CONDITION

Mastoiditis

Mastoiditis is an infection of the skull bone behind the ear, usually caused by a middle ear infection.

WHAT IT IS
Infection and inflammation of the mastoid bone

BODY SYSTEM
Ear and nearby skull bone

MAIN SYMPTOMS
Ear pain, fever, swelling behind ear, ear sticking out

WHAT CAUSES IT
Infection spreading from the middle ear

HOW IT IS DIAGNOSED
Clinical ear examination, with CT when needed

MAIN TREATMENT
Hospital antibiotics, ear drainage, sometimes surgery

CAN IT BE CURED?
Yes - prompt treatment usually clears infection

IS IT AN EMERGENCY?
Yes - suspected mastoiditis needs urgent hospital assessment

LONG-TERM OUTLOOK
Recovery is usual with timely treatment

Overview

Mastoiditis is an infection and inflammation of the mastoid bone. This is the part of the skull that you can feel just behind your ear. It contains many small, air-filled spaces connected to the middle ear.

Most cases develop when a middle ear infection spreads into these spaces. The infection can cause pus, swelling, and damage to the thin walls between them. Mastoiditis can affect children or adults, although its symptoms may be harder to recognise in very young children.

Mastoiditis needs urgent medical assessment. Treatment usually involves antibiotics like amoxicillin or doxycycline in hospital. Some people also need a procedure to drain infected fluid or remove infected bone.

Prompt treatment is important because the mastoid is close to the inner ear, facial nerve, large blood vessels, and brain. Complications are not inevitable, and most people recover when the infection is recognised and treated.

Symptoms

Symptoms often begin during a middle ear infection or appear after the ear infection seemed to be improving. They usually affect one ear.

Possible symptoms include:

A young child may pull at the ear, cry more than usual, feed poorly, or be difficult to settle. These signs have many possible causes, but swelling behind the ear or a change in the ear's position needs urgent assessment.

Long-lasting mastoid inflammation can sometimes cause repeated ear discharge and hearing problems without a high fever. This may occur alongside chronic middle ear disease or a cholesteatoma, which is a collection of skin cells growing in the wrong place inside the ear.

- Pain, redness, tenderness, or swelling behind the ear
- The affected ear being pushed outward or downward
- Ear pain or a feeling of pressure
- Fever
- Fluid or pus coming from the ear
- Reduced or muffled hearing
- Headache
- Tiredness or irritability

Causes and risk factors

Mastoiditis is usually caused by bacteria spreading from the middle ear. The middle ear is the air-filled space behind the eardrum. Because it connects with the mastoid air cells, an infection can move from one area to the other.

Many middle ear infections settle without causing mastoiditis. It is not possible to predict with certainty which infection will spread.

Factors linked with a higher risk include:

Mastoiditis itself is not usually passed from one person to another. However, a virus that led to the original middle ear infection may be contagious.

Rarely, infection may reach the mastoid through another route, such as after injury or surgery. The bacteria responsible can differ according to age, previous treatment, and whether the ear problem is acute or long-lasting.

- A middle ear infection that is severe, persistent, or not improving
- Repeated middle ear infections
- A damaged or perforated eardrum
- Chronic ear discharge
- Cholesteatoma
- A weakened immune system
- Previous ear or mastoid surgery

Diagnosis

A healthcare professional will ask about your symptoms, recent ear infections, antibiotic treatment, ear discharge, and previous ear problems. They will examine the ear and the skin behind it.

An otoscope, which is a small lighted instrument, is used to look at the ear canal and eardrum. The examination may show a bulging or damaged eardrum, pus, or changes linked with a middle ear infection.

Blood tests may be used to look for inflammation and help assess how unwell you are. A sample of blood or ear discharge may be sent to a laboratory to identify the bacteria. These tests can help guide antibiotic treatment, but treatment may begin before results are available.

A CT scan may be needed if the diagnosis is uncertain, symptoms are severe, treatment is not working, or a complication is suspected. CT uses X-rays to show the mastoid air cells, nearby bone, and any collection of pus. An MRI scan may be used when doctors need a closer view of the brain, its coverings, blood vessels, or other soft tissues.

An ear, nose, and throat specialist usually helps assess suspected mastoiditis.

Treatment and management

Suspected acute mastoiditis is usually treated in hospital. Treatment aims to clear the

infection, drain trapped fluid, relieve pressure, and prevent spread to nearby structures.

Antibiotics are commonly given into a vein at first. The antibiotic chosen depends on factors such as the likely bacteria, local resistance patterns, allergies, previous antibiotics, test results, and whether complications are present. Treatment may later change to an antibiotic taken by mouth once there is clear improvement.

The specialist may recommend a procedure to drain the middle ear. A small opening can be made in the eardrum, known as a myringotomy. A tiny ventilation tube may be placed through the opening to allow infected fluid to drain and to improve airflow.

Surgery may be needed if there is an abscess, damaged bone, a cholesteatoma, a complication, or no adequate improvement with antibiotics and drainage. A mastoidectomy removes infected mastoid air cells and unhealthy tissue. The amount of surgery depends on the extent and cause of the infection.

