

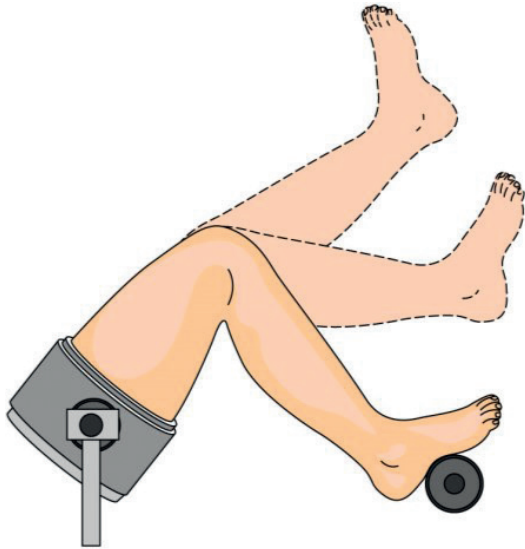
SURGICAL TECHNIQUE
RECONSTRUCTION OF THE PCL USING THE BTB METHOD



Reconstruction of the PCL using the BTB method

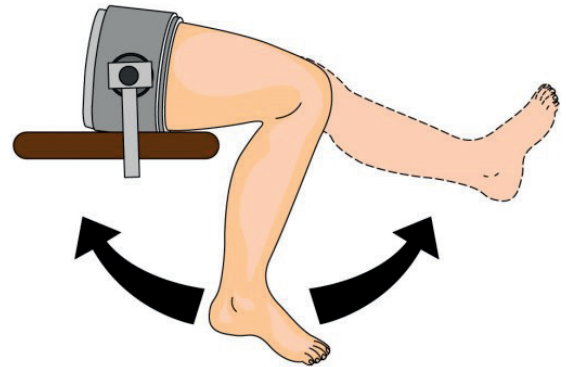
1. The patient's position

a) The patient lies on his/her back, the operated limb is supported by the adjustable stand which will ensure movement of the extremity from full extension into full flexion.



b) The patient lies on his/her back, operated extremity is loosely hanging through knee support which allows to bend the knee up to 120 degrees.

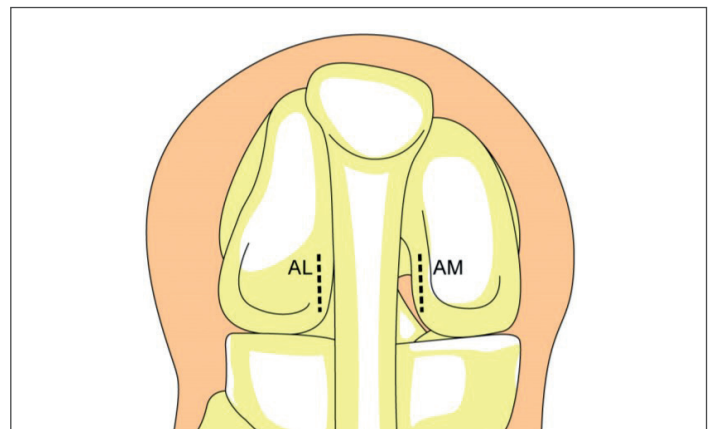
Cover the extremity with drapes using usual sterile manner.



2. Examination of the patient and arthroscopy of the knee joint for verification of an intra-articular finding and for the clarification of the subsequent procedure (ligament reconstruction)

Arthroscopic portals

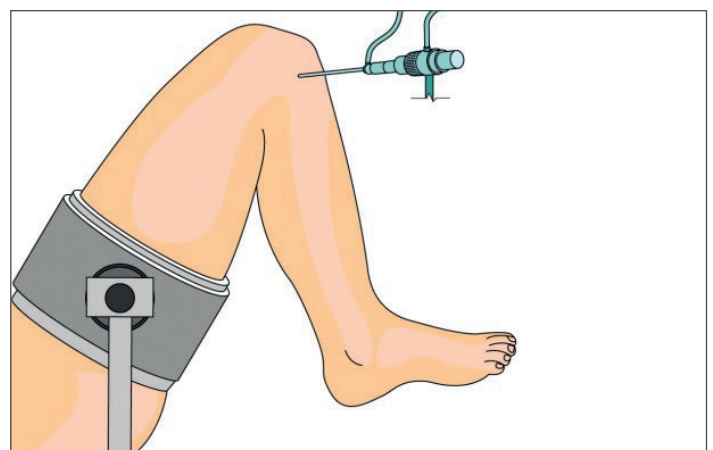
By incision into the skin create AL (anterolateral) and AM (anteromedial) arthroscopic portals, which allow sufficient overview of the knee joint to the extent that it is necessary for the reconstruction of the ligament.



