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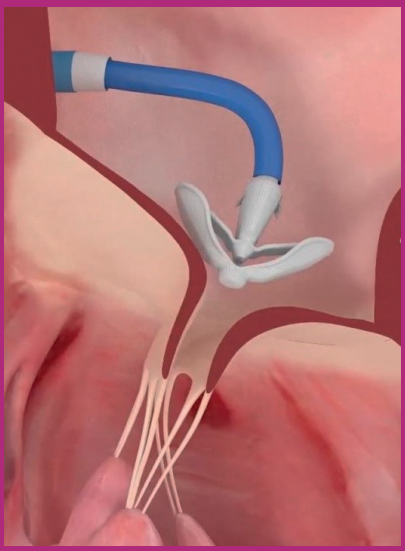
Percutaneous Mitral Valve Leaflet Repair For Mitral Regurgitation



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Contents

Mitral Valve

The mitral valve is one of the four heart valves that control the flow of blood in and out of the heart. The mitral valve separates the upper left heart chamber (left atrium) from the lower left heart chamber (left ventricle).

The mitral valve has two flaps, called leaflets. The leaflets open to let blood flow into the left ventricle, and close to stop blood flowing backwards to the left atrium.

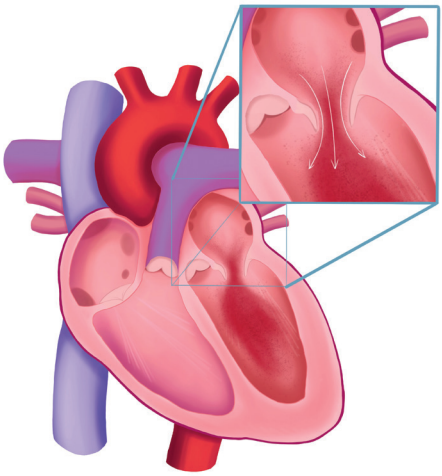


Figure 1: Heart without mitral regurgitation

Mitral regurgitation

Mitral regurgitation is a leaking mitral valve. The leaflets do not meet in the middle, so the heart pump (left ventricle) must work harder, and the chambers of the heart may enlarge.

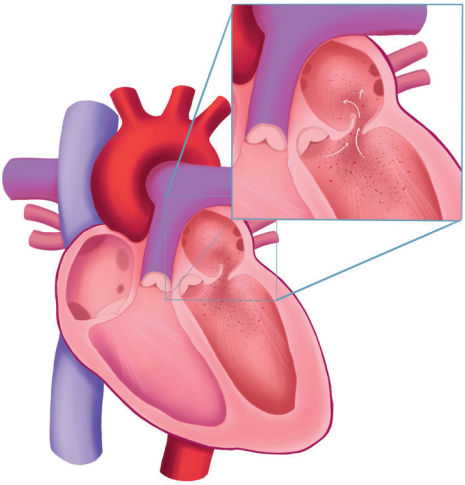


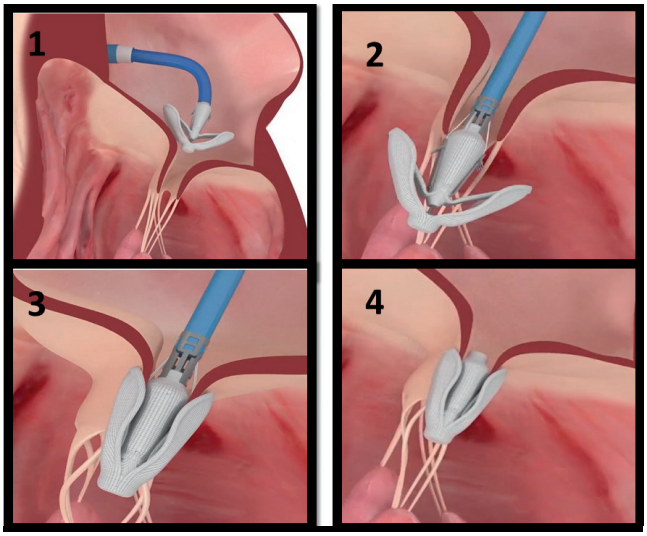
Figure 2: Heart with mitral regurgitation

Repairing a leaking mitral valve

Until recently, leaking mitral valves were repaired with openheart surgery. Open heart surgery involves a general anaesthetic (so a patient is asleep) and going through the breast bone (sternum) or between the ribs, diverting the flow of blood away from the heart, and then replacing/repairing the mitral valve. A PMVR procedure is also carried out under a general anaesthetic but is a less invasive way to repair the mitral valve.

