

Ear Cysts (Cholesteatoma and Preauricular Cyst)

An abnormal skin growth or fluid pocket in or near the ear that can erode nearby bone.

THE STORY IN ONE SENTENCE

An abnormal skin growth or fluid pocket in or near the ear that can erode nearby bone.

“Skin in the wrong place grows and traps debris, silently eating away bone and putting hearing and balance at risk.”

Normal anatomy — the body's job

The ear is built in three parts: the outer ear (the part you see and the ear canal), the middle ear (an air-filled space behind the eardrum that holds three tiny bones—hammer, anvil, and stirrup—which pass sound vibrations along), and the inner ear (a fluid-filled snail-shell called the cochlea that turns vibrations into nerve signals, plus balance loops that tell your brain which way is up). The eardrum is a thin sheet of tissue that seals the ear canal from the middle ear; it vibrates when sound waves hit it. The middle ear is normally lined with a thin, moist layer of cells that make a tiny bit of mucus and are connected to the back of the throat by a tube (the Eustachian tube) so air pressure stays equal on both sides of the eardrum. The skin of the outer ear canal and the outer layer of the eardrum naturally shed dead cells, which fall out of the ear on their own. Just in front of the ear, the skin of the face forms during development as separate pieces that zip together; when that zip is complete, there are no tunnels or pockets left behind.

BODY'S JOB

The outer ear funnels sound waves down the canal to the eardrum. The eardrum vibrates and passes those vibrations through the three tiny bones of the middle ear, which amplify the sound and deliver it to the cochlea. The cochlea turns the mechanical vibrations into electrical signals that travel up the hearing nerve to the brain, letting you hear. The balance loops nearby sense head movement so you can walk, turn, and keep your eyes steady. The Eustachian tube keeps air pressure balanced so the eardrum can vibrate freely, and the lining of the middle ear stays healthy by draining any mucus or fluid down into the throat.

1. Sound waves enter the outer ear and travel down the ear canal.
2. Waves hit the eardrum and make it vibrate.
3. Vibrations pass through the hammer, anvil, and stirrup bones in the middle ear, getting louder.
4. The stirrup pushes on the window of the cochlea in the inner ear.
5. Fluid inside the cochlea ripples, bending tiny hair cells that fire nerve signals.
6. Signals travel up the hearing nerve to the brain, and you recognize the sound.
7. Dead skin from the ear canal and outer eardrum naturally falls out toward the opening of the ear.
8. Air flows in and out through the Eustachian tube, keeping pressure equal and the middle ear dry.

What breaks

In a cholesteatoma, skin ends up growing in the middle ear—a place where skin should never be. That skin behaves just like normal skin: it grows, sheds, and piles up dead cells. But because it's trapped behind the eardrum or in the mastoid bone (the honeycomb bone behind the ear), the dead skin can't fall out. The buildup gets infected by bacteria, and both the bacteria and the body's own enzymes (chemicals released to fight infection) start dissolving the bone around them—first the tiny hearing bones, then the bone protecting the inner ear, the facial nerve (which moves your face), and even the covering of the brain. In a preauricular cyst, a tiny tunnel of skin that should have disappeared before birth stayed behind in front of the ear. That tunnel sheds skin cells into itself, and if bacteria get in (often from the skin surface), the pocket fills with pus and swells into a painful, red lump.

CLINICAL TERM

Cholesteatoma: keratinizing squamous epithelium in the middle ear or mastoid with accumulation of keratin debris, chronic inflammation, and osteolytic enzyme activity leading to bone erosion. Preauricular cyst: epithelial-lined sinus tract anterior to the ascending helix, often communicating with the skin surface, prone to infection and abscess formation.

How the body compensates

The body cannot repair or remove a cholesteatoma or preauricular cyst on its own. There is no natural cleanup process that stops skin from growing in the wrong place or that clears trapped debris from a closed space. The immune system tries to fight infection inside a cholesteatoma or infected cyst by sending white blood cells and releasing enzymes, but those same enzymes damage surrounding bone and tissue, making the problem worse instead of better. Because the skin keeps growing and the space keeps filling, the only effective treatment is surgery to remove the abnormal skin and clean out the affected area. Without surgery, the cyst or cholesteatoma will continue to expand, erode bone, and cause complications.