Diagnostics

Perform a complete diagnostic arthroscopy, treat any intra-articular pathology of the meniscus, cartilage etc., remove loose debris of the torn anterior cruciate ligament.

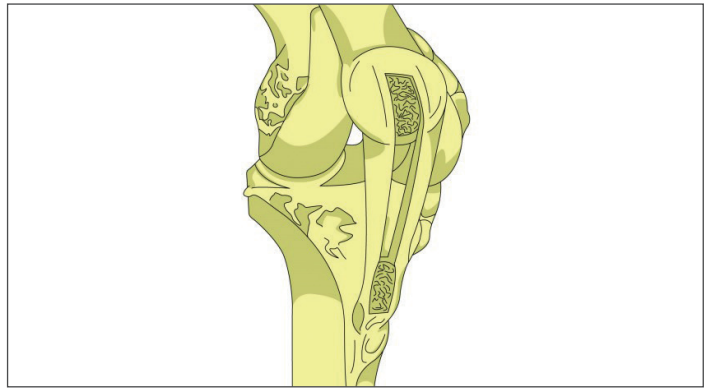
After examination of the joint and clarification of the scope of the operations (PCL reconstruction) move on to the next points.



3. Collection of the graft and treatment of patellar tendon BTB (Bone Tendon Bone)

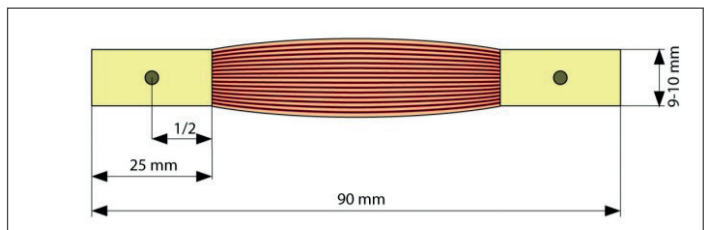
The graft comes from the middle 1/3 of lig. patellae, with two bone pieces (where the ligament is attached to the bones).

One of the bone pieces comes from the patella, the other from the proximal portion of tibial tuberosity.



The total length of the tendon is approx. 90 mm, width 9–10 mm, the recommended size of the bone piece is approximately 25 x 9 x 5 mm.

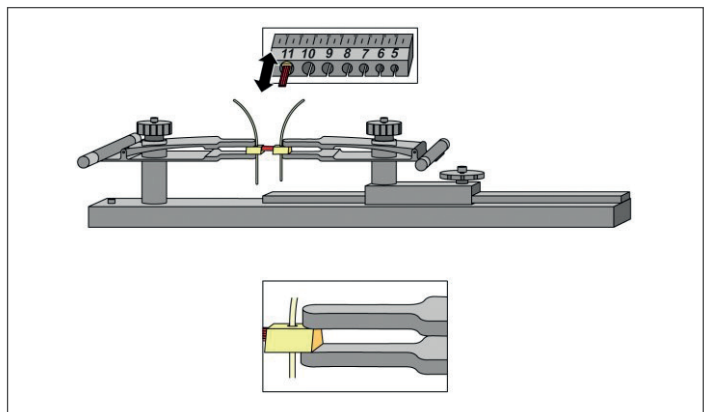
Drill a 2 mm hole into the centre of the bone pieces from each side for fitting a thread to allow pulling the graft through the bone tunnel.



Adjust the bone pieces according to the sizes needed and ensure smooth edges. Pull the thread (nylon no. 6) through the tunnel in the bone pieces and check the size of the graft and bone pieces by pulling through the gauge for the graft diameter.

Drill diameters for the drilling of tunnels for the reconstruction of the anterior cruciate ligament and screw diameters to secure ligaments are later selected according to the graft diameter.

It is recommended to drill the tunnels approximately 1 mm greater in diameter than the diameter of the prepared tendon (piece) for the reconstruction of the PCL by the BTB method.



