PROCEDURE

Knee microfracture surgery

Knee microfracture is keyhole surgery that stimulates repair tissue over a damaged area of joint cartilage.

PURPOSE
Stimulate repair tissue over a focal knee cartilage defect

PROCEDURE TYPE
Therapeutic, minimally invasive arthroscopic surgery

WHERE IT IS DONE
Operating theatre, usually as day surgery

ANAESTHESIA
General anaesthesia, sometimes with a regional nerve block

HOW LONG IT TAKES
About 30 to 90 minutes, longer with added procedures

PREPARATION
Fasting and medication review, including blood thinners

RECOVERY
Same day; no driving until cleared and safely mobile

MAIN RISKS
Infection, blood clot, stiffness, persistent symptoms

RESULTS
Defect treated immediately; symptom improvement judged over months

Overview

Knee microfracture is an operation for a small, clearly defined area of damaged articular cartilage. This is the smooth tissue covering the ends of the bones inside your knee.

The surgeon performs microfracture through an arthroscope, a thin camera inserted through small cuts. After clearing damaged cartilage, the surgeon makes tiny holes in the bone beneath it. Blood and bone marrow cells enter the area and form a clot that develops into repair tissue.

This repair tissue is mainly fibrocartilage. It can cover the exposed bone and reduce symptoms, but it is not as strong or smooth as the knee's original cartilage. Rehabilitation is therefore an important part of treatment.

Why the procedure is performed

Microfracture may be offered when a focal cartilage defect causes knee pain, swelling, catching or difficulty with activity. "Focal" means the damage is limited to one defined area rather than spread throughout the joint.

The operation aims to cover exposed bone with repair tissue, improve how the joint surface works and reduce symptoms. It does not reverse widespread osteoarthritis.

Microfracture may be performed by itself or during surgery for another knee problem. For example, a surgeon may also treat a torn meniscus, unstable ligament or abnormal kneecap tracking.

Who should and should not have it

Microfracture is generally considered for a small, full-thickness cartilage defect. Full-thickness means the damage extends through the cartilage to the bone beneath it. Results tend to be more predictable when the surrounding cartilage is healthy and the knee is stable and correctly aligned.

Your surgeon will consider the defect's size and location, your age, activity goals, previous treatment and ability to complete rehabilitation. An MRI can help with planning, but the surgeon may only see the full extent of the damage during arthroscopy.

Microfracture may not be the right option when there is:

Surgery is usually delayed if you have an active infection, broken skin near the knee or a medical condition that is not yet well controlled. Smoking and some health conditions may affect healing, but they do not automatically rule out surgery. Your individual risks and expected benefit should be discussed before you consent.

- Widespread or advanced osteoarthritis
- A large defect better suited to cartilage or bone transplantation
- Major leg misalignment, ligament instability or loss of meniscus support that is not being corrected
- Bone damage beneath the cartilage that needs a different repair
- An inability to follow weight-bearing and rehabilitation restrictions

How to prepare

Your treating facility's own instructions take priority because fasting, medication and arrival arrangements differ between hospitals.

Tell the surgical team about all medicines and supplements you use. This is especially important for anticoagulants and antiplatelet medicines, often called blood thinners. Do not stop these unless the clinician responsible for your procedure gives you a specific plan.

You will usually need to stop eating and drinking before anaesthesia. Follow the exact times in your instructions.

Arrange for an adult to take you home. You may also need help with meals, bathing, stairs, children or pets while using crutches. Ask whether you should obtain crutches, a knee brace or a cold therapy device before surgery.

Your team may give you exercises to practise in advance. Preparing a clear walking route at home and moving commonly used items within reach can reduce the risk of falls.

What happens during the procedure

After anaesthesia, the surgeon makes small cuts around the knee. Sterile fluid expands the joint, and an arthroscope sends images to a monitor.

The surgeon examines the cartilage defect and the rest of the knee. Loose or unstable cartilage is removed, leaving a stable edge around the damaged area. The thin calcified layer on the exposed bone may also be cleared away.

A small pointed instrument is then used to make several holes in the bone beneath the defect. Marrow fluid and small amounts of blood come through these holes. This creates the clot that later forms repair tissue.

The instruments are removed and the cuts are closed or covered. A dressing is applied. Some people also receive a brace. If another knee procedure is performed at the same time, the operation and recovery may take longer.

Recovery and what to expect afterward

Pain and swelling are expected at first. Prescribed pain relief, raising the leg and using wrapped ice or a cooling device may help. Follow instructions about protecting the skin and limiting cooling time.

You can usually drink and eat once you are awake and no longer nauseated. Begin with light

food if the anaesthetic has unsettled your stomach.

Activity restrictions are important because the marrow clot needs protection while repair tissue develops. You will usually use crutches and attend physiotherapy. How much weight you can place on the leg is based mainly on the defect's location and any other procedures performed. Restrictions may continue for several weeks. Do not increase weight-bearing, stop using a brace or return to sport ahead of your rehabilitation plan.

