptomatic response and local control independent of histology.⁴ Additionally, they state that conventional radiotherapy is an option for adequate local control and symptomatic improvement, particularly for radiosensitive histologic tumor types.^{4,5} Choosing the appropriate first-line treatment remains controversial. Studies have demonstrated an increase in postoperative infections after spinal surgery preceded by conventional radiotherapy, with infections mostly due to the associated wound breakdown.^{6,7} This problem remains unanswered with the use of stereotactic radiosurgery before surgical treatment.

As physicians and surgeons taking care of patients with metastatic spine disease, we must ask ourselves a number of questions before treatment. First, what is the current performance score and general health of the patient? Second, what role do we as surgeons have that may improve this patient's quality of life and life expectancy, while diminishing neurological compromise or pain during that

particular time? Third, what is the current preoperative histology and stage of disease, and what is the precise structural stability of the spinal column? Each of these factors, as demonstrated by Lee et al., are critical in determining treatment planning and surgical success rate.

Lee et al. also point out another factor that has been an instrumental breakthrough in chordoma and chondrosarcoma surgery over the last few decades. The role of en-bloc resection without violation of the tumor capsule in symptomatic patients with spinal chordomas has enhanced survival of patients to over 50 % at 5 years compared to the dismal survival in years past.⁸ Although classically not recommended, is there a role for en-bloc resection in metastatic spine disease? Traditionally, en-bloc resection would be attempted in patients with predominantly focal and potentially curable disease, with intralesional surgery in patients with widely systemic disease. In this study, Lee et al. identify significant differences for postoperative survival rates within the surgical group, with en-bloc resection resulting in a much higher rate of survival compared to debulking and palliative modalities ($p = 0.02$). Finally, the role of vertebroplasty has found a niche in the palliative treatment of metastatic spine disease, particularly multiple myeloma, by providing adequate local pain control in patients with pathological fractures.⁹

Limitations of the study include the selection bias when choosing patients for each group. The patients in the conservatively treated group were in much worse general health and were considered nonoperative candidates. These patients would shift the conservatively treated group overall survival in favor of the surgical group. Additionally, the use of radiosurgery or conventional radiotherapy in the treatment of metastatic spine disease in the patients in Korea would be important to include in the discussion.

Thus, in the current era of surgical treatment for metastatic spine disease, surgeons must be knowledgeable about the patient's general health preoperatively, neurological compromise due to tumor burden, causes of pain (instability vs. local inflammation from tumors), and tumor histology before making decisions. In addition to surgical

treatment, surgeons must be aware of the increasingly important role of radiosurgery, as well as palliative vertebroplasty, in the management of spinal metastases. These factors, as demonstrated in this study, are all crucial for selecting the appropriate patients and predicting outcome in patients with metastatic spine disease.

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