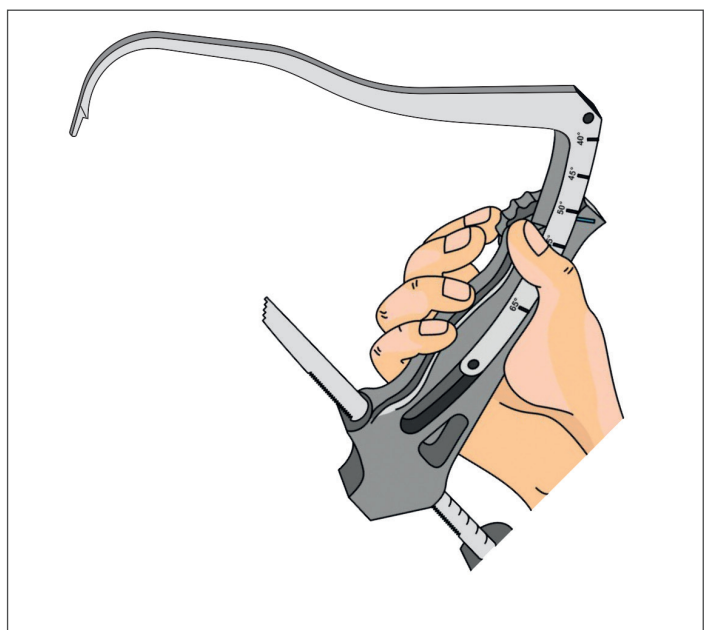
4. The installation of the aiming device

Use the handle 129 12 0510 with the aiming arm PCL Tibial 129 12 0530 for the aiming of the tunnel for reconstruction of posterior cruciate ligament in tibia.

The angle setting on the scale depends on the height of the working portal, this determines the drilling angle which is usually 60° by the reconstruction of the posterior cruciate ligament.

The angle of the arm does not change during the procedure.

Insert the arm into the groove of the handle, adjust the angle on the scale with the colourful groove on the handle and firmly fix the arm with the handle.



5. Aiming and drilling of the tibial tunnel using drilling wire

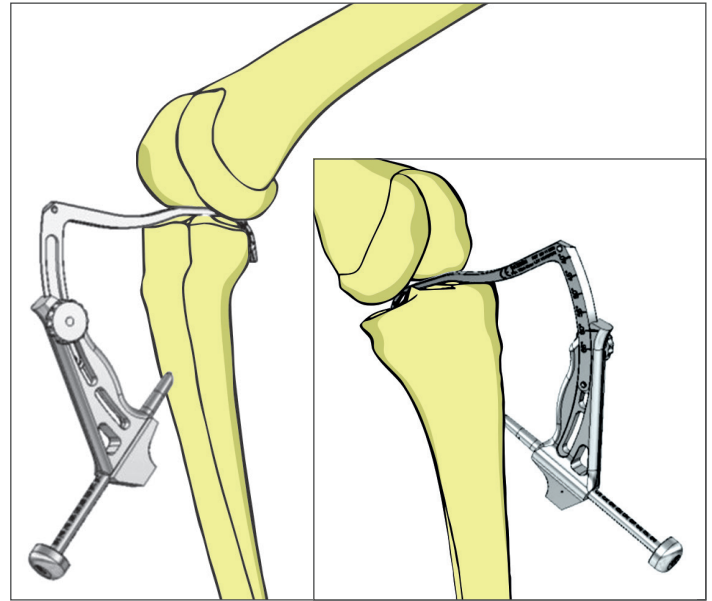
It's possible to aim drilling of the tibial tunnel for the PCL reconstruction after the accurate preparation of the place for the position of the dorsal opening of the tibial tunnel (with help of the posteromedial portal, shaver and electrocoagulation, too). It's necessary to be very cautious during this preparation and avoid the damage of the neurovascular structure in popliteal fossa.

The introduction sleeve is inserted through approximately 2.5 cm incision in anteromedial portal, approximately 6-10 cm distally under anteromedial portal and is leaned against anteromedial part of the tibia.

The arm of PCL Tibial is inserted through the anteromedial entrance opening in the centre of the area intercondylaris posterior about 15 mm distally from the tibial surface.

