CONDITION

Coronary artery fistula

A coronary artery fistula is an abnormal channel connecting a heart artery to another vessel or heart chamber.

WHAT IT IS
Abnormal connection from a coronary artery

BODY SYSTEM
Heart and circulation

MAIN SYMPTOMS
Often none, breathlessness, chest discomfort, palpitations

WHAT CAUSES IT
Usually congenital; rarely heart injury or procedures

HOW IT IS DIAGNOSED
Coronary CT angiography or invasive coronary angiography

MAIN TREATMENT
Monitoring or catheter-based or surgical closure

CAN IT BE CURED?
Sometimes - successful closure seals the connection

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

LONG-TERM OUTLOOK
Usually good with monitoring or successful closure

Overview

A coronary artery fistula is an abnormal connection between a coronary artery and another part of the circulation. Coronary arteries are the blood vessels that supply oxygen-rich blood to the heart muscle.

The connection may lead into a heart chamber, a large blood vessel, or another nearby structure. Blood then follows this low-resistance pathway instead of moving through the heart muscle's smallest blood vessels in the usual way.

Most coronary artery fistulas are present from birth. Many are small, cause no symptoms, and are found during testing for another reason. A larger fistula can divert more blood or send extra blood through part of the heart and lungs. Over time, this may place strain on the heart.

The condition is different from a blocked coronary artery. However, a fistula can sometimes reduce blood flow available to the heart muscle, particularly during exercise. This is called coronary steal .

Symptoms

Many people have no symptoms. A clinician may first suspect the condition after hearing an unusual heart sound, called a murmur.

When symptoms occur, they depend on the fistula's size, where it begins and ends, and whether it affects heart function. Possible symptoms include:

A large fistula in a baby or young child may cause poor feeding, sweating during feeds, fast breathing, or difficulty gaining weight. These can be signs that the heart is working harder than usual.

Symptoms can also develop later in life. This may happen if the fistula or connected coronary artery enlarges, blood flow through it increases, or another heart condition develops.

- Shortness of breath, especially during activity
- Chest discomfort or pressure
- Tiredness or reduced exercise capacity
- A fast, pounding, or irregular heartbeat
- Dizziness or fainting
- Swelling in the legs or abdomen

Causes and risk factors

Most coronary artery fistulas are congenital , meaning they form while the heart is developing before birth. The exact reason is usually unknown. Most cases are not caused by anything a parent did during pregnancy.

A fistula may occur by itself or alongside another congenital heart condition. It is not usually considered a directly inherited condition passed predictably from parent to child.

Less often, a coronary artery fistula is acquired later in life. Possible causes include:

The pathway may arise from either the right or left coronary artery. It often drains into a lower-pressure area, such as a right-sided heart chamber or the pulmonary artery, which carries blood from the heart to the lungs.

- Heart surgery
- Procedures involving coronary arteries or heart tissue
- A chest injury
- Infection or inflammation affecting the heart
- Rarely, a heart tumour

Diagnosis

A heart murmur, symptoms, or an unexpected finding on a scan may lead to further testing. No single symptom confirms a coronary artery fistula.

An echocardiogram , or heart ultrasound, can show unusual blood flow and whether the heart chambers are enlarged. It is often the first imaging test, especially in children. However, it may not show the fistula's full course.

Coronary CT angiography uses X-rays and contrast dye to create detailed images of the coronary arteries. It can show where the fistula starts, its route, where it drains, and whether the artery has widened.

Invasive coronary angiography involves guiding a thin tube through a blood vessel to the heart and injecting contrast dye. It gives detailed information about blood flow and may be used when closure is being considered. In some cases, diagnosis and catheter-based treatment can happen during the same procedure.

Other tests may include:

The healthcare team will consider the fistula's size and anatomy, symptoms, heart function, and the amount of blood passing through the connection.

- An electrocardiogram to check heart rhythm and electrical activity
- A chest X-ray to look for heart enlargement or lung congestion
- Cardiac MRI to assess anatomy, blood flow, and heart function
- An exercise or stress test to look for reduced blood supply during activity

Treatment and management

Not every coronary artery fistula needs to be closed. A small fistula that causes no symptoms or heart changes may be monitored with appointments and occasional imaging.

Monitoring is still important because symptoms and heart effects can change over time. The follow-up schedule is based on the fistula's anatomy, age, symptoms, and previous test results.

Closure may be considered when a fistula causes symptoms, reduces blood flow to the heart muscle, creates a substantial abnormal blood-flow pathway, or leads to complications. Decisions are best made by a cardiology team experienced in coronary abnormalities or congenital heart conditions.

There are two main ways to close a fistula.

Catheter-based closure is performed through a blood vessel, usually without open-heart surgery. A specialist guides a catheter to the fistula and places a device, such as a coil or plug, to block the abnormal connection. This approach is more suitable when the anatomy allows the device to be placed without blocking normal coronary branches.