The PMVR procedure

A PMVR procedure involves repairing the mitral valve through the skin via the groin, using a thin flexible tube, called a catheter. It does not involve open-heart surgery or cutting the breast bone. The PMVR holds the leaflets together in a specific area of the valve, with holes (orifices) on either side for the blood to flow into the left ventricle Figure below.



Steps of the procedure

1. Entering the heart
2. Positioning the repair device
3. Bringing leaky leaflets together and
4. Keeping them together so the leak is reduced

Benefits of a PMVR procedure

Even with the best medical treatment, mitral regurgitation usually gets worse over time, leading to signs and symptoms of heart failure such as breathlessness, fatigue and swollen ankles or legs (fluid overload). Seven in 10 people (over 70%) find their symptoms get better after having a PMVR procedure, and that they can get back to daily activities.

Risks of a PMVR procedure

Every medical procedure has some risk. Your doctors think you are at high risk of complications from open-heart surgery to repair your mitral valve, and that a PMVR procedure may be safer for you. The risks of a PMVR procedure include:

- Stroke: 1 and 100 people (1%) have a stroke while having a PMVR procedure
- Death: 1 in 100 people (1%) die while having a PMVR procedure. This can be due to your underlying heart problem or due to complications of the procedure
- Bleeding: 5 in 100 people (5%) have bleeding from the puncture site/s after the procedure. This is managed with manual pressure and/or a pressure device. Bleeding usually resolves within a few hours
- Collection of blood around the heart requiring drainage: 1 in 100 people (1%) have a collection of blood around the heart. The blood may need draining using a small tube inserted below the breastbone, or with an operation
- Damage to the blood vessel requiring surgical repair: Less than 1 in 100 people (1%) have damage to the blood vessel that is used to insert the catheter that requires repair through surgery
- Damage to teeth, throat or oesophagus: During the procedure, the doctor will put a flexible tube (a probe) down your throat into your swallowing tube (oesophagus). Approximately 1 in 10,000 people (0.01%) have complications from a TOE, such as damage to teeth, throat or oesophagus

Finding out whether a PMVR procedure is right for you

To find out whether a PMVR procedure is the right procedure for you, we need to do some tests. We may be able to use some of the tests you have already had done or invite you to the hospital for the day to complete them. Before a decision can be made regarding your suitability for PMVR, you will need some, or all of, the following tests:

Blood tests

We will need some up-to-date blood test results. We will carry out the blood tests in the outpatient department, or we may be able to get the results from your GP if you have had a blood test recently.

Electrocardiogram (ECG)

This enables us to look at your heart rate and rhythm.

Echocardiogram (echo)

An echocardiogram uses sound waves (ultrasound) to build up a moving picture of your heart and shows the structure and function of your heart valves and heart chambers. An echocardiogram takes around 20 minutes.

Transoesophageal echo (TOE)

A TOE is another way of carrying out an echo and allows your doctor to look more closely at your heart. A flexible tube (probe) is passed down your throat, to send sound waves to your heart, and collect echoes that bounce back. A TOE takes approximately 20–30 minutes.

Coronary angiogram

A coronary angiogram uses a series of X-rays to allow doctors to look at the coronary arteries. The coronary arteries are the main arteries that supply your heart muscle. A thin plastic tube (catheter) is guided through an artery in your wrist or groin, to your heart. Then a special dye is injected through the catheter so your arteries clearly show. A coronary angiogram takes about 30 minutes.

Computed tomography (CT) scans

A CT scan is an X-ray that produces three-dimensional images of your body. A radiographer will give you an injection containing a special dye so that your blood vessels and heart show clearly on the scan. A CT scan can also be used to look at the arteries that supply your heart muscle (coronary arteries) – a test called a CT coronary angiogram. Your doctor will discuss with you which of these tests he/she thinks is best to look at your coronary arteries. A CT scan takes about an hour. A CT scan can also be used to look at the blood vessels in your legs that will be used for the PMVR procedure.

MRSA (meticillin resistant staphylococcus aureus)

You will have a test to see if you have MRSA. MRSA is a common infection. If you have MRSA, you may need treatment before you have your PMVR procedure.

What happens after the tests?

After your tests, your healthcare team will decide if a PMVR is the best treatment for you. A member of the team will call you to explain what they recommend and to discuss the next steps with you. If a PMVR procedure is right for you, a letter will be sent to you telling you when your procedure will be, and which ward you will stay on. You will be advised which medications you need to stop, and when, before your procedure. You will come into hospital either on the day of your procedure, or the day before.