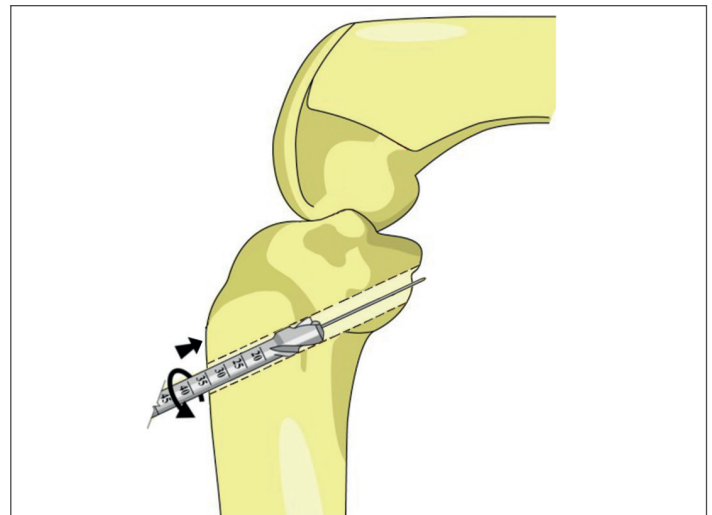
The wide ending of the arm with the groove provides a sufficient protection in the back part of the knee joint from the potential injury of neurovascular bundle (beware of the course of a popliteal artery!) when drilling the aiming wire.

The introduction of the aiming wire is necessary to monitor using an inserted arthroscope and the force applied to the drill is necessary to adapt according to position of the wire which comes through the bone. The aiming wire comes to the ending of the arm.



6. The drilling of the tibial tunnel using cannulated drill

Check the diameter of the patellar tendon graft, choose diameter of the drill accordingly and overdrill the drilling wire using the standard cannulated drills.



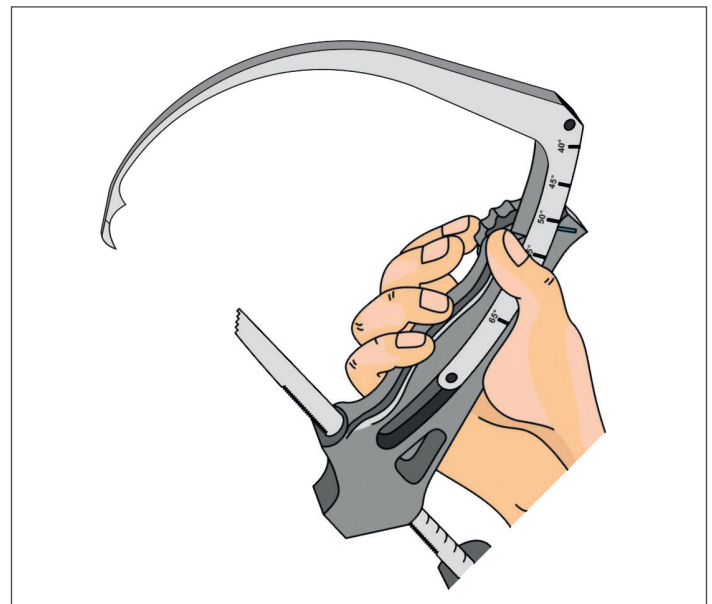
7. The installation of the aiming device for drilling of the femoral tunnel using outside-in technique

Use the handle 129 12 0510 with the aiming arm of PCL Femoral 129 12 0540 for the aiming of the direction and opening of the bone tunnel through the medial condyle of femur.

The angle setting on the scale depends on the height of the working portal, this determines the drilling angle which is usually 60° by the reconstruction of the posterior cruciate ligament.

The angle of the arm does not change during the procedure.

Insert the arm into the groove of the handle, adjust the angle on the scale with the colourful groove on the handle and firmly fix the arm with the handle.



