CONDITION

Swimming pool granuloma

Swimming pool granuloma is a slow-growing skin infection caused by bacteria found in fresh or salt water.

WHAT IT IS
Slow-growing skin infection caused by Mycobacterium marinum

BODY SYSTEM
Skin and sometimes deeper hand tissues

MAIN SYMPTOMS
Red-purple bumps, sores, swelling, tenderness

WHAT CAUSES IT
Waterborne infection entering through broken skin

HOW IT IS DIAGNOSED
Skin biopsy and mycobacterial culture, sometimes molecular testing

MAIN TREATMENT
Prolonged antibiotics; surgery for some deep infections

CAN IT BE CURED?
Yes - antibiotics usually clear it

IS IT AN EMERGENCY?
Sometimes - spreading infection or loss of hand function

LONG-TERM OUTLOOK
Usually good, but deep infection needs longer treatment

Overview

Swimming pool granuloma is a skin infection caused by Mycobacterium marinum . This bacterium lives in fresh and salt water, especially in aquariums, fish tanks, ponds, and areas where fish are handled. Properly maintained chlorinated pools are now an uncommon source.

The bacterium usually enters through a small break in the skin. This may be a cut, puncture, scrape, cracked skin, or injury so minor that you do not remember it. The hands and arms are affected most often because they are commonly exposed while cleaning tanks or handling fish.

The infection grows slowly and prefers cooler parts of the body. It usually stays in the skin, but it can spread along lymph vessels or enter tendons, joints, and bones. These deeper infections are less common but may be harder to treat.

A granuloma is an organised collection of immune cells that forms around persistent infection or inflammation. It is not a type of cancer. Although M. marinum belongs to the wider mycobacteria family, it does not cause tuberculosis.

Swimming pool granuloma is usually curable. Recognising the water exposure matters because ordinary skin infection tests and short courses of common antibiotics like amoxicillin or doxycycline may not identify or clear it.

Symptoms

Symptoms usually begin several weeks after the bacterium enters the skin. Sometimes they appear sooner or only after a few months.

The first sign is often a small, firm bump on an exposed area, such as a finger, hand, wrist, forearm, elbow, knee, or foot. The bump may be red, purple, or skin-coloured. It often enlarges slowly.

Possible symptoms include:

The infection may not be very painful, and fever is uncommon when it remains limited to the skin. This can make it easy to mistake for an insect bite, wart, fungal infection, eczema, or another bacterial infection.

A line of new nodules can form when the infection spreads through lymph vessels, which carry fluid through the tissues. This pattern is sometimes called sporotrichoid spread because it resembles the pattern caused by another infection called sporotrichosis.

Pain with finger or wrist movement, marked stiffness, or swelling around a joint can suggest infection below the skin. Tendon sheath infection may cause swelling and difficulty bending or straightening a finger.

- One or more persistent bumps or raised plaques
- A crusted area or shallow open sore
- Mild tenderness, itching, or swelling
- Fluid or pus draining from the skin
- New bumps appearing in a line up an arm or leg
- Reduced movement, stiffness, or deeper pain near a joint

Causes and risk factors

Swimming pool granuloma develops when M. marinum in contaminated water enters damaged skin. It is not caused by swimming itself, and it is not linked only to pools.

Exposure can occur while:

Risk is higher when cuts or ongoing skin conditions are exposed to untreated or contaminated water. The bacterium grows best at temperatures below normal internal body temperature, which helps explain why infections usually affect the arms or legs rather than internal organs.

Medicines or conditions that weaken the immune system may increase the chance of extensive or deep infection. Examples include treatment that suppresses immune activity, an organ transplant, or certain blood disorders. Most cases, however, occur in otherwise healthy people after a local skin injury.

Person-to-person spread is not considered a usual route of infection. You do not normally need to avoid household contact because of it.

- Cleaning an aquarium or fish tank
- Handling fish, shellfish, or fishing equipment
- Working in aquaculture or a pet shop
- Swimming or wading with broken skin
- Caring for ornamental fish
- Sustaining a cut from a fish spine, hook, coral, or tank equipment

Diagnosis

Diagnosis begins with an examination of the skin and a discussion of recent water, aquarium, and fish exposure. Mentioning these exposures is important, even if they happened several weeks or months before the skin changes appeared.

Confirmation usually requires a small tissue sample, called a skin biopsy. Part of the sample can be examined under a microscope for granulomas and other signs of inflammation. Another part is sent for mycobacterial culture, which attempts to grow and identify the bacterium.

M. marinum needs cooler laboratory conditions than many bacteria. The laboratory therefore needs to know that this infection is suspected. Growth may take several weeks. A negative stain or an early negative culture does not always exclude the infection.

Molecular tests, such as polymerase chain reaction testing, may identify bacterial genetic material. These tests can help when cultures are negative or when a quicker species identification is needed, but availability differs.

If there is significant pain, stiffness, or limited movement, imaging may be used to look for infection in a tendon sheath, joint, or bone. Ultrasound or MRI may help define how deep the inflammation extends.

Other conditions can look similar. Testing may also consider fungal infection, other nontuberculous mycobacteria, foreign material in the skin, and non-infectious inflammatory conditions.

Treatment and management

Swimming pool granuloma is treated with antibiotics that work against M. marinum . Treatment is usually needed for longer than it would be for an ordinary bacterial skin infection because this bacterium grows slowly.

The antibiotic choice is based on the number of lesions, their depth, test results, other health conditions, and possible interactions with existing medicines. One antibiotic may be considered for a limited superficial infection, while combinations are commonly used for extensive, resistant, or deep infection.

