

A PATIENT'S GUIDE

ACL INJURIES



The Orthopaedic Speciality Clinic

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Our Services :

Sports Injuries

Arthroscopic Surgery

Primary/ Revision Joint Replacement

Deformity Correction with Osteotomy



Normal ACL



How does the ACL get injured ?

Injuries to the ACL are commonest amongst those indulging in contact sports like football, martial-arts or some non-contact sports involving twisting movements like tennis. When the body is in motion, momentum is developed and a sudden impact on the knee (like a tackle in football) or uncontrolled landing from a jump (like in badminton) can cause the ligament to tear.

Two wheeler accidents are also an important cause of an ACL injury in India.

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Torn ACL



What are the symptoms of an ACL injury ?

Swelling of the knee, which develops gradually after hours, is an early feature. This is due to bleeding inside the knee joint. Some patients do hear a **snapping or popping** sound when the ligament tears. Pain is present only initially and may not allow full weight bearing comfortably. Persistence of pain for several days after the injury, is a bad sign and is usually due to an associated meniscus tear or cartilage injury. **Instability** is the commonest symptom due to ACL deficiency. The knee buckles during walking or more commonly while turning. This is because the control of these movements is lost when the ACL is torn.

Does the ACL heal if left untreated ?

Enzymes present in joint fluid do not allow a blood clot to develop. Hence ACL tears don't heal naturally. The ACL also has poor blood supply which, in itself, precludes a good chance of spontaneous healing. Partial tears, however, may heal over time even if not treated. These are not easily predictable in every patient.

Why should ACL tears be treated ?

ACL tears cause symptoms of instability or pain. These are not pronounced in a patient with low-demand physical activity. Patients with high-demand activities like sports persons or those into regular exercises / gymming / cycling, etc. feel disabled due the recurrent instability and are not able to perform at the desired level. The rationale of treatment is thus, two-fold:

1. To restore stability

2. To optimize function to the pre-injury level

An unstable knee can lead to two important and possibly devastating sequelae. Firstly, a knee which keeps buckling repeatedly can tear the menisci (cushion shock absorbers within the joint) due to abnormal mechanics. Secondly, the uncontrolled mobility can damage the cartilage, which is the smooth gliding surface of the joint. Both these issues can lead to degenerative arthritis of the knee over a period of a few years and further disability.

Can ACL tears be managed without surgery ?

Yes. a partial tear, in which most fibers of the ligament are intact, do not require surgery. They usually do not cause instability. The presence of a partial tear needs to be accurately diagnosed by a high resolution MRI scan. Sometimes, a special MRI called the Porto-KT MRI is needed to quantify the instability and help in decision making. Tears in patients who lead sedentary lives can also sometimes, be treated without surgery. All such patients require special bracing and a specific physiotherapy program. This program is aimed at reducing swelling, achieving full range of motion, restoring muscle power and proprioception (balance).

What is the surgical treatment of ACL tears ?

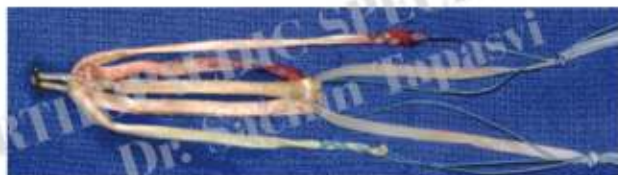
The aim of operating an ACL tear is to achieve stability and restore function. The decision to operate is made for patients who have high demand on their knees, are unwilling to modify their activity level or have failed a trial of conservative treatment. Prior to surgery, prehabilitation by physiotherapy is often prescribed to reduce swelling, achieve range of motion and muscle power. This is called the ACL perturbation program.

Once the knee is ready to be operated upon for ACL reconstruction, you will be required to get some blood tests and other investigations done in preparation for the surgery. Thereafter, a physician consultation is needed to obtain approval for surgery. Surgery for ACL is performed by arthroscopy (key-hole surgery). Since this ligament does not heal well when repaired, it is reconstructed by using the body's own tissue, called a graft. The grafts used for this reconstruction are expendable i.e. their removal does not cause any residual deficits and they are able to function like the ACL when implanted.

The three commonly used grafts are:

1. Hamstring tendons -

The hamstrings are the taut cord like structures present on the inner side of the knee and thigh.



