Spinal Oncology: An Innovative Field of Its Own?

In the last 25 years, we have witnessed an improvement in the treatment of patients with spine tumors and the emergence of spinal oncology as a subspecialty of spine surgery. Although the overall rates of survival in patients with spine tumors remain dependent on the nature and extent of primary disease, we have also seen a steady improvement in the quality of life for these patients. Such an improvement has been possible through the development of better spinal instrumentation techniques, minimally invasive methods (vertebral augmentation, percutaneous stabilization, radiofrequency ablation), and the emergence of conformal spinal radiosurgery as a new treatment modality. Many of these treatment options are complementary and not mutually exclusive. Laminectomy followed by external beam radiotherapy used to be the standard technique in cases of spinal cord compression, but today the emphasis is on tumor resection through a variety of approaches (transpedicular vertebrectomy, thoracotomy) with concurrent spinal stabilization — if in fact it is needed.

This issue of Cancer Control details the ways in which we have been more cognizant of the components of the problem and have recognized the importance of spinal instability, radiographic cord compression, neurological symptomatology, and the extent of disease in a multidisciplinary setting. The articles in this issue also reveal how we have minimized wound-healing complications in the postirradiation setting and addressed local control through en bloc resections for primary spine tumors.

At the start of the issue, Dr Clarke and colleagues discuss that certain rare tumors are amenable to cure if excised in an oncological en bloc fashion. Because primary spine tumors can be benign or malignant, biopsy that allows future tract removal is important in the guidance of further treatment options.

In the next article, Drs Clarke and Vrionis address surgical complications that decrease quality of life and delay adjuvant treatment in patients with spinal tumors. Avoiding complications begins with surgical planning because common complications (eg, wound infections, cerebrospinal fluid leaks) may be minimized by approach selection and muscle flaps. Late failures of instrumentation imply a lack of successful arthrodesis and will require morbid revisions.

Dr Kaloostian and others focus on surgically managing primary and metastatic spinal tumors and review available treatment options for these tumors. They emphasize a tailored approach that correlates with the degree of aggressiveness for each tumor, noting that patients expected to live longer will require a more aggressive surgical approach. Incompletely resected or unresectable lesions require radiotherapy.

In the next article, Dr Kaloostian and coauthors describe alternative options when traditional surgical treatment is not possible or is inappropriate. Understanding the nature of pain (whether it is nociceptive or neuropathic) and its intensity is important. Opioids, antidepressants, cannabinoids, bisphosphonates, and steroids are typical treatments when used in conjunction with radiotherapy and vertebral augmentation as part of palliative strategies.

Dr Filis and colleagues then address spinal neoplastic instability, describing how it differs from the traditional definition of traumatic instability. Although the topic is controversial among experts, scoring systems like the Spinal Instability Neoplastic Score may help determine whether instability is present and when surgery may be indicated.

In their article on kyphoplasty and vertebroplasty in patients with malignant vertebral fractures, Dr Papanastassiou and others explore the indications, contraindications, and supportive evidence for the use of vertebral augmentation in cancer-related fractures. Although these procedures are controversial in osteoporosis-related vertebral fractures, their role in cancer-related fractures is undisputed, as shown by results from the multicenter, randomized Cancer Patient Fracture Evaluation trial.

Pancoast (superior sulcus) tumors are described in detail by Dr Setzer and coauthors. These tumors of the lung typically involve the inferior part of the brachial plexus. In the absence of distant metastases, these tumors can be cured with surgery and radiation in approximately 50% of cases.

In the final article of this issue, Dr Moussazadeh and colleagues discuss the evolving paradigm of separation surgery for patients with radioresistant tumors. Spinal radiosurgery is effective against traditional “radioresistant” pathologies but requires a separation of several millimeters between the tumor and the spinal cord. Separation surgery accomplishes this and optimizes the safe delivery of subsequent tumoroidal radiosurgery.

Taken together, these articles detail how the treatment of spine tumors must be multimodal, multidisciplinary, and individualized to each patient. We
now have many more treatment options than during the days of conventional external beam radiotherapy and laminectomy. However, the goals remain the same — at least for metastatic tumors: We must provide timely local tumor control that maximizes quality of life so that our patients can return to systemic therapy in order to prolong life.

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