INNOVATIONS
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Compassion, commitment
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Radiosurgery: Cost-effective, efficacious modality for treating variety of tumors

Stereotactic radiofrequency surgery to treat benign cranial tumors is more cost-effective and socially responsible than is treating them with conventional open surgery, a research team from China Medical University Hospital in Taiwan contends in the May 2006 edition of *Neurosurgery*.

The investigators reached that conclusion after comparing the socioeconomic costs of treatment with each of the two methods.

In their study, the team retrospectively analyzed the direct and indirect costs involved in 174 cases of benign cranial tumors seen in the hospital between 2000 and 2005. Ninety-four of those patients were treated using open surgery; the remaining 80 with Gamma Knife® radiosurgery.

The researchers took into account operating room, ICU, ward and outpatient services costs as well as the costs associated with treatment for postoperative complications and the patients' time lost from work.

The mean length of hospital stay for open surgery was 18.2 days; for the Gamma Knife group it was only 2.2 days. The open surgery group lost 160 days from work, but the Gamma Knife cohort lost a mere 8 days.

The Gamma Knife's edge was blunted when per-hour treatment costs were calculated, however. Those turned out to be almost triple that of open surgery, but the open surgery group experienced more than nine times as many complications.

With regard to costs for workdays lost, the Gamma Knife represented the more economical option: the sum for the open surgery group was triple that of the Gamma Knife's.

Pinpoint aim

Within the scope of neurological surgery, there are a number of conditions and cases that are inoperable or for which surgical intervention is not appropriate. For many of these cases, radiation surgery has proven effective and both safer for and easier on patients. At the same time, today's radiosurgery systems afford a level of pinpoint accuracy, flexibility and ease that makes radiosurgery the preferred treatment even for some cases where surgery remains an option.

Radiosurgery systems work by delivering a finely collimated ablative radiation beam to a targeted tumor.

The "gold standard" for intracranial radiosurgery is the Gamma Knife. A newer and more flexible radiosurgery system is the CyberKnife®, which offers the same clinically equivalent degree of accuracy as the Gamma Knife; it is used mainly for treatment of spinal tumors and lesions.

Moreover, radiosurgery is not limited to patients who are ineligible for surgery or whose tumors are inoperable. In fact, radiation surgery is very effecting at shrinking or eliminating tumors.

Patient satisfaction up

In a previous edition of our Innovations *Physician Alert*, I reported on treatment options for the condition of trigeminal neuralgia. Space limitations prevented me from mentioning that one other good intervention is radiosurgery.

The January 2005 issue of *Neurosurgery* contains a provocative article detailing a study involving 81 patients treated for medically refractory trigeminal neuralgia. The authors noted favorable outcomes for a majority of the patients and concluded that Gamma Knife surgery is an effective procedure worthy of being offered as "a first-line surgical modality for patients with trigeminal neuralgia who are unsuited or unwilling to undergo microvascular decompression."

As to specifics, 42% of the patients experienced complete pain relief following the procedure, with 31% obtaining no benefit whatsoever (27% reported partial but satisfactory pain relief). Among those who gained some or total pain relief, there was a mean decrease of 75% in the amount of pain medication they needed to take. Understandably, patients' self-reported quality-of-life ratings improved – up by 90% – and their overall satisfaction score stood at a gratifying 80%.

By the way, the incidence of trigeminal neuralgia for males in the U.S. is 4.7 cases per 100,000, compared to 7.2 per 100,000 for females. The condition affects mainly older adults, although cases involving children as young as 22 months have been reported. There is a family history of trigeminal neuralgia in approximately 5% of patients. Pain can occur on either or both the right and left side (61% of cases in one study were observed to occur on the right side only, with 4% being bilateral).

Trigeminal neuralgia is caused by mechanical compression of the face's trigeminal root. The source of this compression is usually a neighboring artery.

The condition is characterized by paroxysms of pain occurring in any or all of the trigeminal nerve's three branches. The pain can manifest as a sharp, piercing sensation. Initial attacks may last a few seconds or several minutes; they have been known to continue for up to an hour. As the condition progresses, the pain tends to become constant but dull.

Conclusions

Radiosurgery is a cost-effective, efficacious means of ablating tumor cells while sparing surrounding tissue. It is advantageous for treating patients in cases where surgery is contraindicated or in instances where the tumor is in a location inaccessible for rescission by conventional means.

The technology works by delivering a finely collimated, ablative radiation beam to the targeted tumor from hundreds of various positions.

Many patients who undergo radiosurgery for conditions such as trigeminal neuralgia report having obtained significant pain relief, with dramatically less need to take as much pain medication as in the past. These patients tend to express greater satisfaction and markedly improved quality of life following radiosurgery.

In the scope of my practice, stereotactic radiosurgery is regularly employed using both the Gamma Knife (for which I am fellowship-trained) and the CyberKnife, just as they do in many of the nation's leading universities. I have performed countless radiosurgery procedures of the spine and brain, dating back to my time in training at Mayo Clinic and the University of Pittsburgh, which makes me among the area's most qualified providers of this service.

However, that is not the only reason why more and more physicians in Milwaukee, Waukesha and neighboring Wisconsin communities are opting to refer to me their brain and spine patients for radiosurgery treatment of tumors and lesions. In addition to being responsive and accessible, it is customary for me to keep referring physicians informed of their patients' progress, beginning with a detailed report issued promptly after the initial consult and continuing with a letter following each successive visit. Referring physicians also receive from me a phone call after surgery to apprise them of the results and discuss any pertinent details. Moreover, I take the time to inform patients and answer all their questions in terms they can understand.

You, too, can refer to me with confidence for help in managing these challenging patients. When those you've referred to me later return to you for their continued care, they will recognize that right from the start you have been looking after their best interests and have had their satisfaction uppermost in mind.

For further information about my radiosurgery capabilities, as well as my other neurology surgery services, please call me at (262) 717-9850.

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