CONDITION

Pulmonary aspergilloma

A pulmonary aspergilloma is a tangled ball of fungus growing inside an existing air-filled space in the lung.

WHAT IT IS
Fungal ball inside an existing lung cavity

BODY SYSTEM
Lungs and breathing

MAIN SYMPTOMS
Coughing blood, cough, breathlessness, tiredness

WHAT CAUSES IT
Aspergillus growth in a damaged lung space

HOW IT IS DIAGNOSED
Chest CT and Aspergillus blood or laboratory tests

MAIN TREATMENT
Monitoring, surgery, antifungal treatment, or bleeding control

CAN IT BE CURED?
Sometimes - surgery can remove a single fungal ball

IS IT AN EMERGENCY?
Sometimes - heavy or ongoing coughing of blood

LONG-TERM OUTLOOK
Often stable, but bleeding or lung damage may worsen

Overview

A pulmonary aspergilloma is a ball of fungal material inside an existing cavity, or hollow space, in the lung. It is often called a "fungal ball." It usually contains tangled Aspergillus fungus, mucus, inflammatory cells, and other material.

Aspergillus is a common mould found in soil, compost, dust, and decaying plants. Most people breathe in its spores without becoming ill. An aspergilloma usually forms only when there is already an abnormal space in the lung where the fungus can settle and grow.

The cavity may have been left by tuberculosis, sarcoidosis, emphysema, a previous lung infection, or another lung condition. The fungus generally grows within the space rather than invading healthy lung tissue. This is different from invasive aspergillosis, a serious infection that mainly affects people with severely weakened immune systems.

Some aspergillomas cause no symptoms and are found during a scan for another reason. The main concern is bleeding from nearby blood vessels. This may cause small streaks of blood in mucus or, less commonly, severe bleeding.

A single, stable fungal ball is sometimes called a simple aspergilloma. If cavities enlarge, new cavities develop, or symptoms and lung damage progress, the condition may be part of chronic pulmonary aspergillosis. That distinction affects treatment and follow-up.

Symptoms

Many people with a pulmonary aspergilloma have few symptoms. Symptoms may also come from the underlying lung condition rather than the fungal ball itself.

The most characteristic symptom is coughing up blood, known medically as haemoptysis. This can range from occasional blood-streaked mucus to a larger amount of fresh blood. Bleeding may stop and return later.

Other possible symptoms include:

Weight loss, fever, night sweats, or gradually worsening breathlessness are less typical of a stable, simple aspergilloma. They may suggest chronic pulmonary aspergillosis, another infection, or a different lung problem and should be assessed.

Symptoms alone cannot confirm an aspergilloma. Several lung conditions can cause coughing, breathlessness, or blood in mucus.

- A long-lasting cough
- Shortness of breath
- Chest discomfort
- Tiredness
- Reduced ability to exercise

Causes and risk factors

An aspergilloma forms when inhaled Aspergillus spores grow inside a pre-existing lung cavity. The fungal material may gradually roll together into a rounded mass that can move within the cavity.

Conditions that can leave cavities or damaged areas include:

Structural lung damage is the main risk factor for a simple aspergilloma. A severely weakened

immune system is not usually required. However, immune-suppressing medicines or illnesses may increase the risk of other, more invasive forms of aspergillosis.

Pulmonary aspergilloma is not contagious. It does not spread between people through coughing, touch, or shared household items.

- Previous tuberculosis
- Sarcoidosis, which causes clusters of inflammatory cells in organs
- Emphysema or large air pockets called bullae
- Bronchiectasis, in which airways become widened and damaged
- A previous lung abscess or other serious lung infection
- Previous lung cancer or lung surgery
- Other forms of chronic pulmonary aspergillosis

Diagnosis

A chest X-ray may first show a rounded shadow inside a lung cavity. A chest CT scan gives more detail and is the main imaging test. A typical scan shows a solid-looking mass separated from the cavity wall by air. The mass may change position when you move, although this is not always tested or seen.

Imaging findings are considered together with your symptoms, medical history, and laboratory results. A scan appearance alone can sometimes resemble a blood clot, tumour, or other infection.

Blood testing for Aspergillus -specific IgG antibodies can show that your immune system has responded to the fungus. This is particularly useful when chronic pulmonary aspergillosis is suspected. A negative result does not exclude every case, especially if the immune system is weakened.

Sputum, the mucus coughed up from the lungs, may be tested for Aspergillus by culture or molecular methods. The fungus does not always grow in a sample. Finding it also does not prove that it is causing disease, because spores can sometimes be present without an aspergilloma.

Bronchoscopy may be used in selected cases. During this procedure, a thin flexible camera is passed into the airways. It can help locate bleeding, collect samples, or rule out another cause such as a tumour. Lung function tests may be needed when planning treatment, particularly if surgery is being considered.

Treatment and management

Treatment is based on symptoms, bleeding risk, scan changes, the condition of the rest of the lungs, and whether there is wider chronic pulmonary aspergillosis.

An aspergilloma that causes no symptoms and remains stable may not need immediate treatment. Follow-up usually involves checking for new symptoms and repeating chest imaging. The timing is chosen according to the individual findings rather than a single schedule for everyone.

Surgery can remove a single aspergilloma and the surrounding damaged part of the lung. It offers the clearest possibility of cure when the fungal ball is localised. Surgery is most often considered when there is significant or repeated coughing of blood and enough healthy lung remains to tolerate an operation.

