

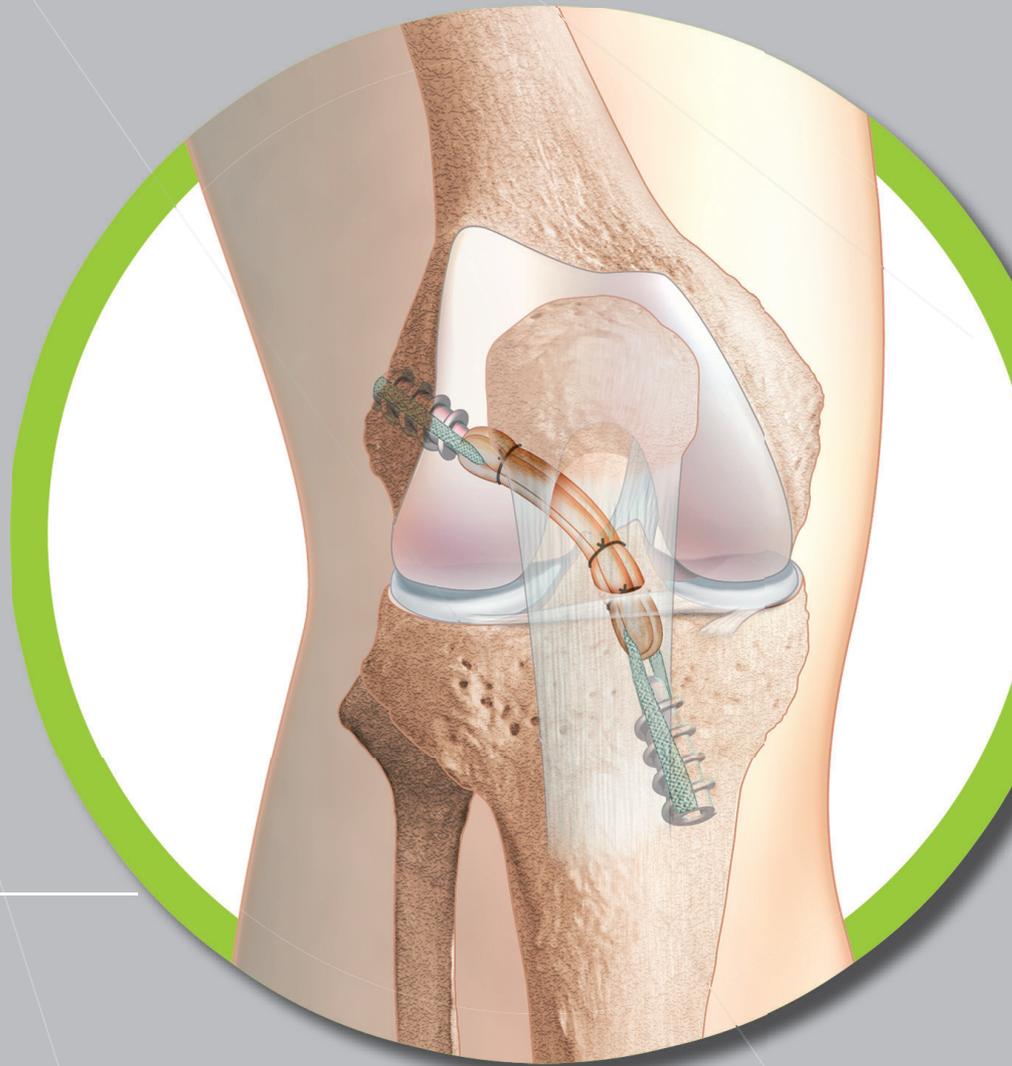
LIGAMENT



TLS[®]

Tape Locking Screw

SURGICAL TECHNIQUE



FH ORTHOPEDICS
quality for health

www.fhorthopedics.com



The TLS® system :

- Only one tendon harvested ;
- Preloaded 4 bundles short graft ;
- Immediate mechanical properties similar to a normal ACL ;
- Atraumatic fixation of the graft ;
- Optimal Secondary fixation : maximum tendon/bone contact (360°) ;
- Post-operative period : no splint, immediate and full weight-bearing, free movement.

TLS®
Tape Locking Screw

Surgical technique



Evaluating the intra-articular length of the graft.

Pre-operative planning (optional)

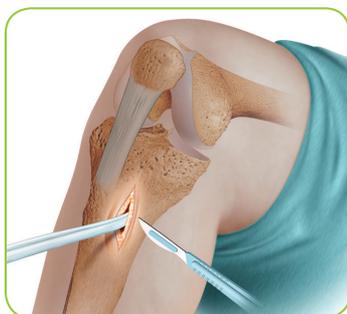
A lateral view X-ray of the knee in extension enables the physician to evaluate the distance between the desired fixation points.

The length of the intra articular path of the transplant is then determined.

Accordingly, the total length of the transplant corresponds to this measurement plus 10 mm for insertion into the femur and 15 mm for insertion into the tibia.

Positioning of the patient

The TLS® technique can be used with any patient positioning that is suitable for ligamentoplasty of the knee.



