

Fall 2008

## LETTER FROM THE DIRECTOR



If you're like me, you can't drive the freeways of metro Detroit without seeing a billboard touting new radiosurgery technology.

While every manufacturer will tell you its technology is the

best, the differences between Gamma Knife®, CyberKnife®, Omnibeam, TomoTherapy, and Novalis TX® are negligible. What is more important than the equipment is that patient care decisions are made based on individual medical situations. This requires clinical experience in using the treatment technologies, and also meticulous planning to determine how the treatment can be individualized most effectively.

Henry Ford has been developing the technology of radiosurgery incorporating research of the radiation physics and the biology of tumors, as well as leading-edge clinical application. The research performed at Henry Ford has helped advance the practice of radiosurgery across the industry. We are leading a national radiosurgery clinical trial of spine metastasis in the Radiation Therapy Oncology Group, approved by the National Institutes of Health. This is just one example of our ongoing effort to advance the development of radiosurgery practices.

I am most proud of how our research translates to excellent outcomes and a better quality of life for our patients. In this newsletter, I discuss the treatment options for brain metastasis.

Thank you

Samuel Ryu, M.D.

*Director of Radiosurgery  
Josephine Ford Cancer Center  
Henry Ford Health System*

## RADIOSURGERY FOR BRAIN METASTASIS

Metastatic brain tumors are the most common type of brain tumors. The treatment of brain metastasis has evolved over time. Whole brain radiotherapy combined with steroid treatment has been the most common approach. However, the functional outcome and tumor control of brain metastasis can be improved with more individually designed treatments using surgical resection or radiosurgery.

Recent national and international study results support designing more individualized treatments using a set of prognostic indices. Important parameters used in the decision-making of brain metastasis treatment include the number and size of metastatic lesions, presence of progressive systemic tumor status, patient's performance status, rapidity and duration of neurological symptom development, as well as age and general condition. Various combinations of whole brain radiotherapy, surgery and or radiosurgery should all be considerations for the treatment of brain metastasis. There is some debate, however, about potential long-term neurological toxicity following whole brain radiation. Depending on the patient's wishes and institutional preference, the treatment approach may vary.

In the case of multiple brain metastases, whole brain radiation is considered the standard treatment. Radiation can control the metastatic tumors and even potential microscopic tumors that develop during the metastatic process.

Surgical resection is an important treatment for solitary metastatic lesions, particularly when the lesion has caused neurological deficit. Obviously, the patient should be in a condition stable enough to undergo the invasive surgery and anesthesia. Whole brain radiotherapy is administered after surgery.

Radiosurgery has shown excellent control of metastatic tumors. It

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## Treatment of Brain Metastasis

Whole  
Brain Radiotherapy



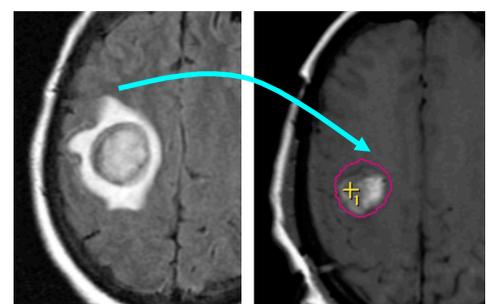
Multiple lesions

Radiosurgery



Usually 1-4 lesions  
Tumor control > 90%  
Non-invasive

Surgery+Radiosurgery



Usually 1-2 lesions  
Neurological deficit  
Tumor control > 90%

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is most commonly used in the case of one to four lesions. The advantage of radiosurgery is that it is a non-invasive treatment. It is usually combined with whole brain radiotherapy.

A contemporary treatment approach at Henry Ford Hospital is to delay the use of whole brain radiation in the case of one to four brain metastases. There are two approaches. One is surgical resection followed by radiosurgery to the resection site to minimize recurrence at the surgical site. This approach is useful when the patient has developed neurological symptoms and requires decompression of the space-occupying lesion. The second approach is radiosurgery to the focal metastatic lesions to control the local tumor deposits. (These treatment approaches are demonstrated in the accompanying figure.) Whole brain radiotherapy is not used for these cases. Radiosurgical treatment also can be used for recurrent brain metastasis when the number of lesions is limited.

We have analyzed our 10-year experience of 169 patients whose brain metastases were treated with radiosurgery, or surgical resection, or a combination of both, without whole brain radiotherapy. Tumor control was greater than 90 percent with excellent neurologic outcome. In fact, because no incision is required with radiosurgery, most patients usually resume normal activities the same day.

#### **Hot off the Press: New Guide for Spine Radiosurgery**

Samuel Ryu, M.D., has co-authored the definitive reference for clinical applications of state-of-the-art radiosurgery of the spine. "Spine Radiosurgery" (Thieme, 2008) discusses the benefits as well as the limitations of current spine radiosurgery treatments for benign and malignant spine disorders, primary and metastatic tumors, and spinal cord arteriovenous malformations. The book is available at [www.thieme.com](http://www.thieme.com).

## **OUR COMMITMENT TO YOU AND YOUR PATIENT**

*To refer a patient for stereotactic radiosurgery, please call 313-916-1027.  
Your patient will be seen within 48 hours. After the consult, a detailed report  
will be sent to you with the recommended course of treatment.*

Josephine Ford Cancer Center works in partnership with the Hermelin Brain Tumor Center

# *Advances in* **RADIOSURGERY**



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