8. The drilling of the femoral tunnel using drilling wire

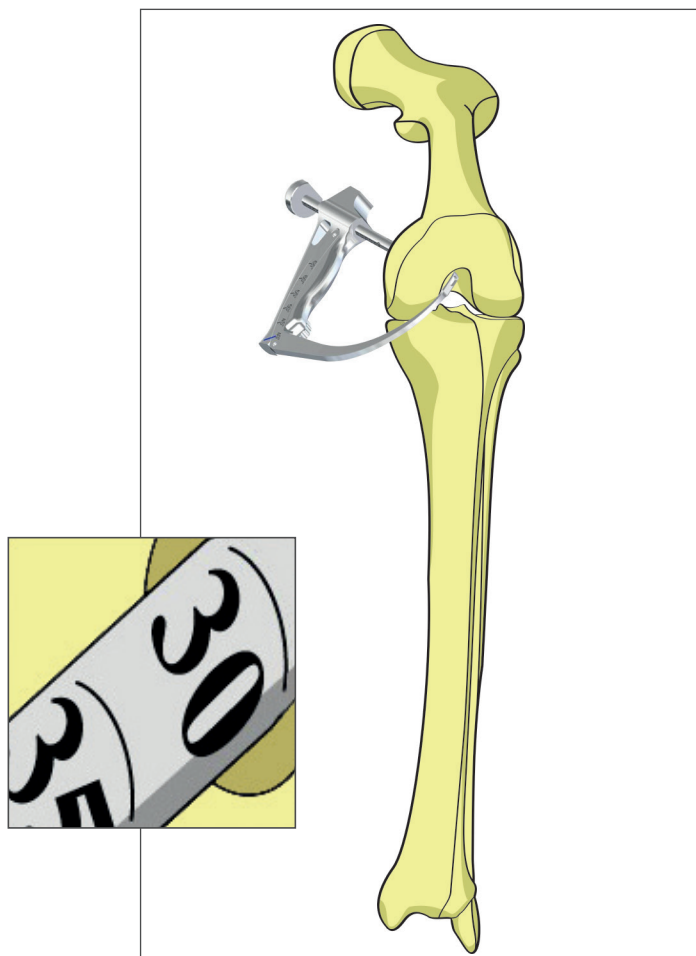
Introduce the aiming arm through the anteromedial portal, hook the front part of the ending approximately 2-3 mm from the joint edge of femur, hook the back spike of the ending approximately 4-5 mm from the joint edge of femur.

Drill the tunnel in femur through the femoral aiming device using the drilling wire of \varnothing 2.4 mm. When introducing the aiming wire it goes through the oval groove between the spikes of the arm ending.

9. The drilling of the femoral tunnel using the inside-out technique

Mark the exact position of the intra-articular opening of the femoral tunnel through the AM portal. It is on about 1.30th hour for the right knee, 5 mm from the edge of the intercondylar fossa, and on 10.30th for the left knee.

Introduce the optics through the AM portal and cannulated guide (the sleeve of the aiming device) through the AL portal. Drill the KI wire into the correct position. Drill the femoral tunnel along the guide wire to the depth of approximately 25-30 mm, the diameter according to the size of the graft.



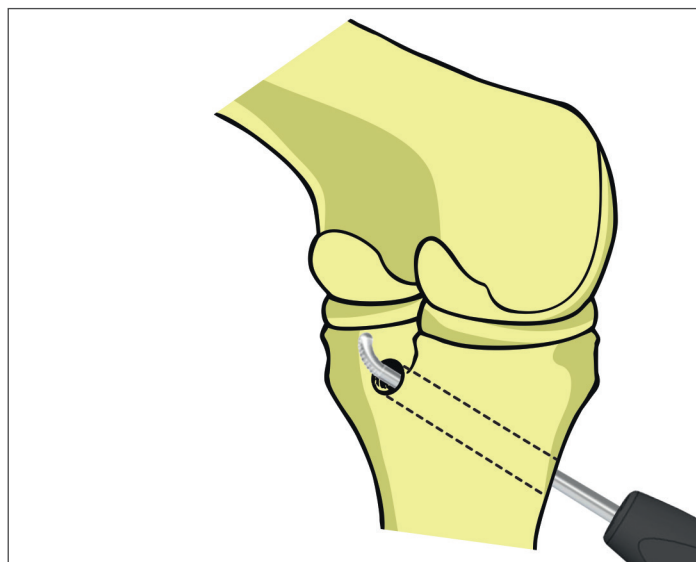
10. The drilling of the femoral tunnel using cannulated drill

Drill a tunnel in the femur with the pre-selected cannulated drill guided by the drilling wire. The depth and the total length of the graft can be measured from the marks on drill.

11. The adjustment of the tunnels

If necessary adjust the drilled holes by the rasp 129 12 0150 or bone file 129 12 0130.

If necessary dilate drilled holes by the dilators of the given diameter 129 12 0630 – 0680.