Treatment often lasts for several months. Deep infections involving tendons, joints, or bones usually need a longer course than infections confined to the skin. Skin colour and texture can take time to return to normal even after the active infection has cleared.

Take prescribed antibiotics for the full planned course unless the prescribing healthcare professional changes the plan. Stopping early may allow infection to persist or return. Report medication side effects rather than stopping treatment without advice.

Surgery is not needed for every case. It may be used to drain an abscess, remove infected tissue, or treat infection involving a tendon sheath, joint, or bone. When the hand is affected, rehabilitation or hand therapy may help restore movement after inflammation or surgery.

During treatment, protect the area from further water exposure. Keep open sores covered with a clean, water-resistant dressing when needed. Follow instructions for wound care and attend planned reviews so healing and movement can be checked.

Complications

Most superficial infections clear with appropriate treatment. Complications are more likely when diagnosis is delayed, infection is deep, or immune defences are reduced.

Possible complications include:

Deep hand infections can initially appear mild at the skin surface. Increasing pain during movement, swelling around a finger or wrist, or loss of movement should be assessed promptly.

Antibiotics can also cause side effects, and some interact with other medicines. Monitoring may be needed during a prolonged course.

- A chain of nodules spreading along lymph vessels
- Persistent ulcers or drainage
- Infection around tendons, called tenosynovitis
- Infection within a joint, called septic arthritis
- Bone infection, called osteomyelitis
- Joint stiffness, scarring, or reduced hand function
- Widespread infection in someone with severe immune suppression

Prevention

There is no vaccine against swimming pool granuloma. Not every exposure can be prevented, but reducing contact between broken skin and untreated water lowers the risk.

Wear waterproof gloves that extend up the forearm when cleaning aquariums, handling fish, or working with potentially contaminated water. Heavy-duty gloves may also protect against cuts from equipment, shells, or fish spines.

Cover cuts and cracked skin with a waterproof dressing before water exposure. If a cut occurs, wash it promptly with soap and clean running water. Avoid cleaning tanks or handling fish with uncovered wounds.

Maintain aquariums and pools correctly. Good pool chlorination and maintenance reduce many water-related infections, although home aquariums cannot be made completely free of M. marinum .

People with weakened immune systems may need to take extra care around fish tanks and untreated water. Using tools instead of bare hands and asking someone else to clean a tank can reduce direct exposure.

Living with it and what to expect

Swimming pool granuloma usually changes slowly. Without effective treatment, a lesion may

remain for months and can gradually enlarge or produce additional bumps. It does not usually cause sudden severe illness when confined to the skin.

Once effective antibiotics begin, improvement may also be gradual. Drainage, swelling, or tenderness may lessen before the bump fully flattens. Treatment commonly continues after visible improvement because bacteria may remain in the tissue.

Regular follow-up is used to check that lesions are shrinking, no new nodules are forming, and movement remains normal. Medication tolerance may also be reviewed. A lesion that is unchanged early in treatment does not automatically mean treatment has failed, but ongoing worsening needs reassessment.

Most people with a superficial infection recover without lasting health problems. A darker, lighter, or slightly raised mark may remain where the lesion healed. Deep infection can take longer to resolve and may leave stiffness or reduced movement, particularly when a tendon or joint was involved.

Having the infection does not provide reliable lifelong protection. Another infection is possible after a later exposure. Once healed, most people can return to swimming, aquarium care, work, and other usual activities while using suitable skin protection.

When to get medical help

Arrange a routine medical appointment if you have a bump, ulcer, or draining skin lesion that is not healing, especially after contact with an aquarium, fish, shellfish, untreated water, or a swimming pool. Mention the exposure and when it occurred.

Seek prompt medical assessment if:

Get urgent same-day help for rapidly worsening swelling, severe pain, spreading redness with fever, or sudden loss of hand or joint function.

Emergency care is appropriate if you become severely unwell, confused, faint, or short of breath. Widespread serious illness from M. marinum is unusual, but these symptoms can indicate a severe infection or another urgent condition.

- New bumps are appearing in a line up an arm or leg
- Redness, swelling, drainage, or pain is increasing
- A finger, wrist, or nearby joint becomes stiff
- Movement is painful or limited
- Symptoms continue despite treatment for a routine skin infection

- You have a weakened immune system

Common questions

Can I catch swimming pool granuloma from another person?

Person-to-person spread is not considered a usual source. Infection generally follows direct exposure of broken skin to water containing M. marinum . Normal contact with family members does not usually spread it.

Is swimming pool granuloma contagious in a swimming pool?

It is acquired from contaminated water rather than directly from another swimmer. Correct chlorination and pool maintenance make modern swimming pools an uncommon source. Aquariums, fish handling, and untreated natural water are more frequent exposures.

Will it go away without antibiotics?

Occasional superficial infections may resolve, but this is unpredictable and may take a long time. Untreated infection can persist or extend into deeper tissues. A lasting lesion after water or fish exposure should be assessed rather than watched indefinitely.

Why did my usual skin antibiotics not work?

Many antibiotics used for common skin infections do not reliably treat M. marinum . The bacterium also grows slowly and may require a prolonged course of selected antibiotics. Lack of response is one reason to reconsider the diagnosis and obtain a tissue culture.

How long does swimming pool granuloma take to heal?

Healing usually takes months rather than days. Superficial infection often improves sooner than infection involving tendons, joints, or bones. Skin discolouration or a small scar may remain after the bacteria have been cleared.

Can I keep my aquarium?

Usually, yes. Avoid putting bare hands with cuts or cracked skin into the tank. Use long waterproof gloves, handle sharp items carefully, and cover wounds. During active treatment, avoiding direct contact with tank water helps prevent repeated exposure.

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