1. {'what': 'The immune system sends white blood cells to fight bacteria inside the cholesteatoma or infected cyst.', 'why': 'Infection triggers inflammation, and the body tries to kill bacteria and clear debris—but in a closed pocket, this actually increases pressure and enzyme release.', 'cost': 'Enzymes meant to digest bacteria also dissolve bone, worsening erosion of the hearing bones, facial nerve canal, and skull base.'}
2. {'what': 'Drainage may occur if a preauricular cyst or cholesteatoma ruptures to the outside through the skin or into the ear canal.', 'why': 'The pressure inside the pocket becomes so high that it breaks through the thinnest barrier, releasing pus and debris.', 'cost': 'Drainage gives temporary relief but does not remove the cyst lining or stop skin growth, so the problem comes back; repeated rupture and scarring make future surgery harder.'}
3. {'what': 'Hearing loss forces the person to turn up volume or rely more on the other ear.', 'why': 'As the cholesteatoma destroys the tiny bones that carry sound, vibrations no longer reach the inner ear effectively.', 'cost': 'Conductive hearing loss becomes permanent if bone is lost; the person may need a hearing aid or reconstructive surgery after the cholesteatoma is removed.'}
4. {'what': 'The body walls off an infected preauricular cyst with scar tissue, forming an abscess.', 'why': 'Scar tissue tries to contain the infection and protect nearby healthy tissue.', 'cost': 'The abscess must be drained, and the scar makes complete surgical removal of the cyst more difficult, increasing the chance the cyst will come back.'}

Domino effect

1. Skin grows in the middle ear (cholesteatoma) or a preauricular tunnel traps dead skin cells (preauricular cyst). — Whether from a retracted eardrum pocket, congenital skin island, or incomplete facial fusion, skin is now in a space where it cannot shed outward, so debris accumulates.
2. Dead skin and earwax pile up inside the pocket, creating a warm, moist environment perfect for bacteria to grow. — Bacteria from the nose, throat, or skin surface colonize the debris, leading to chronic infection and a foul-smelling discharge.
3. Bacterial infection triggers the immune system to release enzymes and inflammatory chemicals that dissolve surrounding bone. — The body's attempt to fight infection backfires—enzymes meant to break down bacteria also eat away at the delicate bones of the middle ear, the mastoid, and the skull base.
4. The cholesteatoma expands, eroding the tiny hearing bones (hammer, anvil, stirrup), causing conductive hearing loss. — Without intact bones to pass vibrations from the eardrum to the cochlea, sound cannot reach the inner ear effectively, and hearing fades in that ear.
5. The cyst or cholesteatoma may break into the inner ear, the facial nerve canal, or even through the bone covering the brain. — Unchecked growth and bone erosion eventually reach critical structures—fluid leaks from the inner ear (causing severe dizziness), the facial nerve is exposed (risking facial paralysis), or infection spreads to the brain lining (meningitis) or brain itself (abscess).
6. A preauricular cyst that gets infected forms a red, swollen, painful lump in front of the ear that may drain pus through the skin opening. — Bacteria multiply inside the cyst, pressure builds, and the body tries to expel the infection; the cyst may rupture outward or require surgical drainage.
7. Even after drainage or antibiotics, the cyst or cholesteatoma comes back unless the entire skin lining is surgically removed. — As long as the abnormal skin remains, it will keep growing, shedding, and trapping debris—so the cycle of infection and expansion repeats.
8. Surgery removes the cholesteatoma or cyst lining, stops bone erosion, and may require reconstruction of the eardrum or hearing bones to restore hearing. — Only by taking out the skin and cleaning the space can the disease be stopped; damaged structures may need grafts or prosthetic bones to work again, and close follow-up ensures no residual or recurrent disease.

Symptoms · what the patient feels, and why

- **Foul-smelling ear drainage:** The cyst (cholesteatoma) is a pocket of old skin cells that traps dead tissue and debris. As this debris builds up and breaks down, bacteria grow in it, creating a strong, bad-smelling discharge that leaks from the ear.
- **Hearing loss in one ear:** The growing cyst pushes against and can damage the tiny ear bones (ossicles) that vibrate to send sound to the brain. When these bones can't move freely or are partially destroyed, sound doesn't travel well, so hearing becomes muffled or quiet.
- **Feeling of fullness or pressure in the ear:** The cyst takes up space in the middle ear (the air-filled chamber behind the eardrum), and as it grows it presses on the eardrum and surrounding structures, creating a sensation like something is plugging the ear.
- **Ear pain or aching:** The expanding cyst stretches and presses on the delicate lining of the middle ear and mastoid (the honeycomb bone behind the ear), irritating nerve endings and triggering pain, especially if infection is also present.
- **Small pit or opening in front of the ear (preauricular cyst):** During development in the womb, the ear forms from several pieces of tissue folding together. If these pieces don't seal perfectly, a tiny tunnel (sinus tract) is left behind, appearing as a small dimple or hole in the skin just in front of the ear cartilage. This tunnel can fill with skin cells and become a cyst.
- **Swelling or lump in front of or behind the ear:** Skin cells and debris collect inside the cyst, forming a soft or firm lump under the skin. If the cyst gets infected, white blood cells flood the area to fight bacteria, causing even more swelling, redness, and warmth.
- **Dizziness or problems with balance:** The inner ear contains fluid-filled loops (semicircular canals) that sense movement and help you balance. A cholesteatoma growing nearby can erode through bone and damage these canals or irritate them with inflammation, confusing the brain's sense of position and causing spinning sensations (vertigo) or unsteadiness.
- **Weakness of the face on one side:** The facial nerve runs through a narrow bony tunnel inside the ear. If a cholesteatoma erodes into this tunnel, it can squeeze or damage the nerve, preventing signals from reaching the muscles of the face, so one side droops or cannot move normally.

