

The Tampa Bay Hearing and Balance Center

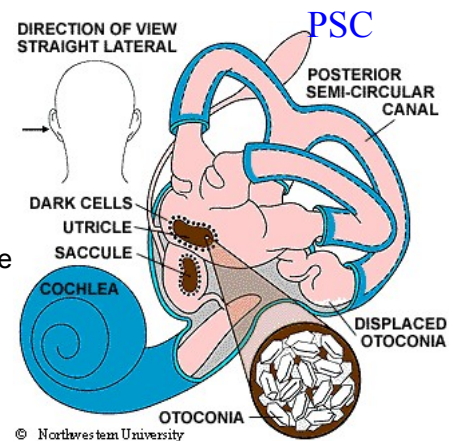
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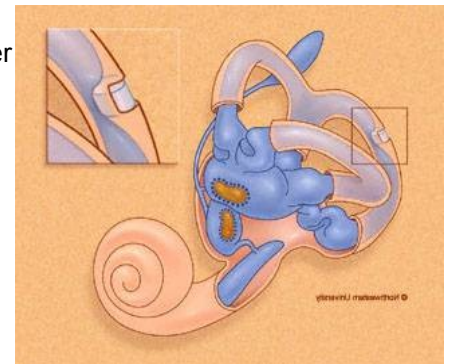
Fenestration Posterior Semicircular Canal for BPPV

Why does a person have surgery called *Fenestration of the Posterior Semicircular Canal*?

The inner ear has both hearing and balance function. The back part of the inner ear has two kinds of motion detectors: linear and rotational movement detectors. The semicircular canals detect rotational movement. During rotation, the inner ear fluid shifts slightly in the semicircular canals against microscopic pressure sensors. Normally, the amount of sensor shift or deflection is a highly accurate reflection of the pace of any rotational movement. Also in the inner ear are linear movement detectors, the utricle and the saccule. The utricle has a sensory surface shaped like a gravy boat which is covered by a stimulating membrane system that has very fine calcium containing crystals called *otoconia* [see **OTOCONIA** in figure at right]. Linear movement causes this sensory membrane system to shift. The crystals in the membrane system stimulate the underlying sensory surface in a manner that gives an accurate analysis of linear movement. A variety of problems can cause these crystals to loosen. Once loose, these crystals may float in the inner ear fluids. When a person is still while lying down, the floating crystals may enter in the adjacent semicircular canals, especially in the back-bottom semicircular canal called the *posterior semicircular canal (PSC)*-see diagram at side). When still, the crystals gradually settle into a clump. [see **DISPLACED OTOCONIA** in figure at right] Activity usually disperses them. If the crystals become trapped in the PSC as a clump, certain kinds of movement, such as tipping the head back, lying down, rolling over, bending over, and other movements causes the clump to shift. The shifting clump causes an abnormal PSC fluid pressure change that over stimulates the PSC sensor. That over stimulation causes vertigo, sometimes with nausea, and vomiting and a period of imbalance. This symptom pattern is called *benign paroxysmal positioning vertigo*.



The cause of loose crystals can be any of several things: viral infection affecting the inner ear, head trauma, whiplash, severe febrile illness, and aging or other degenerative change. When crystals which are trapped in the PSC shift during these movements, they cause a transient excessive fluid pressure wave that over stimulates the lower balance canal sensor. The resulting vertigo typically lasts seconds to minutes, sometimes with nausea and other symptoms. When just a few crystals exist, they normally dissolve slowly and go away spontaneously over a period of days to weeks. In most persons, a maneuver called the *canalith repositioning procedure (CRP)* moves the loose crystals out of this canal resolving the problem. In rare persons, the CRP does not provide lasting relief. Then, trapping the loose crystals surgically is done by opening (fenestration) of the posterior semicircular canal in order to plug it [see plug in canal in figure at right]. The surgical procedure opens the balance organ by going in behind the ear. Using a special wax, the surgeon fills the posterior semicircular canal which disables this canal and traps the crystals.



Since the CRP almost always helps, surgery is rarely necessary and one can usually learn to live with this problem.

Purpose of Surgery:

By trapping the crystals (otoconia), the inner ear pressure shift that occurs during rotational movements is prevented and that stops the vertigo in almost all persons.

Alternatives to surgery:

The *Canalith Repositioning Surgery* mentioned above almost always fixes benign paroxysmal positioning vertigo. Be sure that you have submitted to or personally done the CRP many times without lasting relief before you elect to have surgery. Note as well, that in rare persons, what looks like BPPV really comes not from the inner ear but from the brain.

