CONDITION

Malignant otitis externa

Malignant otitis externa is a serious ear canal infection that spreads into nearby bone.

WHAT IT IS
Severe ear canal infection involving nearby skull bone

BODY SYSTEM
Ear and skull base

MAIN SYMPTOMS
Deep ear pain, discharge, hearing loss, canal swelling

WHAT CAUSES IT
Bacterial infection, usually Pseudomonas

HOW IT IS DIAGNOSED
Ear examination, cultures, biopsy, and CT or MRI

MAIN TREATMENT
Prolonged antibiotics and specialist ear care

CAN IT BE CURED?
Yes - with prolonged antibiotic treatment

IS IT AN EMERGENCY?
Sometimes - new facial weakness or neurological symptoms

LONG-TERM OUTLOOK
Often good with early treatment; relapse can occur

Overview

Malignant otitis externa is a serious infection that begins in the external ear canal. It can spread into the bone at the base of the skull, causing a type of bone infection called osteomyelitis.

The word "malignant" can be confusing. This condition is not cancer. The name refers to how aggressively the infection can spread if it is not treated. It is also called necrotising otitis externa in medical literature.

This condition is different from ordinary otitis externa, often called swimmer's ear. An uncomplicated outer-ear infection stays within the skin of the ear canal and usually responds to ear drops. Malignant otitis externa extends into deeper tissues and bone, so it requires systemic antibiotics. These medicines travel through the bloodstream and may be given by mouth or into a vein.

Malignant otitis externa mainly affects older adults with diabetes. It can also develop in people whose immune system is weakened by illness or treatment. It occasionally occurs in people without these risk factors.

Early assessment matters because the infection lies close to several nerves, major blood vessels, and the brain. Treatment is often successful, but it usually continues for weeks and requires regular follow-up.

Symptoms

The most typical symptom is severe, deep pain in one ear. The pain may feel stronger than expected from the appearance of the ear canal. It is often worse at night and may interfere with sleep.

Other symptoms can include:

A clinician may see fragile, inflamed tissue in the ear canal. This is called granulation tissue. It can bleed when touched, but its presence does not confirm the condition by itself.

Fever may be absent, even when the infection is serious. This means that a normal temperature does not rule it out.

If the infection reaches nerves at the skull base, it can cause facial weakness, double vision, a hoarse voice, difficulty swallowing, or weakness of the shoulder or tongue. These are urgent warning signs.

- Fluid or pus draining from the ear
- Swelling or redness within the ear canal
- Reduced or muffled hearing
- Pain when the outer ear or nearby area is touched
- A blocked or full feeling in the ear
- Headache or pain spreading toward the jaw or side of the head

Causes and risk factors

Malignant otitis externa is usually caused by bacteria entering damaged skin in the ear canal. Pseudomonas aeruginosa is the most common cause, although other bacteria and, less often, fungi may be responsible.

Diabetes is the main risk factor. High blood glucose can weaken the body's response to

infection and affect blood flow through small vessels. The condition is especially associated with diabetes that is not well controlled, but it can occur even when a person's recent readings have seemed acceptable.

Other factors that may increase the risk include:

Scratching the ear canal, using cotton buds, or inserting other objects can damage its protective skin. Ear irrigation may also cause injury in some people. These actions do not usually cause malignant otitis externa on their own, but they may provide an entry point for infection in someone at higher risk.

- Medicines or conditions that suppress the immune system
- Cancer treatment or an organ transplant
- HIV with significant immune suppression
- Older age
- Previous radiotherapy near the ear
- Repeated injury to the ear canal
- An ongoing or poorly responding outer-ear infection

Diagnosis

There is no single test that confirms every case. Diagnosis is based on the pattern of symptoms, an ear examination, laboratory findings, microbiology results, and imaging.

A clinician will examine the ear canal and eardrum. They may also check facial movement, eye movements, swallowing, speech, shoulder strength, and other functions controlled by nerves near the skull base.

A sample of ear discharge or inflamed tissue may be sent to a laboratory. This helps identify the organism and shows which antimicrobial medicines are likely to work. A tissue sample, called a biopsy, may sometimes be needed. A biopsy can help distinguish infection from ear canal cancer or another condition with a similar appearance.

Blood tests may include markers of inflammation, such as C-reactive protein or the erythrocyte sedimentation rate. These tests cannot confirm the diagnosis by themselves, but changes over time can help show whether treatment is working. Blood glucose and kidney function may also be checked.

A CT scan can show erosion or infection in bone. MRI gives more detail about soft tissues, nerves, and possible spread within the skull. Nuclear medicine or PET scans are used in some

centres, especially when the extent or activity of infection remains uncertain.

Imaging changes can take longer to settle than pain and inflammation. For this reason, a scan may still look abnormal after treatment has started working.

Treatment and management

Malignant otitis externa needs prompt treatment led by an ear, nose, and throat specialist. An infectious diseases or microbiology specialist may also help choose and adjust antimicrobial treatment.

The main treatment is a prolonged course of antibiotics like amoxicillin or doxycycline that can reach infected bone. Initial treatment commonly covers Pseudomonas , but laboratory results may lead to a different choice. Antibiotics may be given into a vein, by mouth, or in sequence. The route and length of treatment depend on the infection's extent, the organism, other health conditions, and the response to treatment.

Ear drops may also be used to manage infection within the canal, but drops alone do not treat infection that has spread into bone.