Before your PMVR procedure

Hygiene

Hygiene is very important both before and after your procedure. Have a shower the night before your admission and the morning of your PMVR procedure. Pay special attention to washing under skin folds such as under the breasts, the groin and genital area. Do not shave or remove hair from your chest, arms, legs or groin before your PMVR procedure. If needed, shaving will be done in hospital just before your procedure.

Food and drink
Do not eat anything after midnight on the day of your PMVR procedure. You can drink water, black tea or black coffee up until 6am on the day of your procedure, unless we tell you otherwise.

Medication
Continue to take your medicines as usual, unless your transcatheter valve nurse or cardiologist has asked you not to do so.

In hospital – before the PMVR procedure

Arriving at hospital
Go to the main reception, where the receptionist will direct you to your ward.

On the ward
When you get to the ward, a nurse will show you your bed. Unfortunately, we cannot guarantee a time that your procedure will take place. There may be delays if other patients need to be seen in an emergency. Staff on the ward will keep you informed.

Your anaesthetist
On the ward, you will see an anaesthetist. Anaesthetists are doctors who specialise in pain relief and care of patients who have operations and procedures.

Your anaesthetist will ask about your general health and medications you are taking, and any allergies and previous anaesthetics.

Please tell your anaesthetist/doctor/nurse if you are taking:
- anticoagulants (medicines to prevent blood clots)
- diabetes medication

The anaesthetist will plan your pain relief, and your care and recovery immediately after your PMVR procedure.

Preparing for your PMVR procedure

You will have your PMVR procedure in the cardiac catheterisation laboratory (cath lab). Before you are taken to the cath lab, you will be asked to change into a hospital gown and will have a cannula (a small plastic tube) inserted into a vein in one of your arms so we can give medication to you. When you arrive the cath lab, staff will check your identification and which procedure you are having. The anaesthetist will then put you to sleep. A ventilator (artificial breathing machine) will help you breathe during the procedure. Machines will also be used to monitor your heart rate, blood pressure and oxygen levels.

The doctor will give you an injection of local anaesthetic (a type of medication) which will numb the area around your groin, and will then insert a tube (catheter) into a vein. The tube allows doctor to reach your heart and insert the device for PMVR. The tube is also a safe way for doctors to give you drugs during your procedure. The doctor guides the tube through the vein to your mitral valve. The doctor then guides the clip through the tube to the valve. Once in place, the clip is opened and closed until it is in the best position. See page 5 of this leaflet for illustrations of the procedure. X-rays or fluoroscopy (similar to a small X-ray film of your heart) will be used to fit the clip onto the valve correctly. The PMVR procedure usually takes between two and three hours.

After your PMVR procedure

After your PMVR procedure you will go to the high dependency unit for one night for monitoring. This unit has a higher ratio of nurses to patients, so your initial recovery can be observed more closely. If your condition is stable, you will go back to the ward the next day. A heart monitor will continue to measure your heart rate and rhythm, and you may have some intravenous fluids (directly into a vein in your hand) to keep you hydrated. You may also need intravenous drugs to support your heart for a short time after the procedure. Your doctor will explain if you need drugs and how they work. When you feel ready, you can eat and drink. You may feel tired from the anaesthetic, but you can get out of bed and walk around the next day.

We expect you to get up, dressed and moving as soon as possible after your procedure. Being active will help you to recover more quickly. The area around your groin may have some bruising and may feel a little tender. A nurse will remove the dressing before you go home.

Before you go home, you will have blood tests and another echocardiogram and the specialist healthcare team will review how the procedure went and how you are recovering. A member of the team will discuss the results with you before you go home. You will have a follow-up appointment about six weeks after your procedure. At the follow-up appointment, you may have an echocardiogram to check how well your valve is working.

At home

Once you are home, you can gradually return to your normal activities. You can do gentle exercise, but you need to avoid strenuous exercise or heavy lifting for a week.

Keep the area around your groin clean and dry. It will form a scab and heal within a week or two. You should not need painkillers. If the area becomes red, or starts to itch, ooze or swell, please contact your transcatheter valve clinical nurse specialist using the contact details provided. If you feel unwell after your PMVR procedure, contact your transcatheter valve clinical nurse specialist or see your GP. If you have symptoms of extreme shortness of breath, fever or chest pain, you should go immediately to your local A&E department.

More information

If you have any questions, please contact:

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*Figure 1 and Figure 2 – Courtesy Bethany Parker (Radiographer, QEHB)
*Images – Courtesy Edwards Lifesciences

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