

The Tampa Bay Hearing and Balance Center

Harbourside Medical Tower 4 Columbia Drive Suite 610 Tampa, FL 33606

813 844 HEAR 813 844 4900 Fax 813 844 4905

Loren J Bartels, MD, FACS



Glomus Jugulare, Glomus Tympanicum, other Skull Base Tumor

What is glomus jugulare, glomus tympanicum, or other skull based tumor?

Glomus tumors are benign and may arise in the middle ear, mastoid, or skull base area called the *jugular foramen*. Pulsing noise in the ear and hearing loss are of the earliest symptoms. Glomus tumors may affect hearing, balance, facial muscle function, swallowing, tongue movement, shoulder movement, and other nerve functions. As the tumor grows, it compresses and may invade the swallowing nerve, the voice nerve, the facial nerve, and other nerves. The tumor may fill the middle ear, portions of the mastoid, extend deeper into the skull base and commonly extend into the upper neck. Some grow into the brain cavity causing brain compression and stumbling with coordination difficulty. With larger tumors, facial paralysis, and pain may also develop. Glomus jugulare commonly invades and compresses the large vein that drains the brain cavity, the jugular vein. Large glomus tumors may also surround and invade the main artery to the brain, the internal carotid artery. Glomus tympanicum/mastoideum tumors are smaller but may fill and invade the middle ear, Eustachian tube, and mastoid quite extensively or may be quite limited. Almost all glomus tumors are benign but a small percentage secrete hormones that can cause severe high blood pressure and even dangerous heart rhythm disturbances. A variety of other skull base tumors are included in this section because symptoms and risk issues are similar.

Purpose of Surgery:

Removal of tumors from the skull base may be accomplished in several ways. Three common approaches are used. The simplest is through the ear canal for tiny glomus tympanicum tumors. For larger glomus tympanicum/mastoideum tumors, an incision behind the ear allows tumor removal from the mastoid and extended areas of the middle ear and Eustachian tube. For glomus jugulare tumors, a transsigmoid approach is most common. In the transsigmoid approach, the surgeon removes the tumor along the course of the skull base pathway of the jugular vein, deep to the facial nerve and below the middle ear. More extensive highly specialized approaches may sometimes be employed for tumors that have extended more deeply into the skull base and adjacent areas of the brain cavity or skull base. In some cases, tumor removal from the brain covering or from inside the brain cavity may enter spinal fluid spaces. The common goal of all of the surgical approaches is to remove the tumor while preserving as much normal or near normal nerve function as possible.

Alternatives to Tumor Removal:

Some tumors in the skull base may not grow or may grow only very slowly. For these, observation rather than surgery may be a reasonable choice. Radiotherapy, also called *radiosurgery*, may stop the tumor from continuing to grow but does not remove the tumor and typically does not change tumor size. Some skull base tumors may not be appropriate for radiotherapy. Damage to the bone of the ear canal, *osteoradionecrosis*, may be a delayed complication of radiotherapy and may necessitate later surgical correction that would close the ear canal and cause a severe hearing loss in the radiated ear.

General Considerations:

In some glomus tumor/jugular foramen approaches, abdominal fat is used to fill the defect created by the surgical approach. The fat plug prevents spinal fluid from leaking out of the ear. In some cases, the incision extends into the lateral-mid neck. The large muscle on the side of the neck, the sternomastoid muscle, may be moved or lose nerve supply causing it to become smaller. In larger tumor cases, the facial nerve may need to be mobilized which may result in temporary facial paralysis. In unusual cases, a portion of the facial nerve may need to be removed and replaced by a nerve graft because of tumor invasion. In these cases, the facial nerve recovers function in almost all cases, but frequently not back to perfect. Some facial weakness may be permanent. In such cases, specialized eye care may be necessary. Feel free to ask the surgeon to demonstrate the surgery pathway on a plastic skull.

For medium to large tumors, a radiologist may perform an **arteriogram with embolization** in order to plug up the blood supply of the tumor. Plugging up the blood vessels inside the tumor decreases blood loss with tumor removal and improves the surgeon's ability to work around the tumor.

Before Surgery: Avoid aspirin, Advil, Motrin, Aleve, Celebrex, Vioxx, or similar non-steroidal anti-inflammatory medication for at least five days and preferably two weeks before surgery. Ask the doctor if any other medications will need to be changed before surgery.

After surgery, restrictions include: Do not use aspirin, Advil, Motrin, Aleve, Celebrex, Vioxx, or similar non-steroidal anti-inflammatory medication for two weeks after surgery. These and other **arthritis medications may cause bleeding.**

No nose blowing for a minimum of two (2) weeks. Open mouth to **sneeze** for two (2) weeks. Do not stop a sneeze by squeezing your nose. You may wash the incision with soap and water and coat it with antibiotic ointment.

