CONDITION

Multifocal atrial tachycardia

Multifocal atrial tachycardia is a fast, irregular heart rhythm caused by electrical signals from several areas of the upper heart.

WHAT IT IS
Fast, irregular rhythm from several upper-heart electrical sites

BODY SYSTEM
Heart and circulation

MAIN SYMPTOMS
Breathlessness, palpitations, chest discomfort, dizziness

WHAT CAUSES IT
Lung illness, low oxygen, heart strain, medicines, electrolyte imbalance

HOW IT IS DIAGNOSED
Electrocardiogram showing three or more distinct P-wave shapes

MAIN TREATMENT
Treating the trigger and controlling heart rate

CAN IT BE CURED?
Sometimes - often stops when the trigger improves

IS IT AN EMERGENCY?
Sometimes - severe breathlessness, fainting, or chest pain

LONG-TERM OUTLOOK
Often resolves; underlying illness shapes the outlook

Overview

Multifocal atrial tachycardia, often shortened to MAT, is a type of abnormal heart rhythm. It starts in the atria, the two upper chambers of the heart.

Normally, one group of cells acts as the heart's natural pacemaker. In MAT, electrical signals come from at least three different areas in the atria. This makes the heartbeat fast and irregular.

MAT is most often found when someone is already unwell, particularly with a serious lung condition or low oxygen level. It may also occur with heart problems, abnormal mineral levels in the blood, or certain medicines. Treating these underlying problems is usually more important than treating the rhythm by itself.

MAT can resemble atrial fibrillation, another irregular rhythm, but they are not the same. An electrocardiogram can usually tell them apart. This distinction matters because treatments used for atrial fibrillation, such as blood-thinning medicine to prevent rhythm-related clots, are not routinely needed for MAT alone.

Symptoms

Some people do not feel the abnormal rhythm. MAT may be discovered when heart monitoring is performed because of another illness.

When symptoms occur, they can include:

These symptoms are not specific to MAT. They may come from the lung or heart problem that triggered it. For example, worsening breathlessness in someone with chronic obstructive pulmonary disease may be caused mainly by a lung flare rather than the heart rhythm.

Fainting is not typical and needs prompt assessment. Severe chest pain or difficulty breathing also requires urgent attention, whether or not MAT has already been diagnosed.

- A racing, pounding, or fluttering heartbeat
- Shortness of breath
- Chest discomfort
- Dizziness, weakness, or unusual tiredness

Causes and risk factors

MAT usually develops because illness or physical stress makes several areas of the atria electrically active at the same time.

It is strongly associated with lung conditions, especially chronic obstructive pulmonary disease, also called COPD. It can appear during an acute COPD flare, pneumonia, respiratory failure, or another condition that lowers oxygen levels or puts pressure on the lungs and heart.

Other associated problems include heart failure, coronary artery disease, heart valve disease, and a blood clot in the lungs. MAT may also occur after major surgery or during another severe illness.

Low potassium or magnesium can contribute. These are minerals that help heart cells produce and carry electrical signals.

Some medicines may make MAT more likely, including theophylline and medicines that

stimulate beta receptors. These may be used for breathing problems, although theophylline is now used less often. Do not stop a prescribed medicine because of a possible connection. A healthcare professional can review its benefits, dose, and alternatives.

Older age and having several heart or lung conditions can increase the chance of MAT. The rhythm is not usually inherited.

Diagnosis

MAT is confirmed with an electrocardiogram, commonly called an ECG or EKG. This painless test records the heart's electrical activity through sticky patches placed on the skin.

The ECG usually shows:

A P wave represents electrical activation of the atria. Its shape changes according to where an electrical signal begins. Several distinct shapes show that the signals are coming from different places.

If the same pattern occurs while the heart rate is 100 beats per minute or lower, it is usually called a wandering atrial pacemaker rather than MAT.

MAT can be mistaken for atrial fibrillation because both rhythms are irregular. In atrial fibrillation, however, there are no consistent, separate P waves. Careful ECG review helps prevent the two from being confused.

Further tests look for the reason MAT developed. These may include blood tests for potassium, magnesium, infection, kidney function, or thyroid function. Oxygen levels may be checked, and chest imaging may be needed if a lung problem is suspected. An echocardiogram, which uses sound waves to examine the heart, may be used when structural heart disease or heart failure is a concern.

- A heart rate above 100 beats per minute
- An irregular rhythm
- At least three different P-wave shapes in the same ECG lead
- Clear gaps between P waves, called an isoelectric baseline

Treatment and management

The main treatment is to identify and correct the problem triggering MAT. The rhythm often settles as breathing, oxygen levels, infection, heart function, or mineral levels improve.

Care may include treating a lung flare or infection, improving oxygen levels when they are low, managing heart failure, and replacing low potassium or magnesium. Medicines that might be contributing can also be reviewed.

If the rhythm remains fast or causes symptoms, a medicine may be used to slow the number of electrical signals reaching the lower heart chambers. Options can include a beta blocker or a non-dihydropyridine calcium-channel blocker. These medicine names describe how they affect electrical signalling and heart rate.

The choice requires care. Some beta blockers like metoprolol or propranolol may be unsuitable during severe breathing problems, while some calcium-channel blockers can worsen low blood pressure or certain types of heart failure. Treatment is therefore selected according to the underlying illness and monitored response.