Focused exam

- **White, pearly mass behind the eardrum (tympanic membrane) that looks like a shiny ball or skin buildup:** This is the classic sign of cholesteatoma — abnormal skin growth in the middle ear that keeps piling up and can destroy the tiny ear bones and skull bone if it keeps growing. It tells you surgery will likely be needed to remove it before it causes permanent damage.

- Foul-smelling drainage (like old cheese or rotten smell) coming from the ear canal: Cholesteatoma traps dead skin cells that bacteria love to feed on, creating infection with a very specific bad smell. This smell is different from regular ear infection drainage and strongly suggests cholesteatoma rather than simple otitis media.
- Small pit or dimple with a tiny opening just in front of the ear (near where the ear attaches to the face), sometimes with hair or cheesy material coming out: This is a preauricular cyst (also called preauricular sinus) — a tube of skin that formed before birth and opens to the surface. If it gets red, swollen, or drains pus, it means infection has set in and needs antibiotics, and later surgery to remove the whole tract so it does not keep getting infected.
- Hearing loss on one side (the person cannot hear a whisper or finger rub next to that ear as well as the other side): Cholesteatoma erodes (eats away) the three tiny bones that carry sound vibrations across the middle ear. This causes conductive hearing loss (sound cannot get through) and tells you the cholesteatoma has already damaged important structures and needs removal soon.
- Weakness of one side of the face (the person cannot close one eye tightly, smile evenly, or wrinkle one side of the forehead): The facial nerve runs through a bony tunnel right next to the middle ear. If cholesteatoma has grown enough to press on or erode into that tunnel, it paralyzes the face muscles on that side. This is an urgent complication that requires surgery within days to save the nerve.
- Spinning dizziness (vertigo) or severe imbalance, especially if it started suddenly: The balance organs (semicircular canals and labyrinth) sit in the inner ear, just next door to the middle ear. Cholesteatoma can erode through the bone wall and damage or infect the inner ear, causing a spinning sensation (vertigo). This is a red flag that the infection or growth is breaking into deeper, more dangerous areas.

Diagnostics · every test answers a question

- Otoscopy (looking into the ear canal with a lighted scope) and pneumatic otoscopy (gently puffing air to see if the eardrum moves) → Is there a white pearly mass visible behind or on the eardrum, and does the eardrum move normally when air is puffed? This shows whether cholesteatoma is present and whether the middle ear space is filled with abnormal tissue.
- High-resolution CT scan of the temporal bones (the skull bones that hold the ear structures), with thin cuts (1 mm slices) and no contrast dye → Has the cholesteatoma eroded (eaten away) any of the three tiny hearing bones (ossicles), the bony wall over the facial nerve, the roof of the middle ear (tegmen), or the wall to the inner ear (otic capsule)? This map guides the surgeon and flags dangerous erosions.

- Audiometry (formal hearing test in a soundproof booth with headphones, measuring air conduction and bone conduction at different pitches) → How much hearing has been lost, and is the loss conductive (middle ear problem blocking sound waves) or sensorineural (inner ear or nerve damage)? This tells you if the cholesteatoma has only damaged the bones or has also hurt the inner ear.
- MRI of the temporal bones with diffusion-weighted imaging (DWI) sequences → Is there residual or recurrent cholesteatoma after prior ear surgery, especially in hidden pockets where the surgeon cannot see with a regular scope? MRI can spot tiny cholesteatoma that CT misses because skin debris shows bright white on DWI images.
- Culture of ear drainage (swab the fluid coming out of the ear and grow bacteria in the lab) → Which bacteria are causing the infection in the cholesteatoma or preauricular cyst, and which antibiotics will kill them? Cholesteatoma infections often grow unusual bacteria (*Pseudomonas*, *Proteus*, anaerobes) that need specific antibiotics.
- Ultrasound of the preauricular area (using sound waves to make a picture of the lump near the ear) → Is the lump in front of the ear a simple fluid-filled cyst, or is there a deeper sinus tract (tube of skin) tunneling toward the ear canal or middle ear? This helps plan surgery and avoid incomplete removal.

