

# NEW DATA SHOWING EFFECTIVENESS OF STEREOTACTIC RADIOSURGERY FOR TREATMENT OF ACOUSTIC NEUROMAS

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Data from Radiosurgery New York and other radiosurgery centers are bringing very promising news for those afflicted with acoustic neuroma - a benign tumor of the brain's eighth nerve. Common symptoms of this tumor are hearing loss, ringing in the ear and imbalance.

These tumors can enlarge and cause significant and permanent neurologic damage - even death - if not successfully treated. While surgery has been the mainstay of therapy for many years, a new non-invasive method of treatment - stereotactic radiosurgery - has made tremendous inroads. New data continues to support its use.

A just-published retrospective study reported by Pollock et al and published in Neurosurgery in 1995 compared surgery to stereotactic radiosurgery. One hundred forty-nine patients had acoustic neuromas treated. Seventy-one patients had open surgery and 78 patients had stereotactic radiosurgery. Treatment option was determined by patient and physician.

Sixty patients were excluded because of prior surgery and 27 of those patients had tumor recurrence despite surgery. Eight patients had neurofibromatosis (a disease predisposing to acoustic neuromas) and 25 patients were excluded for arbitrary criterion of having a tumor larger than 3 centimeters. Two patients were lost to follow up.

Of 87 remaining patients evaluated, 40 patients underwent surgery and 47 patients had stereotactic radiosurgery.

The authors noted that the tumor sizes were "somewhat larger in the stereotactic radiosurgery group." It was also noted that "microsurgical resection was performed by experienced acoustic neuroma surgeons."

Stereotactic radiosurgery was administered using a Cobalt source, single fraction method with a dose of 13 to 18 Gray. Gray is a measurement of radiation. Median follow up was three years.

The patients undergoing surgery had a greater incidence of operative or delayed facial nerve dysfunction - occurring in 52% - and a greater incidence of long term post operative facial paresis (or weakness) occurring in 37% of patients. That is particularly interesting in that surgeons operated on those with smaller tumors - a group one would believe to have lesser complications if all were equal.

Furthermore, open surgery resulted in diminished "serviceable hearing." Serviceable hearing was maintained in only 3 of 21 patients undergoing open surgery compared to 6 of 8 patients undergoing stereotactic radiosurgery.

Open surgery had a higher rate of new onset post-operative headache. This occurred in 21% of patients having surgery compared to 5% treated with single fraction stereotactic radiosurgery.

Authors noted "patients resumed their normal activities sooner after stereotactic radiosurgery." This also was very markedly significant.

At time of follow up, one patient having surgery had a recurrence and one had post operative hydrocephalus (fluid build-up in the brain). Thirty eight percent of patients having surgery had

complications. These included rhinorrhea (brain fluid leaking through the nose), wound infection, brain contusion, progressive hydrocephalus, pseudomeningocele, dysphagia (difficulty swallowing), double vision or unilateral body weakness.

Nine patients or 23% having had open surgery for the acoustic neuroma underwent subsequent surgery to the eyelids in an attempt to remedy facial nerve weakness. Eight percent of surgical patients had a revision of the wound because of the leakage of the spinal fluid through the nose and one patient had removal of a blood clot on the brain post operatively.

This compares dramatically to the stereotactic radiosurgery group. Of the patients undergoing stereotactic radiosurgery, the control rate was 94%. Only 6 patients had complications including ventricular enlargement. In these 6 patients, tumor volume was 6.9 cubic centimeters - more than twice the volume of others treated. Six had a shunt placed, with four having marked improvement. No patient required additional surgery.

In discussing the outcome, the authors noted that the "goal of acoustic neuroma management is to provide the best patient outcome possible. Management strategies that maintain facial nerve function, reduce treatment associated morbidity and allow the patient to resume a normal lifestyle as quickly as possible after intervention are desirable. The results of this study show that stereotactic radiosurgery was more effective than microsurgical resection in preserving normal facial function. Hearing preservation was associated with less morbidity. Patient functional outcomes and patient satisfaction of the tumor management were greater in the stereotactic radiosurgery group, though these did not reach statistical significance due to the sample size of the present study. Patients who had radiosurgery were able to return to their pre-operative level of function sooner than patients who underwent microsurgery. Moreover hospital length of stay and total management charges were significantly less in the radiosurgery group."

The authors of this retrospective study concluded that "when compared to microsurgical resection of acoustic neuromas, stereotactic radiosurgery is an effective and less costly management strategy."

It should be noted that in data presented by the radiosurgery group at the European Brain Tumor Meetings, a control rate of 100% with no facial nerve damage was observed for acoustic neuromas using fractionated radiosurgery.

The main difference in our approach is fractionation of radiosurgery using a pinless headframe technique. By dividing the dose into four or five smaller portions (depending on tumor size), surrounding vital brain tissues such as facial nerve and brain stem are further protected from the radiation while the tumor is vigorously attacked. The high control rate and lack of facial nerve damage, makes this technique a very attractive non-invasive treatment option.

Our physicians' approach using fractionation allows treatment of tumors both smaller than - as well as greater than - 3 centimeters in diameter. Our experience treating tumors from pinpoint size up to nearly 6 centimeters in maximum diameter, has shown that fractionation maintains efficacy of treatment while minimizing or avoiding the known toxicities of open surgery or single fraction radiosurgery.

Currently, scores of patients have been treated by the physicians of Radiosurgery New York. Results remain impressive with patient requiring surgery for treatment failure. There has been no incidence of trigeminal nerve neuropathy.

Fractionation continues to have great appeal with patients around the world. In light of the beneficial outcome, the rationale of this approach is clear - avoidance of open surgery and its convalescence as well as morbidity and mortality associated with it. Fractionated stereotactic

radiosurgery will most probably be the treatment of choice in future when it is more widely available. This innovative approach is used routinely by the physicians of Radiosurgery New York.