PROCEDURE

Osteotomy of the knee

Knee osteotomy is surgery that realigns the leg by cutting and reshaping bone near the knee.

PURPOSE
Shift body weight away from damaged knee cartilage

PROCEDURE TYPE
Therapeutic surgical bone realignment using a controlled cut

WHERE IT IS DONE
Operating theatre

ANAESTHESIA
General, often with a regional nerve block

HOW LONG IT TAKES
About one to two hours

PREPARATION
Fasting, medication review, blood tests, and transport planning

RECOVERY
Overnight or several days; no driving until safely cleared

MAIN RISKS
Infection, blood clots, poor bone healing, nerve injury

RESULTS
Alignment immediate; healing confirmed on X-rays over several months

Overview

An osteotomy of the knee is an operation that changes the alignment of your leg. The surgeon cuts a controlled section of bone, adjusts its position, and fixes it with a metal plate and screws.

The operation is usually performed on the tibia, or shinbone, just below the knee. This is called a high tibial osteotomy. Less often, it is performed on the femur, or thighbone, above the knee and is called a distal femoral osteotomy.

The aim is to move pressure away from the damaged part of your knee and toward healthier cartilage. Unlike a partial or total knee replacement, an osteotomy preserves your natural knee joint.

Why the procedure is performed

Knee osteotomy is most often considered when osteoarthritis mainly affects one side of the knee and the leg is not normally aligned. Osteoarthritis is the wearing down of the smooth cartilage that covers the ends of bones.

A high tibial osteotomy may be used when bow-legged alignment places too much pressure on the inner side of the knee. A distal femoral osteotomy may help when knock-kneed alignment overloads the outer side.

The procedure may be offered to reduce pain, improve function, and delay the need for knee replacement. It may be particularly relevant if you are active and want to continue activities that place more demand on the knee than a replacement might tolerate.

An osteotomy may also be performed alongside cartilage repair or ligament surgery. Correcting alignment can protect the repaired tissue by reducing pressure on it.

Who should and should not have it

You may be considered for an osteotomy if:

The operation is not suitable for everyone. A knee replacement may be a better option when arthritis is advanced throughout the joint rather than limited to one area. Severe stiffness, major bone loss, or certain patterns of ligament instability may also make osteotomy less helpful.

Surgery may be avoided or delayed if you have an active infection, broken or infected skin near the knee, poorly controlled medical conditions, or blood circulation problems that could interfere with healing. Nicotine use increases the risk that the bone will not heal properly, so your surgical team may require you to stop before and after surgery.

Your surgeon will consider your symptoms, alignment, activity goals, examination findings, and imaging before recommending the operation.

- Damage is mainly limited to one part of your knee
- Abnormal leg alignment contributes to that damage
- Your knee still has a useful range of movement
- You want to remain physically active
- Nonsurgical treatments no longer provide enough relief

How to prepare

Follow the treating facility's instructions first, even if they differ from general advice here.

You will usually have standing X-rays of both legs. These allow the surgeon to measure your alignment and plan the exact correction. You may also need blood tests, an electrocardiogram, or other checks based on your health and the anaesthetic plan.

Give the team a complete list of your medicines, supplements, allergies, and medical conditions. Ask which medicines to continue or stop. This is especially important for blood thinners like warfarin or apixaban , anti-inflammatory medicines, and diabetes treatments. Do not stop a prescribed medicine without specific instructions.

You will be told when to stop eating and drinking before surgery. Arrange for someone to take you home and help during the first part of recovery. Prepare your home so that commonly used items are easy to reach, and remove loose rugs or other tripping hazards.

You may need crutches or another walking aid. If possible, learn how to use them before the operation.

What happens during the procedure

You will usually receive a general anaesthetic, which means you are unconscious. A regional nerve block may also be used to numb the leg and help control pain. Some centres may use spinal anaesthesia with sedation instead.

The surgeon makes an incision near the knee and uses X-ray guidance to confirm the planned position. The bone is then cut without separating it completely.

For an opening-wedge osteotomy, the cut is carefully opened to create a small gap. Bone graft or a bone substitute may be placed in the gap. For a closing-wedge osteotomy, a wedge of bone is removed and the remaining surfaces are brought together.

A plate and screws hold the corrected position while the bone heals. The surgeon checks the alignment and closes the incision. The procedure usually takes about one to two hours, although combined ligament or cartilage surgery takes longer.

Recovery and what to expect afterward

Pain and swelling are expected at first. You will receive pain relief, and a nerve block may keep the leg numb for several hours. Elevation and cold packs may be recommended to manage

swelling.