Surgical closure involves tying off or closing the fistula during an operation. It may be preferred when the connection is very large, twisted, has several openings, is associated with a widened artery, or cannot be reached safely with a catheter. Surgery may also be chosen if another heart operation is needed.

Follow-up imaging is needed after either type of closure. A small residual leak can remain, and a closed connection can occasionally reopen. The coronary artery may also stay enlarged even after blood no longer flows through the fistula.

Medicines do not remove the abnormal connection. They may sometimes be used to manage related problems, such as an irregular heartbeat, fluid build-up, or a blood clot risk. The choice is individual and requires clinical assessment.

Complications

Most small fistulas do not cause major problems. Larger or long-standing connections can sometimes lead to:

Closure reduces abnormal flow but does not always return an enlarged coronary artery to its original size. This is one reason continued follow-up may be advised after successful treatment.

- Reduced blood supply to the heart muscle
- Enlargement of a heart chamber
- Heart failure, meaning the heart cannot pump efficiently enough
- Abnormal heart rhythms

- Widening or ballooning of the connected coronary artery
- Blood clots within a widened artery
- Infection of the heart's inner lining, called endocarditis
- Leakage or rupture of a severely enlarged vessel, which is rare

Prevention

A congenital coronary artery fistula cannot usually be prevented. It develops before birth, and its presence does not mean that anyone caused it.

Acquired fistulas related to injury or a heart procedure are uncommon. Medical teams use imaging and procedural safety measures to reduce these risks, but they cannot always be avoided.

If you already have a fistula, keeping follow-up appointments can help identify changes before they cause significant symptoms. This does not prevent the original condition, but it supports safer long-term management.

Living with it and what to expect

Many people with a small coronary artery fistula live without symptoms or major limits. They may need periodic cardiology reviews to check whether the fistula, coronary artery, or heart chambers have changed.

A fistula may remain stable for years. Some small fistulas, particularly in children, may close without treatment, but this cannot be assumed. Other fistulas enlarge or become more important as the body grows or as the heart changes with age.

After successful closure, symptoms related to abnormal blood flow often improve. Long-term imaging may still be needed to look for a remaining leak, reopening, clot formation, or persistent artery enlargement. A further procedure is sometimes needed, but not routinely.

Advice about exercise is based on symptoms, test results, and whether there is reduced blood supply or an abnormal rhythm. Many people can remain active. More intense or competitive exercise may require assessment if the fistula is large or has affected the heart.

Pregnancy increases the amount of blood the heart pumps. If you have a significant or previously treated fistula, a cardiology review before pregnancy can clarify whether extra monitoring is appropriate.

Tell healthcare professionals about the condition before heart procedures or major surgery. Good dental care is also important for general heart health. Antibiotics like amoxicillin or doxycycline before dental work are not automatically required for everyone with this condition.

When to get medical help

Arrange a routine appointment if you develop mild but persistent breathlessness, reduced exercise tolerance, new palpitations, or swelling in your legs or abdomen. These symptoms have many possible causes, but they should be assessed if they are new or changing.

Seek urgent medical advice if you have:

Call emergency services for chest pressure that is severe or does not settle, severe difficulty breathing, fainting, or symptoms of a stroke such as facial drooping, arm weakness, or trouble speaking.

If you feel well, attend planned follow-up rather than waiting for symptoms. Routine monitoring and emergency care serve different purposes.

- New or worsening chest discomfort
- Palpitations accompanied by dizziness
- Breathlessness that is becoming noticeably worse
- Unexplained fever with ongoing tiredness or shortness of breath
- New symptoms after a fistula closure procedure

Common questions

Is a coronary artery fistula serious?

It can be, but many small fistulas never cause major problems. The significance is based on how much blood passes through it, where it drains, whether the coronary artery is enlarged, and whether it affects heart function or blood supply.

Can a coronary artery fistula close on its own?

Some small fistulas close spontaneously, particularly during childhood. Larger connections are less likely to do so. Imaging is needed to confirm closure; the absence of symptoms does not prove that the fistula has disappeared.

Do all coronary artery fistulas need surgery?

No. Small, symptom-free fistulas without concerning heart changes may only need monitoring.

When closure is appropriate, it may be performed through a catheter rather than surgery. The safest method depends on the exact anatomy.

Can I exercise with a coronary artery fistula?

Many people can exercise normally. Restrictions may be considered if exercise causes symptoms, testing shows reduced blood flow, or there is an abnormal rhythm or significant artery enlargement. Personal advice should be based on your scan and test results.

Is a coronary artery fistula hereditary?

Most cases appear to occur on their own and do not follow a clear inherited pattern. A fistula can sometimes occur with other congenital heart conditions, so family or genetic assessment may be relevant in selected situations.

Can a coronary artery fistula come back after closure?

A connection can occasionally remain partly open or reopen. The original coronary artery may also remain enlarged. Follow-up imaging checks for these changes even when treatment was successful and you feel well.

Sources

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