



LARS<sup>x</sup><sub>TM</sub>

# ACL

Anterior Cruciate Ligament  
Reconstruction and Reinforcement  
Surgical Technique





# LARS™ ACL

Stability / Versatility / Recovery

The next generation in soft tissue internal fixation

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## Operative set-up

Setting of the operative room following the state of the art procedures.

## Notes

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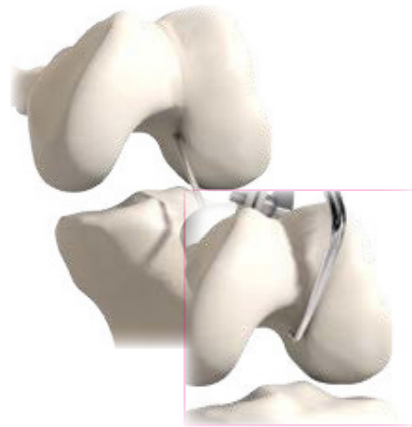
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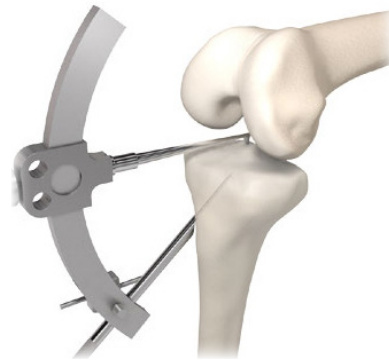
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# LARS™ ACL

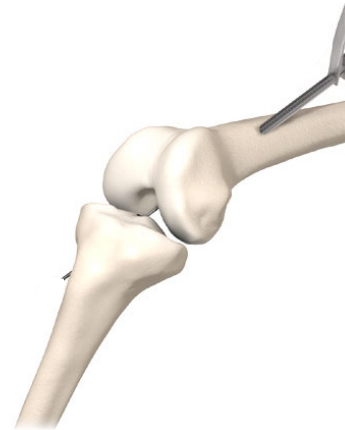
## Surgical Technique Overview



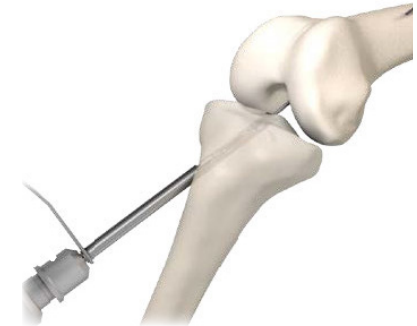
a. Insertion of the k-wire through the femur



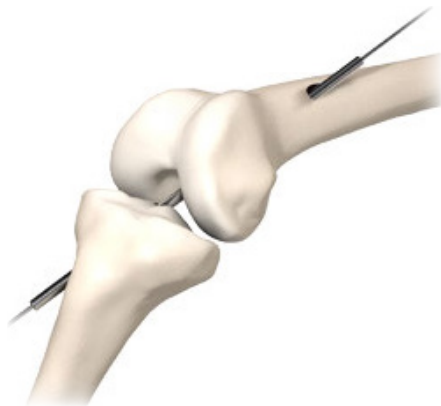
b. Insertion of the k-wire through the femur and the tibia



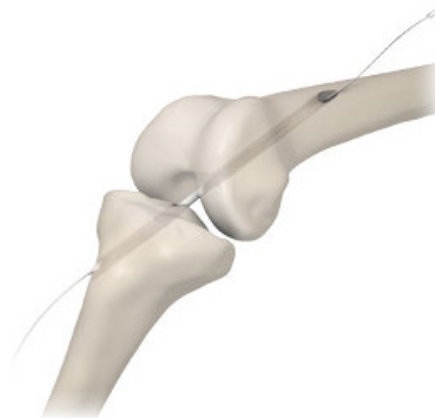
c. Preparation of the femoral and tibial tunnels