You can usually drink and then eat once you are awake and not feeling sick from the anaesthetic.

A physiotherapist will help you stand and use crutches. How much weight you may place on the leg is based on the type of osteotomy, its fixation, and your surgeon's plan. Some people must limit weight-bearing for several weeks. Exercises help restore movement and maintain muscle strength.

Do not drive home. You should not drive until you are no longer taking medicines that impair alertness, can walk safely, and can control the vehicle for an emergency stop. Your surgeon or insurer may have additional requirements.

Returning to desk-based work may take several weeks. Work involving prolonged standing, climbing, lifting, or physical labour usually requires more time. Full recovery and return to higher-impact activity can take several months.

Risks and possible complications

Your team will explain your individual risks before you consent. Possible complications include:

An osteotomy may delay knee replacement, but it cannot guarantee that replacement will never be needed.

- Infection of the wound, bone, or metalwork
- A blood clot in the leg or lungs
- Slow healing or failure of the bone to join
- Healing in an unintended position or loss of correction
- Injury to nearby nerves or blood vessels
- Knee stiffness, ongoing pain, or reduced movement
- Irritation from the plate or screws
- Fracture extending into the knee joint
- Compartment syndrome, a dangerous rise in pressure within the leg
- A later need to remove metalwork or have knee replacement surgery

Results and follow up

The change in alignment is created during surgery, but symptom improvement is gradual. Pain and function often improve as swelling settles, strength returns, and the bone heals.

You will have routine appointments for wound checks, movement assessment, and X-rays. The X-rays show whether the bone is joining and help determine when you can place more weight on the leg or increase activity.

Keep routine follow-up appointments even if recovery seems to be going well. Contact the team between appointments if pain or function is worsening rather than gradually improving.

Alternatives

Alternatives depend on the amount and location of damage, your alignment, and your goals.

Exercise therapy, weight management where relevant, pain medicines, and activity changes may reduce symptoms without surgical risk. They do not correct the underlying bone alignment.

An unloading knee brace shifts pressure away from the damaged side while it is worn. It is less invasive than surgery but may be uncomfortable and does not permanently realign the leg.

Steroid or other joint injections may provide temporary symptom relief. They do not restore cartilage or correct alignment, and their benefit may wear off.

Arthroscopy uses small instruments inside the knee. It may treat specific problems such as a loose body, but washing out the joint does not correct osteoarthritis or leg alignment.

Cartilage repair may help selected, limited cartilage injuries. If abnormal alignment is overloading the repaired area, cartilage treatment alone may be less likely to succeed.

A partial knee replacement replaces only the damaged section. A total knee replacement replaces the joint surfaces more widely. Replacement may provide more predictable relief for advanced arthritis, but it removes natural joint tissue and may carry activity limits and the possibility of later revision surgery.

Choosing no surgery is also an option if symptoms remain manageable and there is no urgent reason to operate.

When to call your healthcare team

Contact your surgical team promptly for increasing wound redness, drainage, fever, worsening swelling, pain that is not controlled, new numbness, or difficulty moving the foot. Also call if the wound opens or you accidentally place more weight on the leg than instructed.

Seek emergency care for sudden shortness of breath, chest pain, coughing blood, fainting, or a rapidly worsening painful and tense lower leg. A cold, pale, blue, or newly weak foot also needs emergency assessment.

Routine bruising, swelling, and discomfort should be discussed at scheduled follow-up unless they are severe, sudden, or getting worse.

Common questions

Will I be asleep?

Usually, yes. Most knee osteotomies use general anaesthesia. A nerve block may be added for pain control. Some hospitals offer spinal anaesthesia with sedation.

Can I drive home?

No. Arrange for someone to take you home. You cannot drive safely while using crutches, taking medicines that affect alertness, or unable to perform an emergency stop.

How painful is it?

Moderate pain and swelling are common during the early recovery period. Pain relief, cold packs, elevation, and gradual rehabilitation usually help. Tell your team if pain suddenly increases or is not controlled.

When will I know if it worked?

The surgeon can confirm the new alignment immediately. X-rays over the following weeks and months show bone healing. Improvement in pain and function usually becomes clearer during rehabilitation.

Will the plate and screws stay in?

They are often left in place. They may be removed later if they irritate nearby tissue or cause discomfort, but removal requires another operation.

Will I still need a knee replacement?

Possibly. Osteotomy may delay replacement by shifting pressure away from damaged cartilage, but arthritis can continue to progress.

Sources

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