Hamstring graft

2. Bone - patella tendon - bone

This graft includes a part of bone from the knee cap, the tendon on the front of the knee and another bone piece from the shin bone.



Bone-patella tendon-bone graft

3. Central quadriceps tendon -

It is from a part of the quadriceps tendon on the front of the thigh, just above the knee, with or without a piece of bone from upper part of the knee cap.



Central quadriceps tendon graft

The decision to use a particular graft is individualized for every patient and is determined by type of sports, associated injury, etc.

The graft is prepared and fashioned like the ACL. By arthroscopic surgery, tunnels are drilled to place the ACL graft. The graft is then inserted inside the joint. It is fixed to the thigh bone on top & shin bone below, most commonly with biodegradable screws but sometimes metal screws or buttons may be used. The biodegradable screws degrade within the bone and do not require removal at a later stage.



Suspensory Button

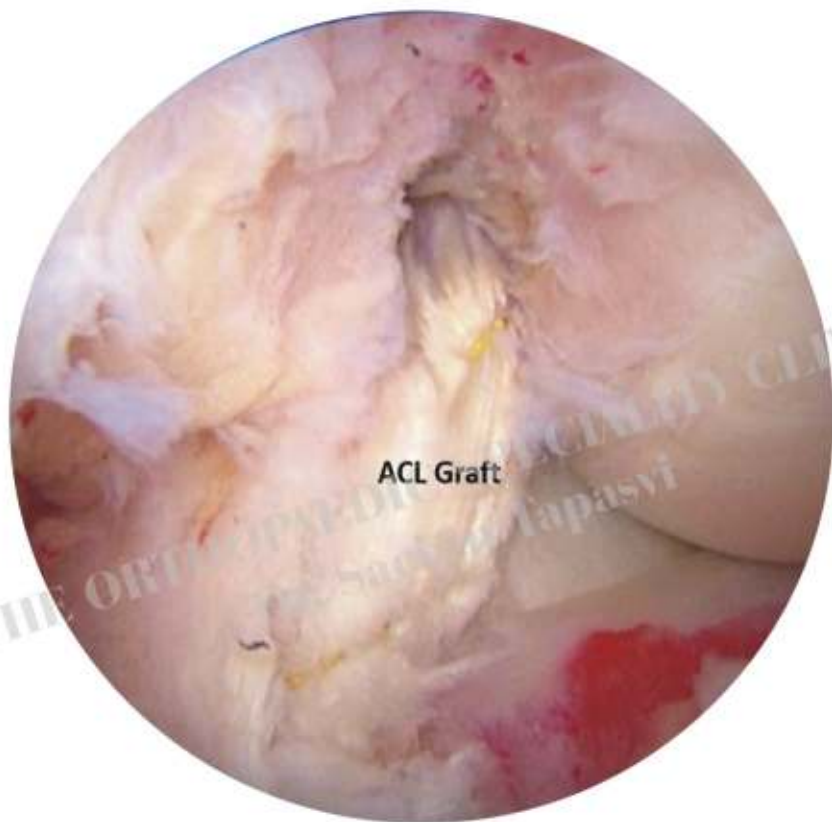


Titanium Screw



Bio Screw

Reconstructed ACL



What is the hospital procedure if I plan to undergo ACL reconstruction ?

For an ACL reconstruction, admission in the hospital is usually on the day of surgery. After completing the admission procedure, you will be shifted to your allotted room. You will be explained and requested to sign a consent for the surgery. An anesthesiologist will examine you prior to the surgery. ACL reconstruction is usually done under spinal anesthesia, but sometimes general anesthesia is also used. These options will be explained to you and an informed consent obtained for the same. Whatever be the anesthesia choice, be rest assured that your operating room experience will be a tranquil one. Once the operation theatre is ready, you will be shifted there. The surgical time for a typical ACL reconstruction is about 45 minutes, but the total duration in the operation theatre, from anaesthesia to recovery is about 2 hours.

Is this surgery a painful undertaking ?

Some pain after any surgery is inevitable. However, with the current tools at our disposal to manage post-operative pain, this is minimal and not bothersome. You will be discharged on some pain medications to enable you to perform activities of daily living and physiotherapy without much discomfort.

What about recovery after surgery ?

Will physiotherapy be needed ?