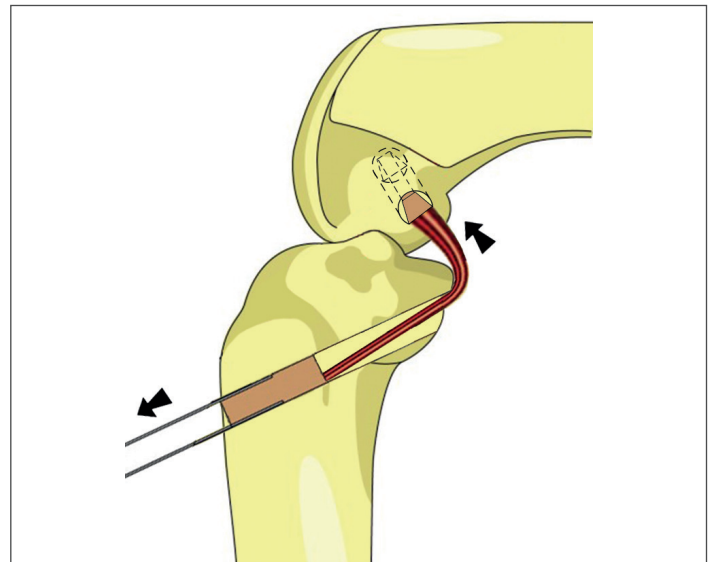
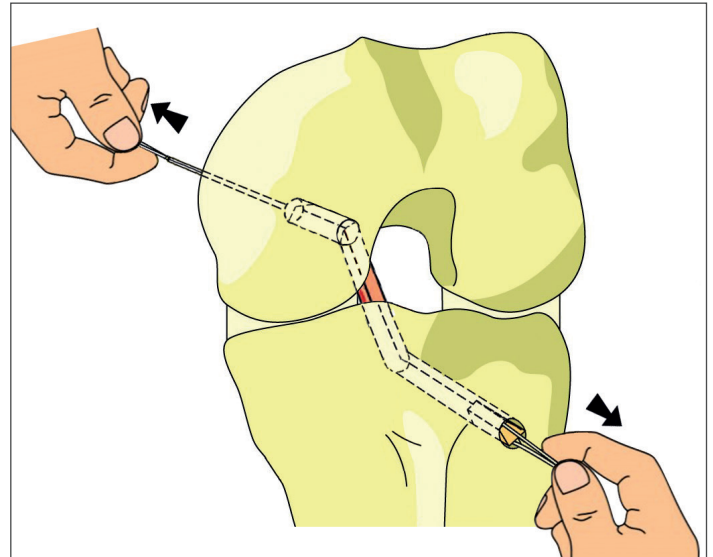


12. The introduction of the graft

Introduce a strong nylon fibre into the tibial tunnel using the wire loop (alternatively the wire loop, too). Introduce it after through intercondylar fossa into the femoral tunnel, too.

It is possible to pull the graft through retrogradely and antegradely. The most difficult location for both methods is pulling along the posterior tibial edge. That's why it is necessary to prepare the bone tunnels and graft for the PCL reconstruction well. When introducing the graft along the posterior tibial edge we use also the tools introduced through the posteromedial portal which make it easier to pull the graft through this difficult place.

The graft has to be introduced into both tunnels correctly.



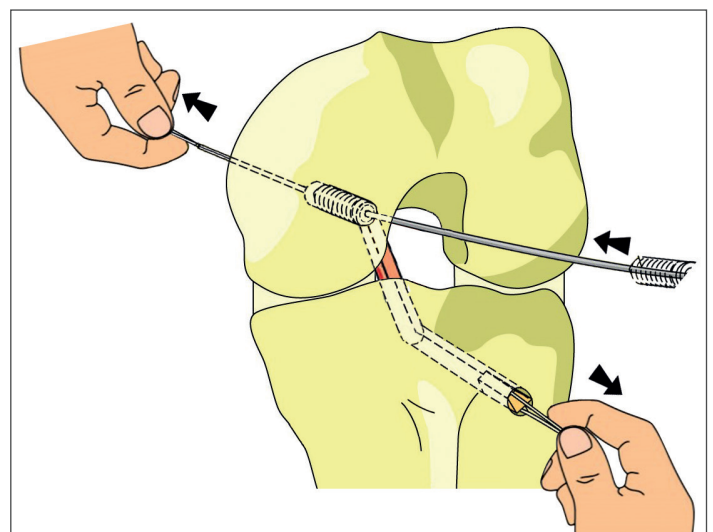
13. The securing of the graft in the femur using an interference screw

First pre-drill a cortical bone along the introduction wire of \varnothing 1 mm 129 12 0690 inserted around the graft in the tunnel using dilator of the bone tunnel of a given diameter 129 12 0630 - 0680 and then fix the graft using interference cannulated screw and tighten securely. It is necessary to keep the graft tighten when introducing the screw. The screw has to fix the graft properly.