Lung surgery can be complex because old cavities may be stuck to nearby tissues and surrounded by enlarged blood vessels. Lung function, general health, and surgical risk therefore need careful assessment.

Antifungal medicines are not automatically needed for every simple aspergilloma. Medicine may not fully reach fungus sitting freely inside a cavity. Antifungal treatment may be considered when surgery is unsuitable, when symptoms progress, or when the aspergilloma is part of chronic pulmonary aspergillosis. These medicines require monitoring because they can interact with other medicines and may affect the liver or cause other side effects.

Bronchial artery embolisation can control significant bleeding. A specialist passes a small tube through a blood vessel and blocks the abnormal artery supplying the bleeding area. It can be lifesaving or provide time for further treatment, but bleeding may return because it does not remove the fungal ball.

Management also includes treating other lung conditions, supporting smoking cessation where relevant, and helping with breathlessness or reduced fitness.

Complications

The main complication is bleeding into the airways. Small episodes can recur, and the amount of blood does not always predict what will happen next. Severe haemoptysis can interfere with breathing as well as cause blood loss.

Other possible complications include:

Breathlessness and declining lung function are often influenced by the underlying lung disease, not only by the aspergilloma.

- Enlargement of the existing cavity
- Development of additional cavities
- Progression to chronic pulmonary aspergillosis
- Secondary bacterial infection
- Gradual loss of lung function
- Side effects or complications from treatment

Prevention

Pulmonary aspergilloma cannot always be prevented. Aspergillus spores are widespread in the environment, and completely avoiding them is not practical. There is no established routine environmental measure that guarantees prevention of a fungal ball.

Prompt diagnosis and treatment of conditions that damage the lungs, such as tuberculosis, may reduce the chance of permanent cavities forming. This does not remove every risk because some cavities persist despite appropriate care.

If you already have structural lung disease, attending planned follow-up and reporting new bleeding can help identify complications early. Avoiding smoking helps protect remaining lung function, although it cannot directly remove or prevent every aspergilloma.

People with severely weakened immune systems may receive separate advice about mould exposure or preventive antifungal treatment. That advice is mainly aimed at invasive aspergillosis and should not be assumed to apply to a simple aspergilloma.

Living with it and what to expect

A pulmonary aspergilloma may remain unchanged for months or years. Some change in size, and some can disappear, but it is not possible to predict the course from symptoms alone. Repeated scans help show whether the fungal ball and its cavity are stable.

A stable aspergilloma without bleeding may have little effect on daily life. Your stamina and breathing may be affected more by the lung condition that created the cavity. Pulmonary rehabilitation, suitable physical activity, and treatment of other lung problems may help you stay active.

Coughing up small amounts of blood can be upsetting even when it stops on its own. Keep track of how often it happens, roughly how much blood you see, and whether it is mixed with

mucus or is mainly fresh blood. This information can help with follow-up.

Long-term care may involve respiratory specialists, radiologists, surgeons, and fungal infection specialists. Routine reviews focus on changes in bleeding, breathing, weight, energy, lung function, and imaging.

Treatment does not always remove the underlying lung damage. Even after successful surgery, other damaged areas may still need monitoring. If antifungal medicine is used, blood tests and reviews are usually needed to check effectiveness, side effects, and medicine interactions.

When to get medical help

Arrange a prompt medical assessment if you cough up blood for the first time, even if it is only a small amount. Blood in mucus has several possible causes and should not be assumed to come from a known aspergilloma.

Contact your usual healthcare service promptly if:

These changes usually need timely review but are not always emergencies.

Seek emergency medical help if you cough up more than a small amount of blood, the bleeding continues, or you have trouble breathing. Also get emergency help for faintness, confusion, severe weakness, blue or grey lips, or chest pain with significant bleeding. Do not drive yourself if you are bleeding heavily or feel faint.

While waiting for emergency help, sit upright and, if you know which lung is bleeding, lie with that side down if you can do so safely. This may help protect the other lung.

- Blood-streaked mucus becomes more frequent
- Your cough or breathlessness is getting worse
- You develop fever, night sweats, or unexplained weight loss
- You have new chest pain or a clear fall in exercise ability
- Treatment causes new symptoms or possible side effects

Common questions

Is a pulmonary aspergilloma cancer?

No. An aspergilloma is a ball of fungal material, not a cancer. However, its appearance and symptoms can overlap with lung cancer or other conditions. Imaging and laboratory tests are

used to clarify the cause.

Is pulmonary aspergilloma contagious?

No. You cannot catch an aspergilloma from another person. It develops after environmental Aspergillus spores settle inside an existing abnormal space in the lung.

Can antifungal medicine dissolve the fungal ball?

Not reliably. Antifungal medicine may have difficulty reaching a fungal ball inside a cavity. It is more useful when there is active chronic pulmonary aspergillosis around the cavity or when surgery is not suitable.

Can an aspergilloma go away by itself?

It can sometimes shrink or disappear, but many remain present for years. Others enlarge or cause repeated bleeding. Follow-up imaging is needed to see what is happening in a particular case.

Does coughing up blood always mean an emergency?

A small streak of blood that stops is not always an emergency, but it still needs medical assessment. Heavy, ongoing, or repeated bleeding-especially with breathlessness, weakness, or faintness-requires emergency help.

Can surgery cure pulmonary aspergilloma?

Surgery can cure a localised aspergilloma by removing it with the affected lung tissue. It is not suitable for everyone because previous lung damage, reduced lung function, and bleeding risk can make an operation more hazardous.

Sources

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