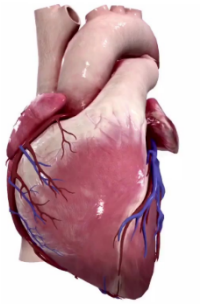
What is MINOCA?



MINOCA stands for Myocardial Infarction with Non-Obstructive Coronary Arteries. If you have a MINOCA this means that you have suffered heart muscle damage due to a lack of blood supply (heart attack), but that this is not as a result of a blockage in the main arteries supplying the heart muscle (ie the coronary arteries).

MINOCA is usually diagnosed when a patient presents with severe chest pain in an urgent care setting like an emergency department. Patients will have raised troponin (which is a heart muscle protein found in the blood which indicates heart damage) and sometimes have ECG changes. Yet when an angiogram is performed, no blockages are found. MINOCA accounts for 5-10% of all heart attacks and can often be seen in younger people and in females.

Symptoms of MINOCA

MINOCA is an acute coronary syndrome, where the person experiences severe prolonged symptoms (ie typically more than 15-20 minutes), requiring urgent medical attention. Below are just a few of the symptoms you might experience with a MINOCA. Sometimes other less common symptoms may happen too.

chest pain, pressure or tightness

Shortness of breath when you've not been exercising or very active

Suddenly feeling dizzy, sick and becoming sweaty

Chest pain or discomfort, a heavy pressure, squeezing or tight feeling in the chest, sometimes spreading to the arms, neck, jaw, back or stomach. Shortness of breath, feeling nauseous, sweaty or light-headed and extreme fatigue. These are just a few of the symptoms a MINOCA patient might experience. It is important to remember however that other issues may also induce these symptoms.

If you have chest pain that does not go away after around 15 minutes, or is very severe, or feels different to you, you should always seek immediate medical advice and call for an ambulance.

Underlying Causes

As mentioned above a myocardial infarct (or heart attack) arises from a lack of blood supply so that part of the heart muscle (myocardium) dies (infarction). This typically occurs due to severe cholesterol blockages in the coronary arteries (ie obstructive coronary artery disease) but in 5-10% of heart attacks, there are no significant blockages (ie MINOCA).

After excluding conditions that mimic heart attacks (see below), the common causes of MINOCA include spasm involving the large coronary arteries or the coronary microscopic blood vessels.

Upon presenting to the emergency department with chest pain or one of the above symptoms, the path to the diagnosis of MINOCA involves 3 key steps.

1. Heart Attack Diagnosis (acute myocardial infarction)

- The troponin level is the key diagnostic test since it indicates that the heart muscle is damaged, although not necessarily what caused it.
- The ECG may be abnormal indicating the presence of a lack of blood supply as the cause of the raised troponin. However, the ECG may be normal, especially in smaller heart attacks.

2. Coronary Angiogram Diagnosis.

- This test is primarily done to ascertain whether you have blockages in the coronary arteries. In 5-10% of heart attacks, no blockages ≥50% are found, i.e. MINOCA.

3. Excluding conditions that mimic MINOCA.

When no significant blockages are found on coronary angiography, it is important to consider other potential causes, before confirming the diagnosis of MINOCA. These can be determined by a variety of methods but the most valuable is cardiac MRI (Magnetic Resonance Imaging), which is not available at every hospital.

Important causes that mimic MINOCA include:

- Pulmonary Emboli – blood clots in the lung
- Myocarditis – an inflammation of the heart muscle caused by viral infections and some COVID-19 vaccines.
- Cardiomyopathy – an abnormal heart muscle that has multiple causes.
- Takotsubo Syndrome (Broken Heart Syndrome) – sudden onset weakened heart muscle, typically following an acute stressful situation.

How is MINOCA Treated?

The first clinical trials investigating the best treatment for patients with MINOCA are currently in progress. The treatment should be focussed upon the underlying cause, but this is not always easily identifiable.

Medications which may be considered in the treatment of MINOCA might include calcium channel blockers for coronary artery spasm, or medications routinely used in patients with conventional heart attacks (ie obstructive coronary artery disease), such as aspirin, statins, ACE (Angiotensin Converting Enzyme) inhibitors, or beta blockers. It is important to note that each patient may require an individually tailored medication protocol, as medications can often behave differently in each individual.

Smoking can damage the lining of blood vessels, so stopping smoking is an important step to try to reduce the risk of MINOCA. Maintaining a healthy weight, diet and exercise regime can also have positive effects on symptom control and ensuring you have sufficient sleep and reducing stress levels can also be of help. Adopting healthy habits and stress relieving strategies such as yoga, meditation or Tai Chi, to name but a few, can also be beneficial for angina symptoms and to overall health too.