Recommended diameter of the cancellous screws is approximately 2 mm smaller than the diameter of the drills used for drilling the tunnel.

The screw has to be introduced antegradely (for the drilling method outside-in) or retrogradely (the drilling method inside-out).

If necessary dilate the opening for the interference screw by dilators of the given diameter 129 12 0630 - 0680.



14. The securing of the graft in the tibia using an interference screw

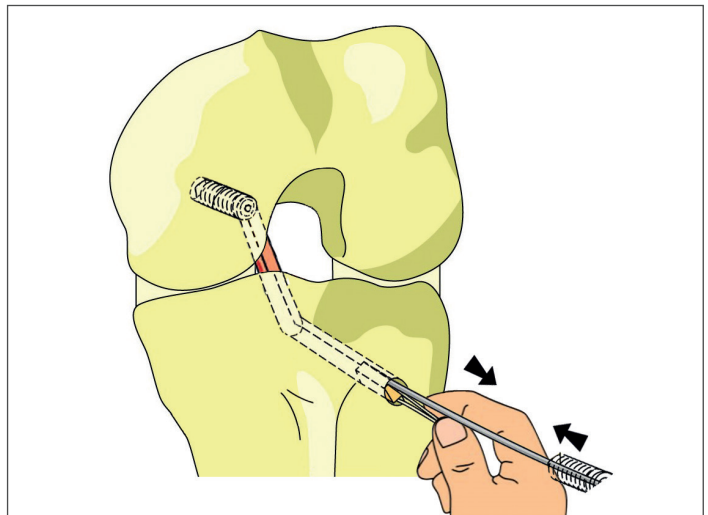
The secured tendon in femur tighten firmly at 60–90 dg. of the knee flexion. Check the isometrics and the graft firmness and the possibility to extend the extremity when the graft is tighten. First pre-drill a cortical bone along the introduction wire of Ø 1 mm 129 12 0690 using dilator of the bone tunnel of a given diameter

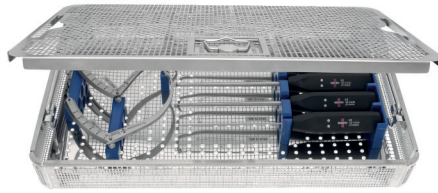
129 12 0630 - 0680 and then introduce the interference screw and firmly tighten together with the bone piece of the patellar tendon.

Try to introduce the screw closely to the cortical bone by the dorsal opening of the tibial tunnel where the bone is most firm (for resorbable or non-metallic screws only)

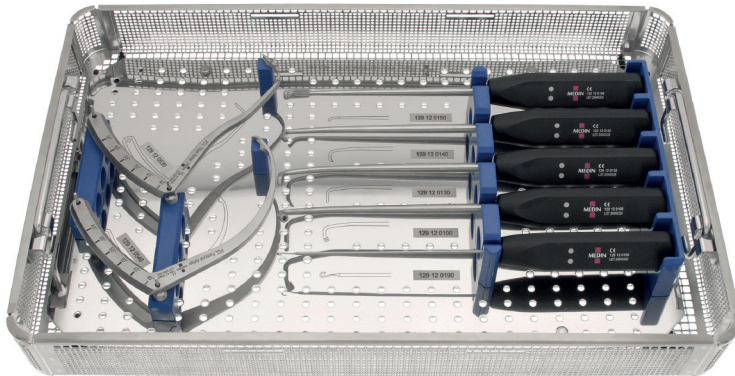
The metallic interference screws should not be introduced deeply into the bone because of potential complications at the revision procedures.

Recommended diameter of the cancellous screws is approximately 2 mm smaller than the diameter of the drills used for drilling the tunnel.





397 139 09 0970 Set for PCL reconstruction



ks/pcs	objednací číslo ordering number	název	name
1	129 12 0100	Chráníč	Protector
1	129 12 0130	Pilník	File
1	129 12 0140	Kyreta	Curette
1	129 12 0150	Rašple	Rasp
1	129 12 0190	Vytahovač vláken	Fiber extractor
1	129 12 0530	Rameno PCL Tibial	PCL Tibial arm
1	129 12 0540	Rameno PCL Femoral	PCL Femoral arm

UPOZORNĚNÍ

K sadě na rekonstrukci PCL je nutno mít výše uvedený set ACL.

NOTICE

Using PCL reconstruction set requires ACL set as well.

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