



## Perforated Eardrum

Insight into ear injuries

- What is a perforated eardrum?
- What causes eardrum perforation?
- How is hearing affected by a perforated eardrum?
- and more...

A hole or rupture in the eardrum, a thin membrane that separates the ear canal and the middle ear, is called a perforated eardrum. The medical term for eardrum is tympanic membrane. The middle ear is connected to the nose by the eustachian tube, which equalizes pressure in the middle ear.

A perforated eardrum is often accompanied by decreased hearing and occasional discharge. Pain is usually not persistent.

### *What causes eardrum perforation?*

The causes of a perforated eardrum are usually from trauma or infection. A perforated eardrum from trauma can occur:

- If the ear is struck directly
- With a skull fracture
- After a sudden explosion
- If an object (such as a bobby pin, Q-tip, or stick) is pushed too far into the ear canal
- As a result of acid or hot slag (from welding) entering the ear canal

Middle ear infections may cause pain, hearing loss, and spontaneous rupture (tear) of the eardrum, resulting in a perforation. In this circumstance, there may be infected or bloody drainage from the ear. In medical terms, this is called otitis media with perforation. Symptoms of acute otitis media include a sense of fullness in the ear, diminished hearing, pain, and fever.

On rare occasions a small hole may remain in the eardrum after a previously placed pressure-equalizing (PE) tube falls out or is removed by the physician.

Most eardrum perforations heal on their own within weeks of rupture, although some may take several months to heal. During the healing process the ear must be protected from water and trauma. Eardrum perforations that do not heal on their own may require surgery.

### ***How is hearing affected by a perforated eardrum?***

Usually the size of the perforation determines the level of hearing loss - a larger hole will cause greater hearing loss than a smaller hole. The location of the perforation also affects the degree of hearing loss. If severe trauma (e.g., skull fracture) dislocates the bones in the middle ear which transmit sound, or injures the inner ear structures, hearing loss may be severe.

If the perforated eardrum is caused by a sudden traumatic or explosive event, the loss of hearing can be great and tinnitus (ringing in the ear) may be severe. In this case, hearing usually returns partially, and the ringing diminishes in a few days. Chronic infection as a result of the perforation can cause persistent or progressive hearing loss.

### ***How is a perforated eardrum treated?***

Before attempting any correction of the perforation, a hearing test should be performed. The benefits of closing a perforation include prevention of water entering the ear while showering, bathing, or swimming (which could cause ear infection), improved hearing, and diminished tinnitus. It also may prevent the development of cholesteatoma (skin cyst in the middle ear), which can cause chronic infection and destruction of ear structures.

If the perforation is very small, an otolaryngologist may choose to observe the perforation over time to see if it will close spontaneously. He or she might try to patch a patient's eardrum in the office. Working with a microscope, your doctor may touch the edges of the eardrum with a chemical to stimulate growth and then place a thin paper patch on the eardrum. Usually with closure of the tympanic membrane, hearing is improved. Several applications of a patch (up to three or four) may be required before the perforation closes completely. If your physician feels that a paper patch will not provide prompt or adequate closure of the hole in the eardrum, or if paper patching does not help, surgery may be required.

There are a variety of surgical techniques, but most involve grafting skin tissue across the perforation to allow healing. The name of this procedure is called tympanoplasty. Surgery is typically quite successful in repairing the perforation, restoring or improving hearing, and is often done on an outpatient basis.

Your doctor will advise you regarding the proper management of a perforated eardrum.