Risk of not having surgery:

Statistics show that when BPPV has persisted for months, it is likely to last indefinitely.

General Considerations:

The surgery is normally performed as an outpatient, almost always under general anesthesia. Depending on health status, some laboratory testing may be necessary. Laboratory testing is usually completed within a week prior to surgery. Prior to surgery, both the surgeon and the anesthesiologist review your medical history and pertinent medical examinations. Usually, a hearing test (audiogram) and extensive balance tests are completed shortly before surgery.

Before Surgery:

Avoid aspirin, Advil, Motrin, Aleve, Celebrex, Vioxx, or similar non-steroidal anti-inflammatory medication for at least five days 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.**

After surgery, **the head dressing may be removed on the second post operative day.** A **cotton plug** in the ear opening will be found when the dressing is removed. Please **remove the cotton plug on the second day after surgery.**

Do not get water in the operated ear. Use petroleum jelly (Vaseline) coated cotton to plug the ear for bathing until the doctor tells you the ear is ready for water exposure.

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 behind the ear** with soap and water and coat it with antibiotic ointment for about 5 days. **No lifting, pushing, pulling, bending, stooping,** or getting out of an easy chair/recliner for two (2) weeks after surgery (the effort to get out of the recliner may cause the inner ear to leak). **When getting out of bed,** roll so that you can use your hands to push up rather than stomach muscles to pull up when getting out of a lying-down position.

Resuming normal activities:

Some patients are **dizzy** for a while after 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.

Between two (2) and six (6) weeks after surgery, do not lift over **10 pounds** unless otherwise instructed. Gentle, normal walking is encouraged right away, as dizziness allows. Fast walking may resume at 2 weeks after surgery. Avoid jogging till 6 weeks postop. From **6 weeks to 3 months postop, do not lift over 30 pounds.** After three months, you may resume lifting and exercising according to what is safe for you unless the doctor has indicated a reason to continue to avoid lifting.

General Risks of Fenestration of the Posterior Semicircular Canal:

BPPV Positioning vertigo resolves with surgery, unless the problem is really only from the operated ear. Imbalance with rotational movement may persist for several weeks and rarely does not resolve. Some **numbness** of the back and top of the ear commonly resolves within two to six months after surgery. **Swelling** of the outer ear should be minimal. Most swelling typically resolves in a few days to a week or so. Because of swelling and surgical changes, a pre-existing hearing aid may not fit for a few weeks after surgery. Wait at least two to four months after ear surgery to get a new hearing aid or **ear mold fitting.** **Infection** after surgery is a rare possibility. Things that make infection more likely are getting water in the ear, nose blowing, and getting a cold or flu. If you think you have an infection, call the doctor right away. Eardrum membrane perforation is a rare possible side effect of surgery and may require an operation to repair. After ear surgery, **taste** for sweet, sour, salt, and bitter flavors may be abnormal on the same side of the tongue as the surgery. The taste nerve comes from the nerve that makes the face to smile and is sometimes adjacent to the area of the posterior semicircular canal occlusion (plugging). In the vast majority of patients, the taste complaints resolve or become tolerable. Ability to smell is not affected by ear surgery.

Mild **dizziness** is common after surgery and usually improves within a few days to a few weeks. Persistent dizziness that is bothersome is rare unless both balance organs have been damaged prior to the surgery. **ringing** in the ear is sometimes a noticeable nuisance after surgery. **Hearing** may be blocked for 2-6 weeks and **loud noise may be annoying.** Further **hearing impairment** in the operated ear may occur with a low risk rate. If such occurs, the ear may not benefit from a hearing aid. A rare side effect of ear surgery is deafness in the operated ear. **Weakness or paralysis** of the nerve that makes the face to smile is an extremely rare side effect of ear surgery. A delayed-onset facial paralysis can develop after leaving the hospital, generally occurring if a person has a fever blister history - **please let the doctor know if you have had fever blisters or mouth sores.** The face recovers to normal or nearly normal in almost all cases, but, in some, facial movement may be permanently impaired. In extremely rare cases, facial paralysis may require additional surgery. In the event of facial nerve weakness or paralysis, **special eye precautions** will be necessary. **Other rare problems** after ear surgery include excessive bleeding, spinal fluid leakage, meningitis, or other serious problems which are extremely unlikely.

General medical conditions that affect the heart, circulation, breathing, and urination can all be aggravated by surgery of any kind. Men 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 Surgery ear	R	L	Doctor: Loren J Bartels MD FACS		Date of Surgery	
Witness		Guardian printed name		Translator		Language