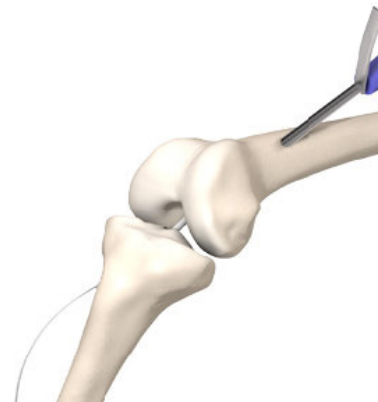
d. Preparation of the tibial tunnel



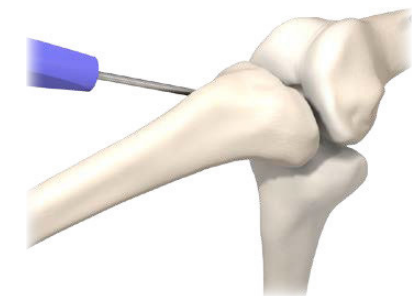
e. Insertion of the long cannula through the femoral and tibial tunnels



f. Insertion of the LARS™

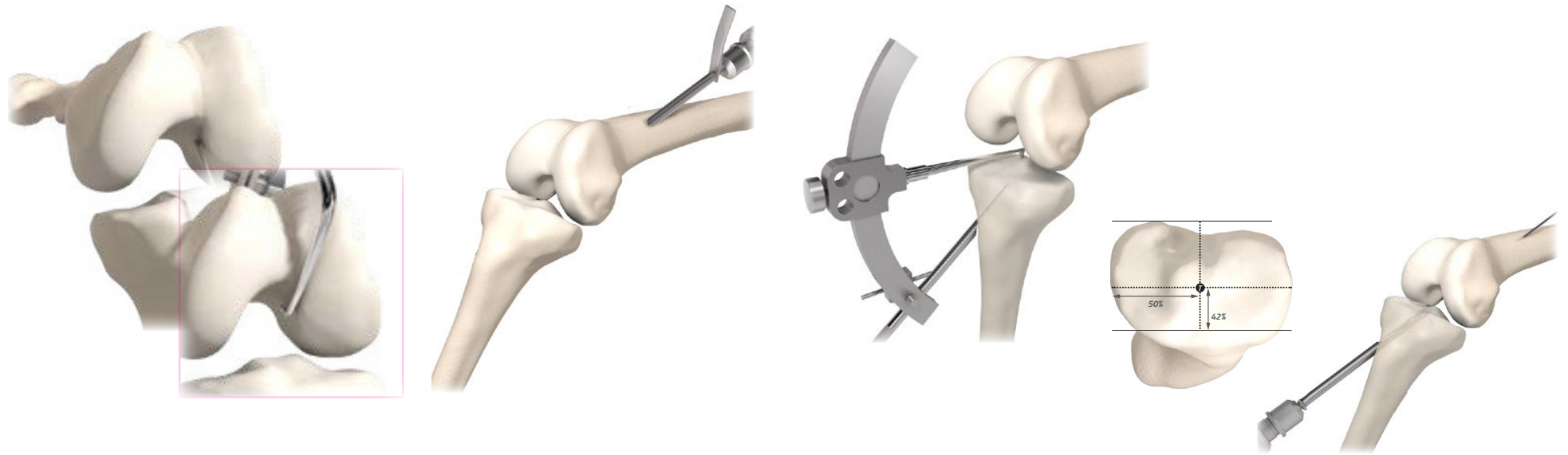


g. LARS™ fixation on the femoral side



h. LARS™ fixation on the tibial side

## Surgical Technique | Independent Anteromedial portal



### Step 1.

#### Femoral tunnel drilling

The target device is assembled with the femoral hook and the K-wire guide; the femoral hook is placed between 50 and 55 on the graduation scale indicated on the target device.

The femoral hook is placed in the middle of the ACL femoral stumps; its tip is gently impacted on the surface of the joint.

The K-wire is drilled through the guide using the outside-in technique. The K-wire guide is disassembled from the target device; the target device is removed first; the k-wire guide is removed by sliding it over the k-wire, while the K-wire is left in place.

The femoral tunnel is prepared by drilling over the K-wire with the cannulated drill bit. The diameter of the drill bit is selected according to the chosen LARS implant. The drill bit is stopped as soon as the surface of the joint is reached to avoid any further damage to the ACL stump.