Physiotherapy is begun on the day of surgery with an aim to rehabilitate your knee. The operated knee is placed in a long knee brace, for full time wear, for about 3 weeks. A small suction drain is placed inside the joint to drain any collected blood and this is removed the next day. Your knee will be placed in a continuous passive machine (CPM) by the physiotherapist to move the knee, which helps reduce the swelling. Weight bearing as tolerated is usually allowed from the next day. No walking aids are necessary but one may use an elbow crutch for comfort for a few days. Icing the knee using a Cryocuff helps reduce pain and swelling. Discharge from the hospital is usually after one but sometimes, after two days.



Long Knee Brace

(Usually worn for first 3-4 weeks)



Hinge Knee Brace

(Usually worn for 1-2 months after 1 month post surgery)

The aim of therapy is to achieve knee motion, muscle strength, and reduce swelling. Adherence to the physiotherapy protocol helps in faster recovery and reduces complications. At about 3 weeks after surgery, the long knee brace is changed to a hinged knee brace, which is used only while standing and walking for about 3 months. Therapeutic gym program is also started and you may be fit to join office or studies at this point. Driving is started after 4 weeks, which is when the knee starts feeling "normal". Swimming can be started after 2 months and running after 3 months.

Sports specific training is initiated after 6 months and return to competitive sports is after about 9 months. These milestones in recovery are modified and usually delayed in those who have concomitant injuries, like a meniscus tear or another ligament injury.

Bathing After Knee Surgery

The surgical incision following your surgery will typically be closed using absorbable stitches. This does not require subsequent removal. Sometimes, skin staples or stitches may be used which need removal later. In all cases however, an absorbent water repellent dressing is applied. You may take bath at home after discharge but the dressing must not be made wet. Bath must be taken sitting on a high plastic chair or stool and preferably under shower. Care must be taken to prevent a slip and fall in the bathroom.

Here are some ways in which you can protect the dressing from getting wet.



A typical knee dressing following replacement surgery or ligament reconstruction



Commercially available plastic covers are ideal for occluding the dressing. These are easy to wear and remove with minimal assistance and can be reused multiple times.



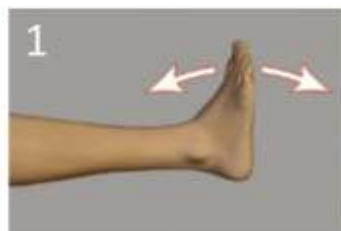
A cling wrap which is used for food packaging is easily available in departmental stores. This is also easy to apply and affords adequate water proofing. The wrapping must extend at least 3 inches above and below the dressing limit.



A large garbage collecting bag can also be used. It is equally easy to put on. However, care must be taken to seal the top end completely to prevent water from trickling inside.

Early Post-operative exercises :

These exercises are important for increasing circulation to your legs and feet to prevent blood clots. They are necessary to strengthen muscles, improve your knee movement and prevent the formation of scar tissue that would make the knee stiff. Do not give up if some exercises feel uncomfortable at first: They will speed your recovery and reduce your postoperative pain. All exercises should be done SLOWLY. Not every exercise is appropriate for every patient. Your therapist will check off the exercises that are right for you. Unless otherwise indicated, do these exercises every day in three sessions : morning, afternoon and night.



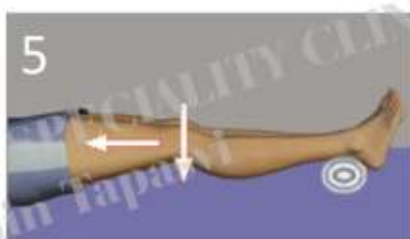
Ankle pumps : Slowly move your foot up and down. Do this exercise several times as often as every five or 10 minutes. This exercise can be done while you are either lying down or sitting in a chair.



Ankle rotations : Move your ankle inward toward your other foot and then outward away from your other foot. Repeat five times in each direction. This exercise can be done while you are either lying down or sitting in a chair.



Standing knee bends : Standing erect with the aid of a walker or crutches, lift your thigh and bend your knee as much as you can. Hold for five to 10 seconds. Then straighten your knee, touching the floor with your heel first. Repeat several times until fatigued.



Quad set :

Tighten your thigh (quadriceps) muscle. Try to straighten your knee while pushing the back of your knee to the bed. Hold for five to 10 seconds. Repeat this exercise 10 times for each leg (not just your operated leg).