The ear canal may need careful cleaning to remove discharge and allow examination. This should be done by trained healthcare staff. Trying to clean a painful or infected ear at home can cause more damage.

Managing diabetes is an important part of treatment. Illness can raise blood glucose, even when it is usually stable. Diabetes medicines may need review while the infection is being treated.

Surgery is not routinely used to remove large areas of bone. It may be needed to obtain a biopsy, drain a collection of pus, or remove a limited amount of dead tissue. Hyperbaric oxygen therapy is sometimes considered as an additional treatment in difficult cases, but evidence for its benefit is limited.

Some people can be treated mainly as outpatients. Others need admission to hospital, particularly if they are very unwell, have nerve symptoms, cannot take oral medicine, or need antibiotics through a vein.

Complications

Without effective treatment, the infection can spread through the skull base. This can damage the nerves that control facial movement, eye movement, swallowing, speech, and shoulder

strength.

Possible complications include:

Serious complications are not inevitable. Early recognition, appropriate antibiotics, and close follow-up reduce the risk.

- Skull-base osteomyelitis
- Facial weakness or paralysis
- Difficulty swallowing or protecting the airway
- Hearing problems
- Infection or blood clots involving nearby blood vessels
- Infection of tissues around the brain
- Sepsis, the body's dangerous response to infection
- Recurrence after treatment has finished

Prevention

Malignant otitis externa cannot always be prevented. There is no vaccine, and some people develop it despite sensible ear care and diabetes management.

If you have diabetes or a weakened immune system, protecting the ear canal may reduce avoidable injury. Do not put cotton buds, fingers, or other objects into the canal. Follow professional advice about hearing-aid hygiene and keeping an actively infected ear dry.

Seek medical advice for persistent ear pain or discharge, particularly if an outer-ear infection is worsening or not responding to treatment. Prompt treatment of a routine infection may help stop deeper spread, although it cannot prevent every case.

Keeping blood glucose within the range agreed with your diabetes team supports the immune system and healing. This lowers risk but does not provide complete protection.

Living with it and what to expect

Treatment usually lasts much longer than treatment for ordinary swimmer's ear. Improvement in pain and discharge may begin before scans return to normal. Your care team may use symptoms, ear examinations, blood inflammation markers, cultures, and selected imaging to decide when treatment can stop.

Regular appointments are important even when the ear feels better. Ending antibiotics too soon can allow infection in the bone to remain active. At the same time, unnecessarily prolonged antibiotics can cause side effects and encourage resistant bacteria, so treatment is reviewed rather than continued automatically.

Antibiotic side effects depend on the medicine used. Report new rash, severe diarrhoea, tendon pain, unusual numbness, changes in heart rhythm, or other unexpected symptoms to the team managing your treatment. Do not stop prescribed treatment without medical advice unless emergency care is needed for a serious reaction.

Pain, sleep, and hearing often improve as swelling and infection settle. Hearing loss caused by blockage of the canal may be temporary. Nerve weakness can take longer to recover and may not always resolve fully.

Relapse can occur after apparent recovery. New ear pain or discharge should therefore be assessed, especially during the months after treatment. Follow-up may continue after antibiotics have ended.

Many people return to their usual activities after successful treatment. The time needed is influenced by the extent of infection, diabetes control, immune function, nerve involvement, and how quickly the infection responds.

When to get medical help

Arrange same-day medical assessment if you have severe or persistent ear pain and any of the following:

If you are already receiving treatment, contact your care team promptly if pain or discharge returns, symptoms are not improving as expected, or you cannot take your antibiotics.

Seek emergency medical help for:

These symptoms can indicate involvement of nearby nerves, blood vessels, or tissues within the skull. They need immediate assessment.

- Diabetes or a weakened immune system
- Ongoing discharge from the ear
- Pain that is especially intense at night
- Symptoms worsening despite prescribed ear treatment
- A previous history of malignant otitis externa
- New facial drooping or weakness

- Double vision or difficulty moving an eye
- New trouble swallowing, speaking, or breathing
- Confusion, fainting, or unusual drowsiness
- A severe or rapidly worsening headache
- Severe illness with shaking, breathlessness, or very low alertness

Common questions

Is malignant otitis externa cancer?

No. "Malignant" is an older term describing the infection's ability to spread into nearby bone. It does not mean that cancer is present. A biopsy may still be needed because ear canal cancer can sometimes cause similar symptoms.

Is it the same as swimmer's ear?

No. Both begin in the outer ear canal, but swimmer's ear usually affects only the canal skin. Malignant otitis externa spreads into deeper tissue and skull bone. It needs systemic antibiotics and specialist follow-up.

Can malignant otitis externa be cured?

Yes, treatment is often successful. Recovery usually requires prolonged antibiotics, management of contributing health conditions, and monitoring for relapse. Nerve damage or extensive infection can make recovery more difficult.

How long does treatment take?

Treatment usually continues for several weeks and sometimes longer. There is no single duration that is right for everyone. Symptoms, examination findings, blood tests, cultures, imaging, and medication tolerance all influence the plan.

Is malignant otitis externa contagious?

It is not usually spread from person to person. The bacteria involved are common in the environment and cause this condition when they enter vulnerable ear tissue. Normal household contact does not generally place others at risk.

Can malignant otitis externa be life-threatening?

It can become life-threatening if infection spreads to nerves, blood vessels, or tissues around the brain. Prompt diagnosis and effective treatment substantially improve the outlook. New neurological symptoms require emergency assessment.

Sources

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