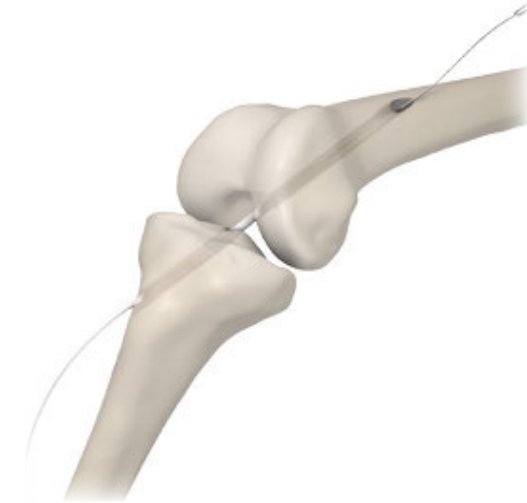
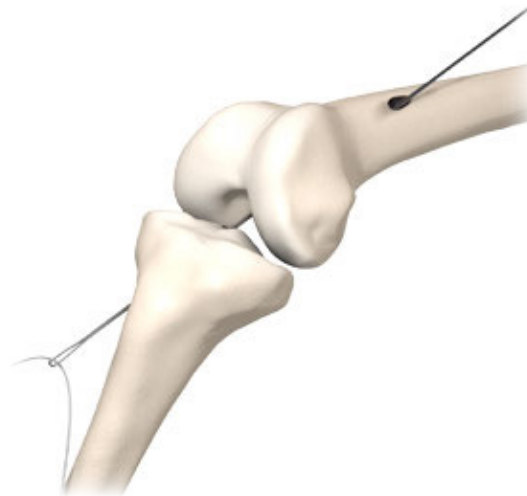
### Step 2.

#### Tibial tunnel drilling

The femoral hook is disassembled from the target device and replaced with the tibial one. The tibial hook is placed parallel to the tibial plateau and its tip is gently impacted at the entry point of the tibial tunnel, identified as point T and corresponding to the insertion of the natural anterior cruciate ligament.

The K-wire is drilled through the guide using the outside-in technique. The K-wire guide is disassembled from the target device which is removed first; the k-wire guide is removed by sliding it over the k-wire, while the K-wire is left in place.

The tibial tunnel is drilled over the K-wire with the same cannulated drill bit previously used. The drill bit is stopped as soon as the surface of the tibial plateau is reached to avoid any further damage to the ACL stump or fibres.



### Step 3. Insertion of the LARS™

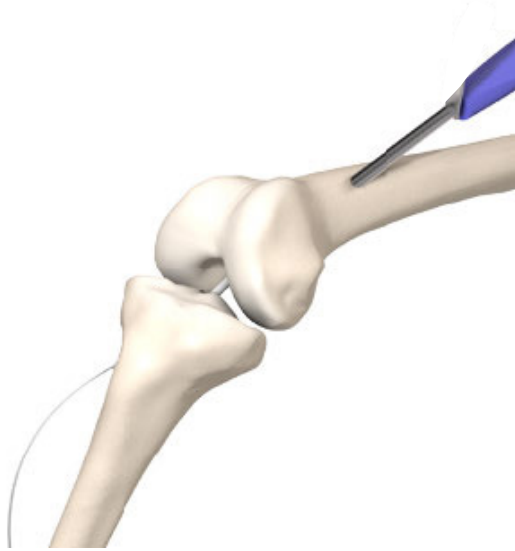
The passing tube is placed through the femoral and tibial tunnel. The K-wire and drilling guide are removed, while the tube is left in place so that it sits in the femur.

A flexible wire loop is inserted from the femoral tunnel, with the loop on the tibial side. The tube connecting the femoral and tibial tunnel is removed pulling it proximally, while the wire loop is kept in place.

The ligament traction wire is passed through the loop of the wire which is then pulled back through, so that the LARS implant is placed in both tunnels. Care must be taken at positioning the intra-articular free fibres: woven fabric must exit the tunnels by 1mm, on both the femoral and tibial side.