Do not drive home. Anaesthesia medicines can affect judgement and reaction time for at least the rest of the day. Driving must also wait until you are no longer taking medicines that impair alertness and can safely control the pedals, turn to check traffic and make an emergency stop. Check your surgeon's advice and insurer's requirements.

Returning to desk work may be possible before returning to work that involves standing, lifting, climbing or driving. Your timing will be based on pain, swelling, mobility, workplace access and weight-bearing restrictions. Return to running, jumping and pivoting sports usually requires a gradual rehabilitation programme lasting months.

Risks and possible complications

Microfracture and knee arthroscopy can cause complications, although many people recover without a serious problem.

Possible risks include:

Some people need further surgery if symptoms continue or the repair breaks down. Microfracture can also influence which cartilage-restoration procedures are suitable later.

- Infection in the wounds or knee joint
- A blood clot in the leg, which can rarely travel to the lungs
- Bleeding or swelling inside the knee
- Knee stiffness, muscle weakness or prolonged pain
- Injury to a nerve, blood vessel or nearby structure
- Side effects from anaesthesia
- Repair tissue that does not form, wears down or fails to improve symptoms
- Further cartilage damage or progression of arthritis over time

Results and follow up

The surgeon can describe the defect and what was done soon after the operation. There is usually no tissue result to wait for unless a sample was taken for a separate reason.

Symptom improvement is judged over months rather than days. Early swelling and restricted activity can temporarily make the knee feel worse. Repair tissue develops gradually, and progress is linked closely to rehabilitation.

Routine follow-up checks your wounds, movement, swelling and ability to increase weight-bearing. Physiotherapy usually focuses first on restoring motion and controlling swelling, then on strength, balance and safe return to activity. Keep these appointments even if your knee feels comfortable.

Microfracture does not guarantee that pain will disappear or that you can return to the same level of sport. Benefits may reduce over time because fibrocartilage is less durable than normal joint cartilage.

Alternatives

The best alternative depends on the defect, the condition of the rest of your knee and what you want to return to doing.

Choosing observation is also reasonable when symptoms are manageable and the expected benefit of surgery is limited.

- Activity changes and physiotherapy: Avoid surgery and can improve strength and knee control, but do not fill a full-thickness cartilage defect.
- Pain medicines or anti-inflammatory medicines: May reduce symptoms but do not repair cartilage and may not be suitable for everyone.
- Joint injections: May provide temporary symptom relief in selected situations but do not reliably restore the missing joint surface.
- Arthroscopic cleaning or chondroplasty: Smooths unstable cartilage without making holes in the bone. Recovery may be easier, but it does not create replacement cartilage.
- Osteochondral autograft: Transfers small plugs of your own cartilage and bone into the defect. It provides mature cartilage but creates a second surgical site in the knee.
- Osteochondral allograft: Uses donated cartilage and bone for larger defects. It avoids taking plugs from your knee but involves donor tissue and a more complex operation.
- Autologous chondrocyte implantation: Grows your cartilage cells for later implantation. It can treat larger defects but usually requires staged treatment and longer rehabilitation.

- Osteotomy: Realigns the leg to move pressure away from the damaged area. It is a larger operation and is mainly considered when alignment contributes to the problem.
- Partial or total knee replacement: Better suited to widespread arthritis than a single small defect, but it replaces part or all of the joint.

When to call your healthcare team

Routine soreness, bruising and mild swelling can be discussed at your planned follow-up. Contact your surgical team sooner if pain or swelling is worsening rather than gradually settling.

Seek urgent medical advice for fever, increasing wound redness, pus-like drainage, uncontrolled bleeding, severe pain, new calf swelling or difficulty moving your toes.

Call emergency services for sudden shortness of breath, chest pain, coughing blood, fainting, or a foot that suddenly becomes cold, pale or blue.

Common questions

Will I be asleep?

Most knee microfracture operations use general anaesthesia, so you are asleep. A regional nerve block may also numb the leg and reduce pain afterward. Your anaesthesia team will explain the planned approach.

Can I drive home?

No. Arrange for an adult to take you home. You should not drive until anaesthetic effects have passed and you can control the car safely despite your brace, crutches or weight-bearing restriction.

How painful is it?

Pain is common during the first few days, but its intensity differs between people. Medication, cooling, elevation and following the activity plan usually help. Rapidly worsening or uncontrolled pain needs medical advice.

When will I know if it worked?

The surgeon knows immediately whether the defect was treated as planned. You may not know how much it helps for several months because the repair tissue and supporting muscles need time to develop.

How long will I need crutches?

Many people need them for several weeks. The exact period is based on where the defect is, its size and whether another procedure was performed.

Will the new cartilage be the same as before?

No. Microfracture mainly produces fibrocartilage, which is less durable than the original smooth joint cartilage.

Sources

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