Pain relief, fluids, and treatment for fever may also be provided. If ear discharge is present, follow the care team's advice about keeping the ear dry and cleaning only the outer ear. Do not insert cotton buds or other objects into the ear canal.

Complete the prescribed course of treatment, even if you feel better earlier, unless the treating team changes the plan.

Complications

Mastoiditis can damage structures in and around the ear. Complications are less likely when treatment starts promptly, but they can still occur.

Possible complications include:

These complications can cause symptoms such as severe or worsening headache, neck stiffness, confusion, unusual sleepiness, seizures, facial weakness, or problems with balance. They require emergency care.

- A collection of pus behind the ear or deeper in the neck
- Temporary or permanent hearing loss
- Dizziness or balance problems
- Weakness of the facial muscles on the affected side
- Infection of the inner ear
- Meningitis, which is infection around the brain and spinal cord

- A brain abscess
- A blood clot in a large vein inside the skull
- Sepsis, a serious body-wide response to infection

Prevention

Mastoiditis cannot always be prevented. It can develop even when a middle ear infection has been recognised and managed appropriately.

If you or your child has an ear infection, seek further medical advice if symptoms are worsening, not improving as expected, or returning after treatment. Take prescribed antibiotics exactly as directed, and do not use leftover antibiotics from a previous illness.

Keeping routine vaccinations up to date may reduce some infections that can lead to middle ear infections. This does not remove the risk of mastoiditis.

Avoid exposing children to tobacco smoke, which is linked with a higher risk of middle ear problems. Long-term ear discharge, repeated infections, or known cholesteatoma should be followed by the recommended ear specialist service.

Living with it and what to expect

Many people begin to improve after antibiotics and drainage, but recovery time is not the same for everyone. It is influenced by how far the infection has spread, whether surgery was needed, and whether there was an underlying ear condition.

Ear pain, fever, and swelling should improve with effective treatment. Hearing may remain muffled for a while because fluid and inflammation can take longer to clear. Your care team may arrange a hearing test after recovery, particularly if hearing remains reduced or the infection was severe.

After a mastoidectomy, you may have a dressing over the ear and temporary soreness, drainage, or altered hearing. Follow the surgical team's instructions about wound care, bathing, physical activity, and keeping water out of the ear. Follow-up visits allow the specialist to check healing and remove any packing or dressings safely.

Most people return to their usual activities after recovery. Some need longer-term ear care because of repeated infections, persistent hearing loss, or cholesteatoma. These problems may require hearing checks, ear cleaning by a specialist, or further surgery.

Mastoiditis can recur, although treatment of the infection and any underlying ear problem

lowers that risk. New pain, discharge, swelling, or hearing changes should be assessed rather than assumed to be part of the previous infection.

When to get medical help

Seek urgent same-day medical assessment if you or your child has redness, pain, tenderness, or swelling behind an ear, especially if the ear is being pushed outward. This is particularly important when there is fever, ear discharge, worsening ear pain, or a recent middle ear infection.

Go to an emergency department or call emergency services if there is:

During treatment, tell the hospital team promptly if pain, fever, swelling, headache, hearing, or alertness worsens.

Routine follow-up is still important after the urgent infection has settled. Arrange the recommended review for wound checks, hearing tests, or monitoring of chronic ear disease. Seek a non-emergency appointment if ear discharge, reduced hearing, or discomfort continues or returns.

- A seizure, fainting, confusion, or difficulty waking
- A severe headache with neck stiffness
- New facial weakness or weakness in an arm or leg
- Loss of balance with marked illness
- Repeated vomiting with severe headache
- Difficulty breathing or rapidly worsening illness

Common questions

Can mastoiditis go away on its own?

It should not be left to settle without medical care. Infection inside the mastoid bone can spread, and symptoms may worsen even after a middle ear infection seems to improve. Suspected mastoiditis needs urgent assessment and usually requires antibiotics.

Is mastoiditis contagious?

Mastoiditis itself is not generally contagious. A cold or other respiratory infection that came before the ear infection may spread between people.

Can adults get mastoiditis?

Yes. It can affect people of any age. Adults may develop ear pain, discharge, fever, hearing loss, or swelling behind the ear. A history of chronic ear disease or cholesteatoma may also be relevant.

Will I need surgery for mastoiditis?

Not everyone needs a mastoidectomy. Some infections respond to antibiotics and drainage of the middle ear. Surgery is more likely when there is an abscess, damaged bone, cholesteatoma, a complication, or inadequate improvement with initial treatment.

Can mastoiditis cause permanent hearing loss?

It can, but hearing reduction may also be temporary and caused by fluid or swelling. The risk depends on which parts of the ear were affected and whether complications occurred. A hearing test can check recovery.

Can mastoiditis come back?

It can recur, especially if there is repeated middle ear infection, chronic ear discharge, or cholesteatoma. Follow-up helps identify and manage these underlying problems.

Sources

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