If the native ACL has ruptured at the tibial insertion and was sutured, the wire loop may be inserted through the tibial tunnel first and the ligament pulled through the femoral tunnel.

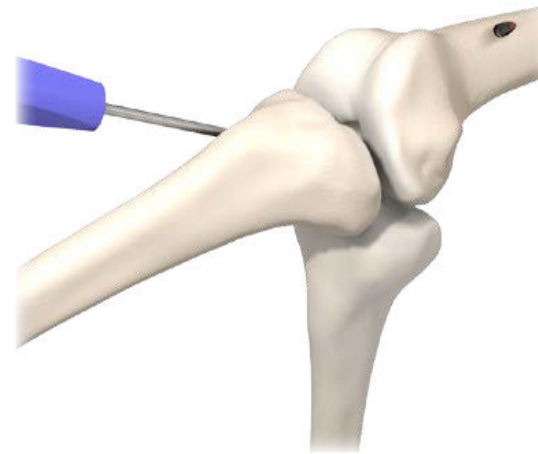




*Step 4.*  
Fixation of the LARS™

Perform first the fixation of the LARS on the femoral side and then on the tibial side. Place the blunt tip k-wire through the tunnel. A LARS™ screw of a diameter of at least 1mm larger than the size of the tunnel is selected.

Place the screw and the screwdriver over the blunt tip; the screw is seated flush with the cortex of the femur.



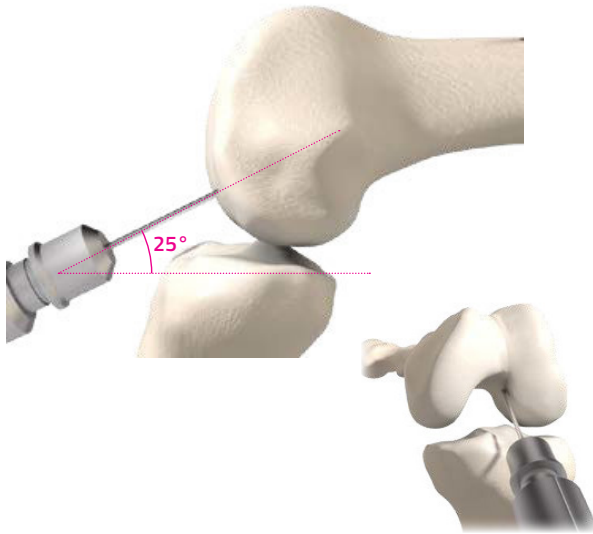
*Step 5.*  
Tibial fixation

Before fixing the LARS™ into the tibial tunnel, the range of motion of the knee is tested several times. The tibial fixation is performed with the knee in a slight flexion (1 to 10°), which allows for fixing the implant at its longest length.

The LARS™ may be observed through the arthroscope, to ensure it may not move.

A secondary fixation may be used to secure the ligament into the tibial tunnel, and it is recommended when the bone is judged of poor quality.

## Surgical Technique | Transtibial

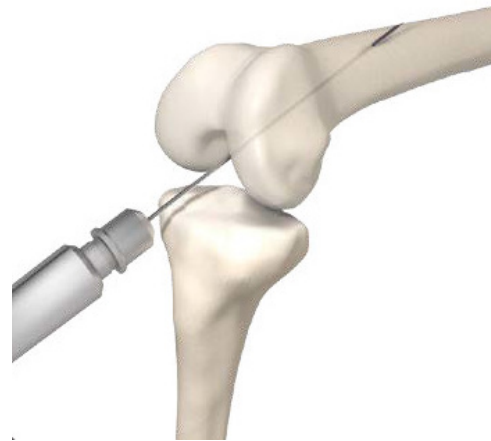


### Step 1.

#### Insertion of the k-wire through the femur

An anterolateral portal for the camera is opened; an anteromedial portal next to the medial border of the patellar tendon and below the level of the tibial plateau is open. Care may be taken to avoid injuring the medial meniscus.

Depending on the surgeon's preference the native ACL is removed or maintained and sutured. If the ACL is resected, care may be taken to preserve its stumps.



Place the knee in a 90° flexion and introduce a sharp double-ended K-wire through the medial portal.