Sitting supported knee bends:

Sit on a bed or chair with your thighs supported. Alternately straighten and bend your knee, using the foot of your unoperated leg to push your operated leg up (left-hand illustration) and back (right) as far you can. Hold your knee in the full bent / straightened position for five to 10 seconds. Repeat several times until your leg feels fatigued or until you can completely bend and straighten your knee.



Standing knee bends :

Standing erect with the aid of a walker or crutches, lift your thigh and bend your knee as much as you can. Hold for five to 10 seconds. Then straighten your knee, touching the floor with your heel first. Repeat several times until fatigued.



Sitting unsupported knee bends :

Sit on a bed or chair with your thighs supported. Bend your knee as far as you can until your foot rests on the floor. With your foot lightly resting on the floor, slide your upper body forward in the chair to increase your knee bend. Hold for five to 10 seconds. Straighten your knee fully. Repeat several times until your leg feels fatigued or until you can completely bend your knee.



Bed-supported knee bends :

Bend your knee as much as possible while sliding your foot on the bed. Hold your knee in a maximally bent position for five to 10 seconds and then straighten. Repeat several times until your leg feels fatigued or until you can completely bend your knee.



Assisted knee bends :

Lying on your back, place a folded towel over your operated knee and drop the towel to your foot. Bend your knee and apply gentle pressure through the towel to increase the bend. Hold for five to 10 seconds. Repeat several times until fatigued.

Knee exercises with resistance :

You can perform any of the early or advanced exercises with light weights around your ankle. (Inexpensive wraparound ankle weights with Velcro straps can be purchased at most sporting goods stores.) These resistance exercises usually can begin four to six weeks after your surgery. Use one- to two-pound weights at first; gradually increase the weight as your strength returns.

Stationary bicycle exercise:

Exercising on a stationary bicycle is an excellent activity to help you regain muscle strength and knee mobility. Adjust the seat height so that the bottom of your foot just touches the pedal with your knee almost straight. Pedal backwards at first. Pedal forward only after a comfortable backwards cycling motion is possible. As you become stronger (at about four to six weeks) slowly increase the tension on the pedals. Pedal forward 10 to 15 minutes twice a day, gradually building up to 20 to 30 minutes three to four times a week.

What are the complications of ACL surgery ?

Arthroscopic ACL reconstruction is a safe surgery if the patient is optimized prior. However, every surgical procedure has some risks. General complications like adverse reaction to a drug or anaesthetic agent or an acute cardiac event are no greater than for any other surgery. Pneumonia, especially after general anaesthesia or in the presence of viral respiratory infection, is another remote possibility in a previously healthy individual. Similarly, deep vein thrombosis or clotting in calf veins is unusual after an ACL reconstruction, but possible, especially in smokers and those on oral contraceptive pills.

Specific complications include:

Infection: The incidence after arthroscopic surgery is about 0.5%. Though every care is taken in terms of a sterile operating room environment, prophylactic antibiotics before surgery, etc., this cannot be brought to zero. Superficial infections can be treated with oral antibiotics alone. However, deep infections have to be managed by hospital admission, surgical wash-out and intravenous antibiotics. Prolonged antibiotics for 3-4 weeks and repeat surgery may also be required in some cases.

Bleeding: Bleeding from the joint is uncommon. Normally the drain placed inside the joint removes all collected blood. Excess bleeding is seen in smokers and those on blood thinning medications like aspirin.

Nerve injury: A small nerve, present on the inner side of the thigh commonly gets injured while removing the hamstring tendons. This causes numbness on the lower and outer side of the knee. This does not cause any significant problems and gradually recovers over a period of 3-4 months.

Anterior knee pain: This is a possibility especially if a bone-patella tendon-bone graft is used. It can cause pain on kneeling and gradually resolves over time.

Stiffness: This is very rare after ACL surgery and usually due to noncompliance with rehabilitation physiotherapy. Recovery of motion by physiotherapy is possible. Non responsive patients may be taken up for knee manipulation under short anesthesia as a day care procedure.

Graft failure: Recurrent trauma can cause the graft to rupture. The knee would swell up again and movements become painful. Instability may develop. Such patients have to undergo a revision ACL reconstruction surgery in a single or double stage.



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