Treatment logic

- Surgical removal of cholesteatoma (mastoidectomy and tympanoplasty) — the surgeon opens the mastoid bone, removes all the abnormal skin and infected tissue, and rebuilds the eardrum and hearing bones if they are damaged → Removes the destructive growth before it erodes more bone, prevents life-threatening complications (meningitis, brain abscess, facial paralysis), stops the foul-smelling drainage, and may improve hearing if the ossicles can be rebuilt. This is the only way to truly get rid of cholesteatoma; it will not go away on its own or with medicines.
- Topical antibiotic ear drops (ciprofloxacin or ofloxacin drops) for infected cholesteatoma with drainage → Reduces the number of bacteria in the ear canal and middle ear, decreases the amount of smelly drainage, and lowers inflammation before surgery. This makes the surgery safer by reducing the infection load, but the drops do NOT shrink or remove the cholesteatoma itself.
- Oral antibiotics (amoxicillin-clavulanate, cephalexin, or clindamycin) for infected preauricular cyst with redness and swelling → Kills the bacteria causing the infection (usually *Staphylococcus aureus* or *Streptococcus* species), shrinks the swelling, stops the pain, and drains the pus. The infection clears in 7-10 days, but the cyst tract remains under the skin.

- Incision and drainage of an abscess (if the preauricular cyst has formed a large pocket of pus) — the doctor cuts open the swollen area, drains the pus, and packs the wound → Immediately relieves the pressure and pain, removes the pus so antibiotics can work better, and prevents the infection from spreading to the surrounding face and neck tissues. The wound heals over a few weeks.
- Surgical excision of the preauricular sinus tract (the surgeon removes the entire tube of skin from the surface down to where it ends, often near the cartilage of the ear) — done electively when there is no active infection → Permanently removes the abnormal tract so it cannot fill with debris and get infected again. Cures the problem and prevents repeated cycles of infection, antibiotics, and drainage. Success rate is high (over 90%) when done by an experienced surgeon during a quiet period (no infection).
- Hearing aids or bone-anchored hearing devices (if the cholesteatoma has caused permanent hearing loss that surgery cannot restore) → Amplifies sound and improves the person's ability to hear speech and environmental sounds, improving quality of life and communication. Bone-anchored devices vibrate the skull bone directly, bypassing the damaged middle ear entirely.

Red flags

- Facial droop or weakness on one side of the face
- Severe headache, stiff neck, or confusion (signs that infection may have spread to the brain or its coverings)
- Sudden severe dizziness or spinning sensation that doesn't go away
- High fever with ear pain or drainage (suggests infection is spreading beyond the ear)

Nursing priorities

1. Keep the ear dry and teach the patient not to get water in it (no swimming, use a cotton ball with petroleum jelly when showering) — Water can carry bacteria into the cyst or infected area, making the infection worse. Keeping it dry helps the body fight the infection and prevents new bacteria from getting in.
2. Watch closely for signs of spreading infection: fever, severe headache, stiff neck, confusion, or increasing face weakness, and report these immediately — Ear cysts sit close to the brain and the facial nerve. If infection spreads to the bone (mastoiditis) or the covering of the brain (meningitis), it becomes life-threatening. Early detection saves lives and prevents permanent damage.

3. Give prescribed antibiotics on time and teach the patient to finish the entire course, even if they feel better — Antibiotics kill the bacteria causing infection. Stopping early lets some bacteria survive and grow back stronger, leading to a worse infection that is harder to treat.
4. Prepare the patient and family for possible surgery, explaining that removing the cyst is often the only way to stop it from growing back and damaging the ear permanently — Cholesteatomas do not go away on their own; they keep growing and destroying bone and tissue. Surgery removes the entire cyst so it cannot come back. Preauricular cysts that get infected repeatedly also need removal to prevent future infections.
5. Assess and document hearing changes, balance problems, and any ear drainage (amount, color, smell), and report worsening to the provider — These signs show whether the cyst is damaging the hearing bones, balance system, or causing active infection. Tracking changes helps the provider decide how urgent surgery is and whether stronger treatment is needed now.

Sources

- American Academy of Otolaryngology-Head and Neck Surgery (AAO-HNS)
- UpToDate
- BMJ Best Practice
- Cochrane

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