The k-wire is drilled into the bone with approximately a 25° angle with the tibial plateau, while the entry point goes through the ACL stump.

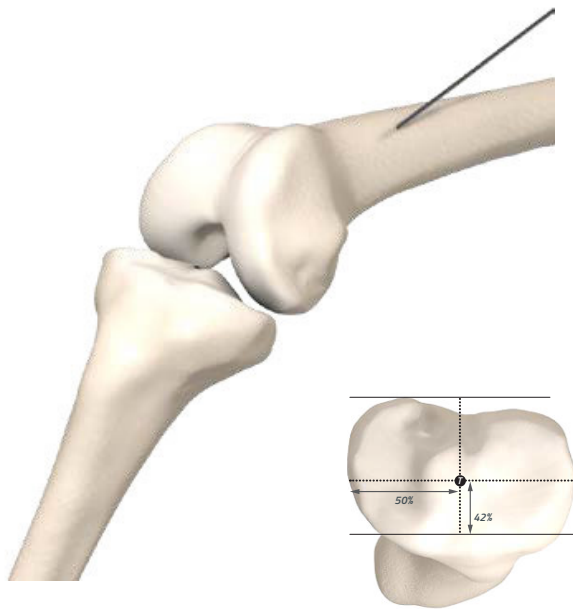
The k-wire is drilled through the antero-lateral cortex, the skin is perforated, and exits over the thigh by about 3 to 5 cm.



The power tool is removed from the distal tip of the k-wire and placed on the proximal one.

The k-wire is pulled back into the intercondylar notch, till it sits flush with the surface of the condyle, so that the knee can be repositioned.

A notchplasty may be performed if a risk of impingement is noticed during surgery.

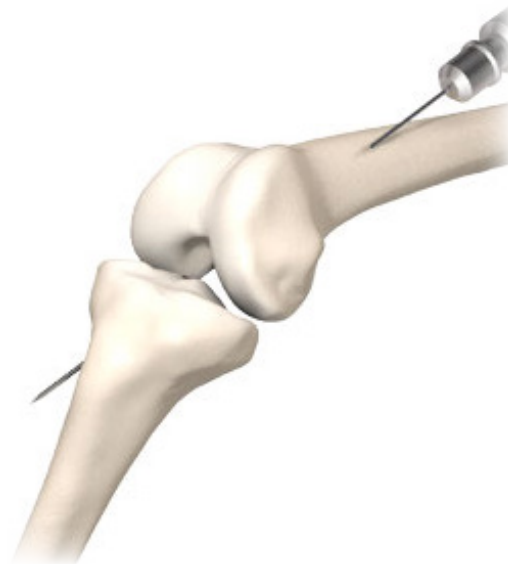


**Step 2.**  
Insertion of the k-wire through the tibia

The knee is now positioned at approximately 50° flexion. Care may be taken to support the leg to avoid the bending of the K-wire when drilling.

The K-wire is drilled into the tibia passing through the centre of the ACL stump, which corresponds to point T.

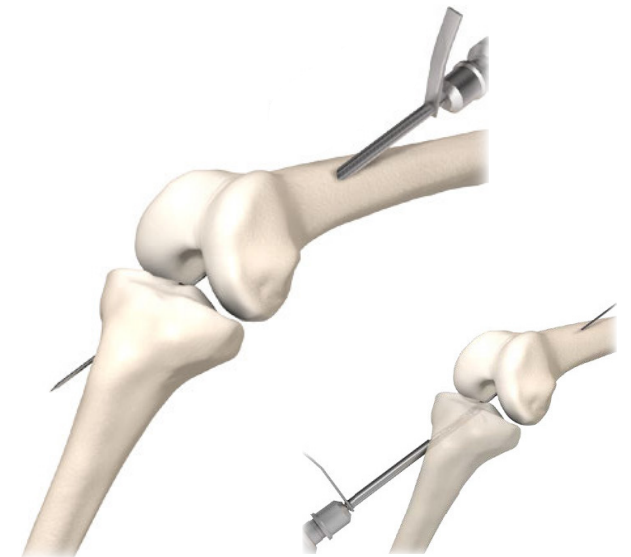
The angle between the K-wire and the tibia plateau is approximately 65°. The K-wire may not impinge the wall of the notch.