Electrical cardioversion, which delivers a controlled shock to the heart, generally does not stop MAT because several atrial sites continue producing signals. Common rhythm-control medicines are also usually ineffective.

Blood-thinning medicine is not routinely prescribed solely because of MAT. This differs from atrial fibrillation, where the risk of stroke may lead to anticoagulant treatment. A person who has another reason for blood-thinning medicine may still need it.

In rare, persistent cases that cannot be controlled and are causing significant problems, a procedure may block electrical signals between the atria and ventricles. A permanent pacemaker is then required to control the heartbeat. This is not usual treatment for MAT.

Complications

MAT often signals that another medical condition is placing strain on the heart and lungs. The underlying illness may be more important to the outlook than the rhythm itself.

A continually rapid heartbeat can make it harder for the heart to pump effectively. If it persists, it may contribute to worsening heart failure or, less commonly, weakening of the heart muscle.

Some people later develop atrial fibrillation or atrial flutter. These are separate rhythms and may require different assessment and treatment.

MAT itself is not generally considered a direct cause of rhythm-related blood clots. However, any new diagnosis of atrial fibrillation needs its own stroke-risk assessment.

Prevention

MAT cannot always be prevented, especially when it develops during an acute illness.

Managing long-term lung and heart conditions may reduce triggers. This can include following an agreed treatment plan, attending routine reviews, and seeking care when breathing or heart-failure symptoms begin to worsen.

Avoiding smoking helps protect lung and heart health, but it cannot guarantee that MAT will not occur. Prescribed inhalers and other medicines should be used as directed. If a medicine may be affecting the rhythm, its prescriber can review it rather than having it stopped suddenly.

Regular blood tests may be appropriate for people at risk of low potassium or magnesium, particularly when taking medicines that alter fluid or mineral levels.

Living with it and what to expect

MAT is often temporary. It may last for hours or days during an acute illness and stop when that illness improves. Some people have recurring episodes when a lung or heart condition flares. Others have a more persistent rhythm that needs ongoing rate control.

Follow-up usually focuses on the condition that triggered MAT. This might involve lung care, heart-failure management, medication review, or repeat blood tests. An ECG or portable heart monitor may be used if symptoms continue or the rhythm needs to be checked.

MAT does not necessarily prevent usual activities once the trigger has resolved and the heart rate is controlled. Recovery may take longer when it occurs during pneumonia, respiratory failure, surgery, or another significant illness.

Keep a record of recurring palpitations, breathlessness, dizziness, and possible triggers. A wearable device can record heart rate, but it cannot reliably distinguish MAT from every other irregular rhythm. An ECG is needed for confirmation.

The long-term outlook is closely tied to the underlying heart, lung, or general medical condition. MAT that settles after a reversible trigger may not cause lasting problems. Persistent MAT or serious underlying illness may require longer follow-up.

When to get medical help

Call emergency services for:

These symptoms can have several causes and should not be assumed to be MAT.

Seek prompt medical advice for a new, sustained racing or irregular heartbeat, particularly with

breathlessness, dizziness, or worsening exercise tolerance. The rhythm may need an ECG, and any underlying breathing or heart problem may need treatment.

Arrange routine follow-up if symptoms are stable but episodes keep returning, medicines are causing concerns, or recovery from the triggering illness is slower than expected. Routine visits can also review oxygen levels, blood minerals, and control of existing heart or lung conditions.

- Severe or rapidly worsening difficulty breathing
- Chest pressure or pain, especially if it spreads to the arm, back, neck, or jaw
- Fainting, severe confusion, or difficulty waking
- Blue or grey lips or skin
- A fast heartbeat accompanied by collapse or severe weakness

Common questions

Is multifocal atrial tachycardia the same as atrial fibrillation?

No. Both can produce a fast, irregular heartbeat, but their ECG patterns are different. MAT has separate P waves with at least three shapes. Atrial fibrillation has disorganised atrial activity without distinct, consistent P waves.

The distinction matters because the rhythms are managed differently.

Can multifocal atrial tachycardia go away?

Yes, it often goes away when its trigger improves. For example, it may stop after oxygen levels recover, a lung infection is treated, or low potassium or magnesium is corrected.

Persistent MAT is possible, especially if the underlying heart or lung problem continues.

Does MAT cause a stroke?

MAT by itself is not treated as having the same rhythm-related stroke risk as atrial fibrillation. Blood-thinning medicine is therefore not routinely used for MAT alone.

Someone with atrial fibrillation, a previous blood clot, an artificial heart valve, or another reason for anticoagulation needs a separate assessment.

Is MAT a dangerous heart rhythm?

MAT is not usually treated as an immediately life-threatening rhythm on its own. However, it often occurs during a significant lung, heart, or general illness. A very fast rate can also place extra strain on the heart.

Its importance depends mainly on symptoms, heart rate, and the condition causing it.

Why does COPD cause MAT?

COPD can lower oxygen levels and place strain on the right side of the heart. Breathing difficulty, changes in body chemistry, and medicines used during a flare can also make atrial cells more electrically active.

Not everyone with COPD develops MAT, and an irregular heartbeat during a flare still needs proper assessment.

Can an Apple Watch or other wearable detect MAT?

A wearable may show that the pulse is fast or irregular, but it may label different rhythms incorrectly. MAT has specific ECG features that usually require a full clinical electrocardiogram to identify.

Save any recordings to show a healthcare professional, especially if they match your symptoms.

Sources

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