PROCEDURE

Mitral valve surgery - minimally invasive

Minimally invasive mitral valve surgery repairs or replaces the heart's mitral valve through small chest incisions.

PURPOSE
Restore blood flow through a damaged mitral valve

PROCEDURE TYPE
Therapeutic, minimally invasive surgery through small chest incisions

WHERE IT IS DONE
Operating theatre

ANAESTHESIA
General

HOW LONG IT TAKES
About 3 to 5 hours

PREPARATION
Fasting, medication review, blood tests and heart imaging

RECOVERY
Several hospital days; no driving until your surgical team approves

MAIN RISKS
Bleeding, stroke, infection and abnormal heart rhythms

RESULTS
Valve function checked during surgery and before discharge

Overview

Minimally invasive mitral valve surgery repairs or replaces the mitral valve through one or more small chest incisions. The mitral valve sits between the heart's upper left chamber and lower left chamber. It keeps blood moving in the correct direction.

Most operations are performed through an incision on the right side of the chest, between the ribs. The surgeon may use long instruments, a small camera or a robotic system. Unlike conventional open-heart surgery, the breastbone usually does not need to be divided completely.

The operation still requires major heart surgery. A heart-lung machine temporarily circulates and oxygenates your blood while the surgeon works on the valve.

Repair is generally preferred when it can provide a lasting result. If repair is not possible, the valve may be replaced with a mechanical valve or a biological valve made from animal tissue.

Why the procedure is performed

Surgery may be considered when the mitral valve is severely narrowed or allows a large amount of blood to leak backward.

Mitral regurgitation means the valve does not close properly. Mitral stenosis means the opening has become too narrow. Either problem can make the heart work harder and may eventually affect its size, pumping strength or pressure in the lungs.

The procedure may be offered to:

Surgery may sometimes be advised before symptoms become noticeable if tests show that the heart is beginning to be affected.

- Relieve breathlessness, tiredness or reduced ability to exercise
- Prevent or limit lasting heart damage
- Improve blood flow through the heart
- Reduce complications linked to severe valve disease
- Treat an infected or structurally damaged valve

Who should and should not have it

Minimally invasive surgery may be suitable if you need mitral valve repair or replacement and your anatomy allows safe access through the side of the chest. Your surgeon will consider the valve problem, your general health and whether other heart procedures are needed.

It may not be the best approach if you need several complex operations at the same time, such as extensive coronary artery bypass surgery or surgery on other parts of the heart. A conventional breastbone incision can give the surgeon wider access in these situations.

The minimally invasive approach may also be avoided or delayed because of:

These factors do not always rule it out. Imaging and other tests help the surgical team choose the safest approach for you. A minimally invasive operation may occasionally need to be changed to a larger incision during surgery.

- Severe disease in the blood vessels used for the heart-lung machine

- Certain previous chest or heart operations
- Chest shape, scarring or radiation treatment that limits access
- Serious lung disease that makes one-lung ventilation difficult
- An active illness that should be treated before planned surgery
- An emergency requiring the fastest or broadest surgical access

How to prepare

Your treating facility's own instructions take priority because preparation differs between hospitals and according to your health.

Before surgery, you may have blood tests, an electrocardiogram, chest imaging and an echocardiogram, which is an ultrasound scan of the heart. A CT scan may be used to examine your chest and blood vessels. Some people also need tests of the coronary arteries.

Tell the team about all medicines, supplements and non-prescription products you take. You may need specific instructions about blood thinners like warfarin or apixaban , diabetes medicines and other medicines. Do not stop prescribed treatment unless the surgical team tells you to do so.

You will be told when to stop eating and drinking. You may receive instructions for washing with an antiseptic product. Arrange help for after discharge and transport home, as you will not be able to drive yourself.

Contact the hospital before surgery if you develop a fever, respiratory illness, skin infection or another new health problem.

What happens during the procedure

You receive general anaesthesia, so you are unconscious and do not feel the operation. A breathing tube supports your breathing.

The surgeon makes a small incision, usually on the right side of the chest. Additional small openings may be used for instruments or a camera. Tubes placed in blood vessels connect you to the heart-lung machine.

The heart is temporarily stopped and protected while the mitral valve is treated. During a repair, the surgeon may reshape valve tissue, support the valve with a ring, repair the cords that control it or close a damaged section.

If the valve cannot be repaired reliably, it is removed and replaced. Mechanical valves are durable but usually require lifelong treatment to prevent blood clots. Biological valves usually do not last as long, but their long-term blood-thinner requirements are different. Your team should discuss this choice with you before surgery.