Resuming normal activities:

Some patients are **dizzy** and have some **headaches** for a while after surgery. **Tiredness** commonly follows major surgery. Resume **driving** and **return to work** when dizziness and/or lightheadedness have improved sufficiently and if your job activity fits within lifting restrictions, listed below. Dizziness after surgery usually improves more rapidly the more active you are. Avoid ladders, step stools, and unprotected heights until you can move quickly in any direction without dizziness or lightheadedness. The more quickly you work back into normal routines, the more quickly you will feel better and energy will return.

Avoid lifting more than 10 pounds for two weeks after surgery. Then, you may resume normal lifting the activity unless the doctor has indicated a reason to continue to avoid lifting

General Risks of Glomus Jugulare, Glomus Tympanicum, other Skull Base Tumor removal:

Numbness in the scalp above and around the ear is common and may improve in a couple of years. **Dizziness** is common after surgery and usually improves within a few weeks. More persistent dizziness bothers some patients permanently. **ringing** in the ear is sometimes a noticeable nuisance after surgery, but may also be improved by surgery. Further **hearing impairment** in the operated ear is common even when the surgeon attempts to save it because the middle ear and Eustachian tube may not function properly even after tumor removal. **In the some skull base approaches**, the residual hearing is sacrificed as part of the surgery. A **hearing aid** may not be an option on the operated side, but sometimes, a hearing aid that routes the hearing to the residual hearing ear may be possible. **Taste** for sweet, sour, salt, and bitter on the side to front of the tongue may be altered by surgery and may not recover back to normal, but symptoms usually settle down within six months. Ability to smell is not affected by ear surgery. **Infection** called meningitis may develop after surgery with a general risk of less than 1% of our tumor surgery experience. *If you think you have an infection, with wound swelling wound drainage, or fever, call the doctor right away.* **Spinal fluid may**

leak through the wound or through the mastoid bone into the nose. If spinal fluid leakage persists, the surgeon may elect to place a spinal fluid drain into the lower back for a few days. If the drain does not solve the problem, more surgery may be necessary to stop the spinal fluid leakage. Spinal fluid leakage may predispose to infection and other serious problems. **Weakness** or **paralysis** of the nerve that makes the face to smile can be a side effect of tumor surgery. A delayed onset facial paralysis can develop after leaving the hospital. The face recovers to normal or nearly normal in most cases, but, in some, facial movement may be permanently impaired. In some cases, the facial nerve may need to be repaired or replaced either at the time of the tumor surgery or on a delayed basis in a separate operation. In the event of facial nerve weakness or paralysis, **special eye precautions** will be necessary and more surgery to protect the eye may become necessary. **Other common problems** after medium to large tumor removal include trouble swallowing, weakness of the voice and shoulder because of surgical removal of tumor from these nerves. Walking and/or coordination problems may occur if the tumor must be removed from the brain-cerebellum. Stroke, excessive bleeding and blood collection inside the head, and death are possible but unlikely. Blood transfusions are not usually needed, but would pose transfusion related risks (see the hospital blood transfusion informed consent document for more details). When an **arteriogram with embolization** is necessary, potential, uncommon side effects may include facial weakness, stroke, and other nerve problems. Anesthesia has its own risks that the anesthesia doctor will discuss with you. **General medical conditions** that affect the heart, circulation, breathing, and urination can all be aggravated by surgery of any kind. Men who have bladders and prostate glands sensitive to certain medications may need bladder catheterization after surgery of any kind.

Patient/Guardian Statement: The patient or patient's guardian and/or legal representative state by signing below that doctor has discussed the surgery, alternatives, and major risks, that the above information has been communicated to the patient, guardian, and/or legal representative and that an opportunity to ask questions has been given. The consent form should not be signed until the patient, guardian, and/or legal representative have obtained a layman's understanding of the surgery and have obtained satisfactory answers to all questions. By signing the consent form, the patient, guardian, and/or legal representative indicate a layman's understanding of the surgery, potential alternatives to surgery, and reasons for surgery and indicate a desire to proceed. If the surgery has been explained in another language, the person who has translated must indicate by cosigning the document that all information from the doctor and from this consent form have been communicated to the patient, guardian, and/or legal representative and that all questions have been answered satisfactorily.

Patient printed name			Patient/guardian signature		Date Signed
Circle Ear to be operated	R	L	Doctor: Loren J Bartels MD FACS	Date of Surgery	
Witness			Guardian printed name		Translator Language