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## ***Acoustic Neuroma Q&A***

***A Conversation with John M. Tew, MD,  
Clinical Director of The Neuroscience Institute  
And Co-chairman, Acoustic Neuroma Association Medical Advisory Board***

CINCINNATI – John M. Tew, M.D., a Mayfield Clinic neurosurgeon and Clinical Director of The Neuroscience Institute at the University of Cincinnati and University Hospital, is one of America's leading experts in the treatment of acoustic neuroma. He is currently serving his third consecutive five-year term as a member and co-chairman of the Acoustic Neuroma Association's Medical Advisory Board.

During a recent interview, Dr. Tew discussed a variety of topics related to acoustic neuromas and their treatment.

### **Question: Dr. Tew, how and why does an acoustic neuroma develop?**

**Answer:** Acoustic neuromas are tumors of the nerve sheath. These tumors can arise from the sheath of any nerve, but they are most common on the vestibular portion of the acoustic nerve. Correctly, they are called vestibular schwannomas, because they arise from the vestibular or balance component of the eighth cranial nerve. But historically they are known as acoustic tumors. Neuromas can, of course, arise from the facial nerve or any other peripheral or central nerve of the body. Commonly, acoustic neuromas arise at the area where the nerve leaves the petrous bone, near where the nerve connects to the arachnoid layer of the brain's covering. There is a transition in the nerve sheath at this location that accounts for the common site of tumor origin.

What causes these tumors? There are no known risk factors. Like all tumors, a mutation occurs that leads to the unchecked replication of the cells. The genetic cause of acoustic tumors can be inherited in a disease called neurofibromatosis, a genetic disorder of dominant inheritance that is passed down with 50 percent penetrance from parent to child. Neurofibromatosis type II leads to bilateral acoustic neuromas as well as tumors on multiple other nerves in the body and a much higher presence of meningioma, another benign tumor of the covering of the skull and spine.

### **Question: What is the latest information about cell phone usage and acoustic neuroma?**

**Answer:** Current data indicates that there is no clear-cut documentation of a link between cell phone usage and acoustic neuroma. It has been postulated that frequent, direct contact with the waves of a cell phone may produce a higher incidence of acoustic neuroma, but the more compelling issue involving cell phone usage is the danger involved in using one when you are driving a vehicle. However, if one uses a cell phone frequently, a wireless or remote receiver should be used so that the phone is not in direct

contact with the skull.

**Question: How do you decide whether surgery is appropriate?**

**Answer:** The general guidelines are based on size, the patient's age, the patient's medical condition, and the patient's opinion of which treatment is preferable. Because the tumor is benign in most cases, observing the tumor to determine its growth pattern and growth rate is appropriate. For example, it is not essential to remove a small tumor in a person who is 70 years old. In that case we would observe the tumor to determine what happens over a period of years. Small tumors also can be treated on an outpatient basis with fractionated radiation – the delivery of highly focused beams of radiation through the skull. The preservation of hearing with radiation is in excess of 60 percent, which cannot be accomplished with surgical removal. So smaller tumors with slow growth may be better treated with radiotherapy.

Tumors that are 2.5 centimeters and larger may be best treated with surgery. Removal is preferred when the tumor becomes big enough to press against the brain or threaten neurological function. But the patient must be capable of undergoing surgery, and the anesthesia risk must be acceptable. If the patient is not healthy enough to safely undergo anesthesia, radiation treatments or observation may be more appropriate.

Through research we have learned that – in some patients -- subtotal removal may be better than attempting total removal by surgery. During subtotal removal, most of the tumor is removed, and the devascularized capsule is separated from its blood supply. The facial nerve, hearing function, and all the other critical brain and nerve functions are spared. The University of Cincinnati is collaborating with Stanford University in a study to evaluate the effect of subtotal removal in patients who have tumors larger than 2.5 centimeters. Current data indicate better operative results and infrequent recurrence of tumors.

**Question: What potential complication is most worrisome during conventional surgery?**

**Answer:** The first thing is the risk to the patient from the anesthetic. It is vital that the patient have a safe anesthetic experience. The patient must be in healthy condition going into surgery for a benign tumor so that anesthetic administration does not pose a major risk. Second, most patients have only hearing loss, so we must seek to preserve all neurologic function, including hearing. If the patient has already lost some hearing or has virtually no hearing function, restoration cannot be expected. So we concentrate on preserving function of the facial nerve, which is extremely important to the patient. We discovered in our last study, when we evaluated patients from the Acoustic Neuroma Association, that facial dysfunction was the most troublesome result of surgery. The second most troublesome result was hearing loss.

**Question: At The Neuroscience Institute, is the surgical removal of an acoustic neuroma always performed by a team of specialists?**

**Answer:** Yes, a team of specialists works together before, during, and after treatment of an acoustic neuroma. The surgical team includes two otolaryngologists, two neurosurgeons, and two neurotologists. Because treatment frequently involves radiosurgery – eradication of the tumor with highly focused beams of radiation -- specialists in radiation oncology also are a part of our team. Rehabilitation specialists and physical therapists are part of the team, and on infrequent occasions when genetic issues arise, a geneticist is consulted to evaluate and advise the family and patient.

**Question: Is a team approach to acoustic neuroma surgery used at all hospitals?**

**Answer:** No, not all hospitals use a team approach. However, the Acoustic Neuroma Association strongly recommends that people seek medical attention from physicians who work together.

**Question: Does research demonstrate that a team approach leads to better outcomes?**

**Answer:** Dr. Fred Barker, Associate Professor of Neurosurgery at the Harvard Medical School and Director of the Cranial Base Center at Massachusetts General Hospital, has documented in his studies that the more experienced surgeons have better outcomes. Teamwork has also been documented to lead to better outcomes. My personal experience confirms that the art of removing an acoustic neuroma involves a definite learning curve. It takes a significant period of time to develop the microsurgical technique necessary to do it well. Getting the best results also requires having access to monitoring techniques that allow you to evaluate facial nerve, hearing, and brain function during the procedure.

**Question: So in medicine, as in music, practice makes perfect, and studies show a correlation between favorable outcomes and the number of procedures performed. How many acoustic neuroma cases are done at The Neuroscience Institute at UC and University Hospital each year?**

**Answer:** Nearly 60 cases per year. An increasing number of our patients – nearly one-third – receive radiation as their first primary treatment for acoustic neuroma. The others are observed or treated by surgery.

**Question: Do you have any specific advice for patients?**

**Answer:** Individuals who have been diagnosed with acoustic neuroma should take the time to study and evaluate their condition and consult with the Acoustic Neuroma Association. When the tumor is benign, the individual has ample time to study, to consult with teams of physicians, and to determine who has the best results and who best meets his or her needs. Patients should ask surgeons about their qualifications, the number of procedures they do, and their results. In a condition as specialized as acoustic neuroma, patients should ask about the physician's patients who have been previously treated, whether they can talk to some of these patients, whether the physician is a member of the Acoustic Neuroma Association, and whether the physician encourages participation in the association. I advise every patient to seek the very best treatment and education available.