An ultrasound probe in the swallowing tube, called transoesophageal echocardiography, checks the valve before the operation ends. Drains are left temporarily around the heart or lung, and the incisions are closed.

Recovery and what to expect afterward

Pain or soreness around the chest incision is expected. You may also notice shoulder, back or throat discomfort. Pain relief should allow you to breathe deeply, cough and move safely.

You will begin with fluids and return to regular food as your stomach recovers. A poor appetite can last for several days. Follow any advice about salt, fluids or foods that interact with blood-thinning medicine.

You will usually start sitting, standing and walking in hospital. Increase activity gradually after discharge. Avoid heavy lifting and strenuous upper-body activity until the surgical team says the chest and incisions have healed.

Do not drive home. Anaesthesia, pain medicine, limited movement and the risk of a sudden heart rhythm problem can make driving unsafe. Resume driving only when your surgical team approves and you can turn, brake firmly and react without pain.

Many people need several weeks away from work. The timing is influenced by the type of work, your recovery and whether the operation was a repair or replacement. Desk work may be possible sooner than physical work.

Risks and possible complications

Possible complications include bleeding, a wound or chest infection, stroke, blood clots and abnormal heart rhythms such as atrial fibrillation. Some rhythm problems are temporary; others may need medicine, a procedure or a pacemaker.

Other risks include breathing problems, kidney injury, damage to nearby structures, heart attack, or a valve that still leaks or does not work as intended. Further surgery may be needed if there is major bleeding or a valve problem. There is also a risk of death with any heart operation.

Minimally invasive surgery has risks related to access through the ribs and the blood vessels used for the heart-lung machine. Your personal risk is shaped by your age, valve condition, other illnesses and whether additional procedures are required.

Results and follow up

The surgical team checks the valve during the operation and usually explains the early result after you are awake. Another echocardiogram may be performed before discharge or during follow-up.

Routine follow-up includes checking your incision, heart rhythm, symptoms and medicines. You will need periodic echocardiograms to monitor the valve and heart.

If you receive a mechanical valve, lifelong blood-thinning treatment is generally required. After a biological replacement or repair, medication plans differ. Take medicines exactly as prescribed and attend blood tests when requested.

Cardiac rehabilitation may help you rebuild fitness safely and learn how to protect your heart health.

Alternatives

The alternatives depend on the type and severity of the valve problem.

Ask why the proposed option is preferred, whether repair is likely and what may happen without an intervention.

- Monitoring: Regular examinations and echocardiograms avoid an immediate procedure, but the valve problem may progress and later treatment may become necessary.
- Medicines: Medicines can reduce fluid buildup, control heart rate or manage blood pressure. They may improve symptoms but usually cannot repair a structurally damaged valve.
- Conventional open surgery: A breastbone incision gives wider access and may be safer for complex or combined operations. Recovery from the chest incision is usually longer.
- Transcatheter edge-to-edge repair: A device placed through a blood vessel can reduce mitral regurgitation without open surgery. It is intended for selected patients and may not reduce leakage as completely as surgical repair.

- Balloon mitral valvotomy: A balloon opens certain narrowed valves, particularly selected cases of rheumatic mitral stenosis. It does not treat mitral regurgitation and is unsuitable for some valve shapes.
- Supportive care: Symptom-focused treatment avoids an operation but does not correct the valve itself.

When to call your healthcare team

For routine concerns, contact your team during office hours about ongoing tiredness, appetite changes, medication questions or a recovery that is not progressing as expected.

Contact the surgical team promptly for increasing incision redness, warmth, swelling or drainage; a fever; worsening breathlessness; new palpitations; rapid weight gain; or increasing leg swelling.

Seek emergency help for severe trouble breathing, fainting, sudden chest pressure, uncontrolled bleeding, or signs of stroke such as facial drooping, arm weakness or difficulty speaking. Do not drive yourself in an emergency.

Common questions

Will I be asleep?

Yes. The operation is performed under general anaesthesia. A breathing machine supports you until you can breathe safely on your own.

Can I drive home?

No. Someone else must take you home. Wait for approval from your surgical team before driving again.

How painful is it?

Chest and shoulder soreness is common, especially with movement or coughing. Pain medicine and gradual activity usually make it manageable.

When will I know if it worked?

The valve is checked by ultrasound during surgery. Your surgeon can usually discuss the early result soon afterward, with further assessment before discharge or at follow-up.

Will my valve be repaired or replaced?

The planned approach should be discussed before surgery. The final decision may be made

during the operation after the surgeon directly examines the valve.

How long will I stay in hospital?

Many people remain in hospital for several days. Your stay may be longer if you need additional monitoring or treatment.

Sources

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