Changing paradigms for the treatment of brain metastasis

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BRAIN METASTASIS is the single most common type of intracranial tumor.⁹ Each year, the number of newly diagnosed brain lesions exceeds the total number of other intracranial tumors. In the US alone, more than 100,000 people suffer brain metastases each year. The incidence continues to increase as advances are made in the treatment of systemic cancer. Further complicating the clinical picture is the fact that many patients will present with multiple lesions and have a high chance of harboring additional tumors the longer they live.^{4-7,9}

Despite the staggering clinical problem, brain metastasis historically has been an orphan disease. Medical oncologists had little to offer, given that chemotherapy generally does not penetrate the blood-brain barrier. Typically, neurosurgeons would operate only in patients with solitary, accessible, symptomatic tumors and low perioperative risks usually indicating limited systemic disease. Radiation oncologists could perform whole-brain radiation therapy (WBRT) but had little else to offer should the disease continue to progress or new lesions develop.

In the past decade, a significant shift has occurred in the treatment paradigm of brain metastasis. The Radiation Therapy Oncology Group (RTOG) 9508 demonstrated that radiosurgery in combination with WBRT leads to an improvement in the quality of life and local tumor control in patients with one to three brain metastases.¹ In addition, RTOG 9508 revealed improved survival in patients with a solitary metastasis who receive radiosurgery plus WBRT rather than WBRT alone. Data from many other studies have shown the significant benefits of radiosurgery for brain metastasis and suggest that number of metastases is not the limiting factor in terms of a successful outcome.^{2,3,8,10} Longer survival, improved disease control, better quality of life, and improved neurocognitive function for patients with brain metastasis is becoming the norm.

With an expanding treatment armamentarium including extirpation, local chemotherapy, and radiosurgery, neurosurgeons are much more involved in the care of patients with brain metastasis. Now, large series of patients with brain metastasis are demonstrating that survival is limited not by intracranial but by extracranial disease progression. Neurosurgeons have pushed the onus of prolonging survival in patients with brain metastases back to the oncolo-

gists. The treatment of patients with brain metastasis will continue to require multimodal therapy including chemotherapy, biological agents, WBRT, resection, and radiosurgery; thus, a multidisciplinary team will be required to manage intracranial and extracranial disease aggressively. This issue of *Neurosurgical Focus* represents an overview of current treatment modalities for brain metastases, and reports are drawn from a broad range of physicians.

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