

Tibial plateau fracture

What you're feeling

A tibial plateau fracture is a break in the upper part of your shin bone, right where it forms the lower half of your knee joint. The knee is usually swollen and tender, and it may look out of shape. The swelling comes from bleeding inside the joint, which can give the knee a soft, doughy feel.

The pain sits deep in the knee and over the upper shin. It is usually worse when you try to put weight on the leg, twist the knee, or straighten it against resistance. Standing from a chair, climbing stairs, and getting into or out of a car all become hard because they load the broken bone. Walking any distance is often too painful without support, and many people need crutches in the early days.

The pain often flares at night and after time on your feet, even small amounts. Resting with the leg raised usually settles it. The knee may feel loose or give way, especially if the fracture has shifted the joint surface.

Some fractures happen after a fall from a height, a car crash, or being hit by a car as a pedestrian. Others come from a simple fall or twisting injury, more often in older bones that have lost strength. Either way, the force that breaks the bone can also injure the soft tissues around the knee, including the cartilage pads and the ligaments that hold the joint steady.

Watch for warning signs in the first few days. Severe pain that seems far greater than the injury itself, a tense and very swollen calf, pins and needles or numbness in the foot, or a foot that looks pale needs urgent review. These can signal pressure building up in the muscle compartments of the lower leg, which needs prompt treatment. Numbness or weakness around the foot and ankle can also mean a nerve has been stretched by the injury. Tell your care team straight away if any of these appear.

What's actually happening

The top of your shin bone widens into two rounded platforms that meet the thighbone and carry your weight. Think of them as two pillars holding up a roof. The pillar on the outer side is smaller and slightly weaker. It carries less load, so it is the one that usually gives way first. In most of these fractures, the outer platform is the part that breaks.

The force that does this is usually a mix of two things: the leg buckling sideways, and your body weight driving straight down through the bone. This often happens when you land heavily on a straight, weight-bearing leg, such as in a fall from a height. When the bone is pushed down and crushed rather than cleanly split, the joint surface sinks below its normal level. That sunken patch is what makes weight-bearing so painful and can leave the knee feeling unstable.

The pattern depends a lot on the bone itself. Strong, younger bone tends to crack and split into pieces that stay roughly in place. Older bone that has lost strength tends to compress and dent instead, like a soft biscuit pressed with a thumb. Some fractures involve both platforms, which generally means a bigger force and a more serious injury.

The same force can also damage the soft tissues inside the knee. The two cartilage pads that act as shock absorbers between the bones, and the ligaments that hold the joint steady, can be stretched or torn. This is why some knees with these fractures feel loose or give way, not just painful.

If the break leaves the joint surface uneven, or lets the knee sag into a knock-kneed or bow-legged shape, the load across the joint stops being shared evenly. That uneven loading is what these injuries need treatment to prevent, because it can set up wear-and-tear arthritis and lasting problems with walking.

What we can do about it

Dr Kieran Hirpara, an orthopaedic surgeon at Mater Private Hospital Rockhampton, matches the treatment to your specific injury. Patients are generally referred to our clinic by their GP; if a physiotherapist has suggested you see us, you will still need a referral from your GP in order to be eligible for the Medicare rebate. At the clinic visit we take a history, examine your knee, and arrange imaging where it is needed. X-rays give a quick first picture of the break. A CT scan builds a more detailed view of the joint surface and is usually done before any operation. An MRI scan is not routine, but it can pick up damage to the ligaments and cartilage pads inside the knee that other scans miss.

Because this is an acute injury, surgery may be recommended straight away, without a trial of non-operative care first. That said, not every one of these fractures needs an operation. If the break has not shifted the joint surface, or the dent in it is small and your knee is stable when examined, we may treat it without surgery. That usually means a hinged brace that lets the knee move early while protecting the break, with crutches and limits on how much weight you put through the leg at first. Physiotherapy starts early and aims to restore movement and strength while the bone heals. For older or less active people, or when other health problems make surgery risky, a small amount of unevenness in the joint surface can often be lived with.

Surgery is considered when the break has shifted the joint surface, when the knee cannot be expected to line up and stay steady on its own, or when the knee is unstable. A split piece of bone, a dent covering more than half of the outer platform, a break involving the small bone at the side of the knee, or a knee that has been pushed into a knock-kneed position are all strong signs that surgery is needed. The aim of the operation is to lift the sunken joint surface back to its normal level, hold the pieces in place with plates and screws, and restore even loading across the knee so it moves well without pain or giving way. Sometimes a bone graft or a special bone

cement is used to fill the gap left under the lifted surface and support it while it heals. How we decide, and what the operation involves, is covered on the operation page.

What to expect

Most tibial plateau fractures settle into a predictable pattern over weeks to months. The severe pain of the first days eases as the bone knits, and the swelling goes down gradually. Movement and strength come back slowly with physiotherapy, and it is normal for progress to feel gradual rather than steady. Even so, a knee that has had this injury rarely feels quite the same as before. The knee will usually work less well than your other knee, and fractures that involve both platforms tend to leave more lasting stiffness and weakness than those affecting one side.

If the break is small and your knee is stable, treatment without surgery can work well. The joint surface tolerates a small amount of unevenness, and properly chosen fractures treated this way heal with good function. Severe, disabling wear-and-tear arthritis after this kind of treatment is very unusual. Surgery for a shifted or unstable break aims to restore even loading across the knee, and carefully chosen patients can expect good results from it too. Leaving a badly displaced fracture untreated is the riskier path: the knee can settle into a knock-kneed or bow-legged shape, which loads one side of the joint unevenly, makes the knee feel unstable, and can affect your balance and lead to falls.

Recovery does not stop at the bone. Some knees keep feeling loose or give way after the fracture has healed, and your walking pattern and quality of life can stay a little different for a long time. Returning to sport takes patience. Fewer than half of skiers with this fracture were back on the slopes three years after surgery, though people generally return to recreational sport in gradually increasing numbers as time passes. On the positive side, scores that patients report about their own knee keep improving beyond the first year.

A small number of people need more surgery later. Older patients and those with more severe fractures are more likely to need a total knee replacement down the track, and a knee left unstable or unhealed tends to need one sooner. Serious early complications are uncommon but real, so keep your follow-up appointments and report anything that feels wrong.

When to see someone

Go to an emergency department if you have severe pain that seems far greater than the injury itself, a tense and very swollen calf, pins and needles or numbness in the foot, or a pale foot. These can signal pressure building up inside the muscles of the lower leg, a condition called compartment syndrome. It needs same-day emergency assessment and treatment. Also go straight to hospital if your foot is cold, numb or weak, which can mean a blood vessel or nerve has been damaged. A normal pulse does not rule this out, so any difference between the two legs matters. See your GP promptly for a swollen, painful knee after a fall or twist that will not settle, especially if the knee looks out of shape or gives way.