The K-wire is passed through the femur, the knee joint, and tibia in a straight line ensuring a perfect alignment of the tunnels. The k-wire protrudes on the tibial side enough to allow for a good guidance of the cannulated drill bit.

This positioning allows for aligning the femur and the tibia as closely as possible in the longitudinal plane, with the knee in a 45-50° flexion when preparing the tunnels.

This alignment ensures an optimal positioning of the synthetic fibres by minimizing their torsion and flexion across the range of motion of the knee.



**Step 3.**  
Preparation of the tunnels

The size of the drill bit is chosen according to the size of the implant. The tunnel is drilled through the femur with an outside-in technique; the drill bit is stopped as soon as the surface of the condyle is reached to avoid any further damage to the ACL stump or fibres.

Prepare the tibial tunnel by drilling over the K-wire with the cannulated drill bits. The drill bit is stopped as soon as the surface of the tibial plateau is reached to avoid any further damage to the ACL stump or fibres.

The LARS™ insertion and fixation are performed as described in the previous surgical technique.

## Reinforcement of an autograft or an allograft with a LARS™

When the anterior cruciate ligament is totally absent or seems of poor quality, it is possible to reconstruct the ACL with an autograft or an allograft and reinforce it with a LARS™.

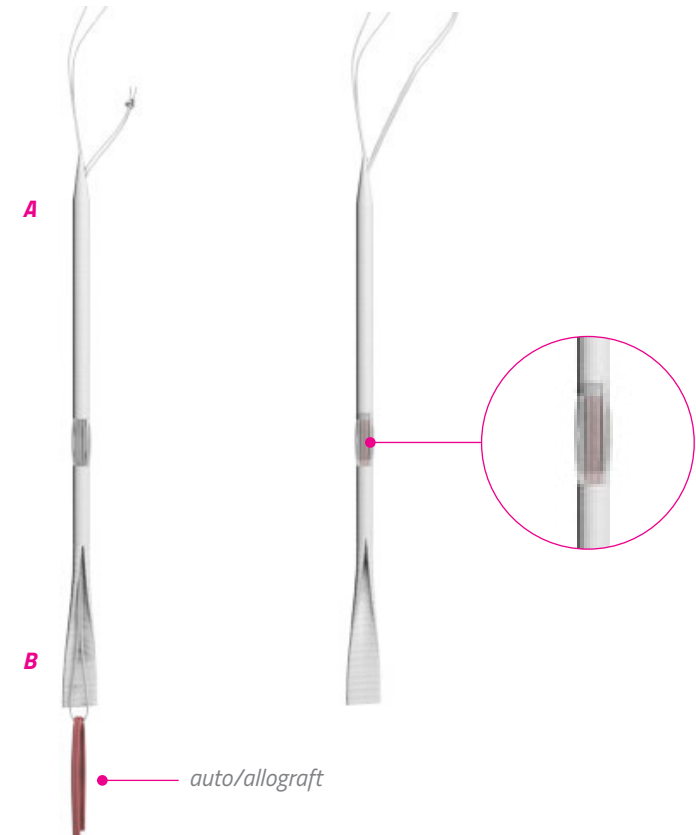
The procedure is realized with the same instrumentation as that used in the techniques described above; the graft and the LARS™ artificial ligament have to be fixed together in the femoral tunnel with LARS™ cannulated ligament screws.

On the tibial side, the graft should be stretched but not the artificial ligament because no discomfort must be created on the biological ligament, only a protection against elongation.

The same fixation techniques described above can be used for the graft and the reinforcement with the LARS™.

### Ordering information

The list of ligaments, fixations and instruments are available in the catalogue VEN/IN.03.



### Hot-dog reinforcement

Shall the surgeon select a reinforcement implant allowing a «hot-dog» reinforcement, the graft is looped to the drawstring looped end (B). The drawstring is pulled on the opposite side (A) through the implant to pass the graft into the reinforcement implant.



## Notes

A series of horizontal dotted lines for taking notes, spanning the width of the page.



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