Harvesting of the semi-tendinosus

Transplant harvesting

In most cases the transplant used is the semi-tendinosus (ST). Sometimes the right gracilis with an appropriate diameter in a relatively tall patient can be used alone in a loop with 4, 5 or 6 strands.



Open stripper - ref 242 049



Preparing the transplant USING THE TLS[®] WORKSTATION

Positioning of the posts on the workstation varies according to the intra-articular size of the transplant.
The posts are generally set at between 50 and 55 mm, depending on the size of the patient.

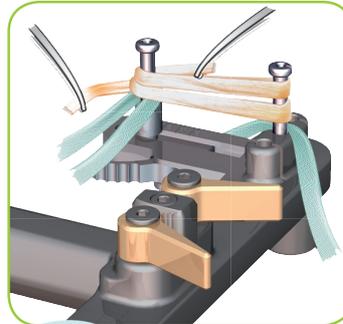
TLS[®] workstation - ref 256 011 + 256 012 + 256 013 + 256 217

A loop with 4 or 5 strands is formed on the workstation (see technical sheet n°4).

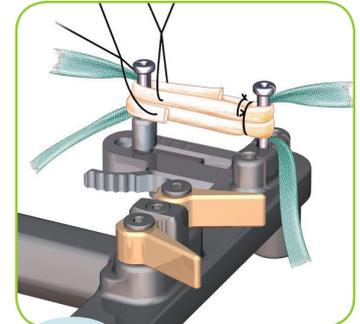
The 4 strands are joined together by means of 3 or 4 cross stitches using woven thread at both ends of the graft.

Sutures of different colours can be used to enable the transplant to penetrate into its bony recesses so as to be checked more easily.

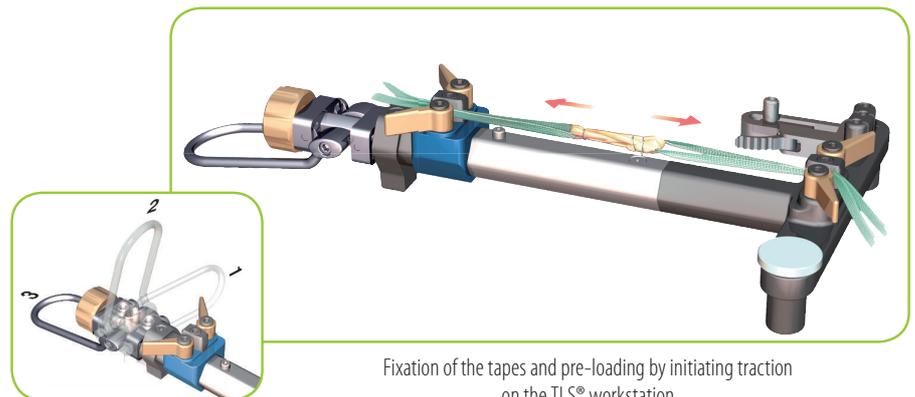
Next the transplant is placed under traction on the TLS[®] workstation by means of its tapes, for 1 minute.



Positioning the tendon in the 4 strand loop and positioning the tapes



Suturing the strands to each other with an X with 4 stitches in an X



Fixation of the tapes and pre-loading by initiating traction on the TLS[®] workstation

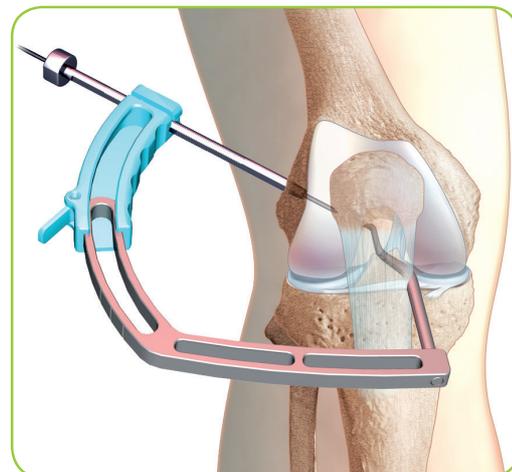
Arthroscopic step Outside-to-inside femoral targeting

The portals are normal : lateral optic and medial instrument tract.
The joint exploration step is standard : there must be careful preparation and cleaning the intercondylar notch.

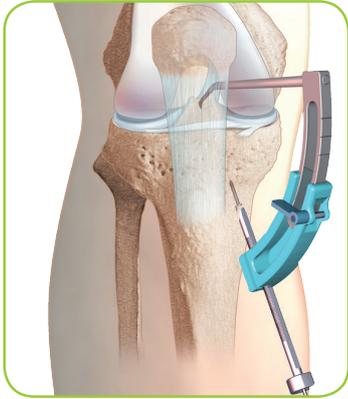
The universal guide provided with the instrumentation makes possible outside-to-inside targeting for both the tibia and the femur.

The guide is first positioned on the femur with the pin forming an approximate angle of 45° with the femoral axis.

Pin Dia 2,4mm - ref 255 994



Positioning the pin. Using the universal ACL femoral guide.
ACL femoral drill guide



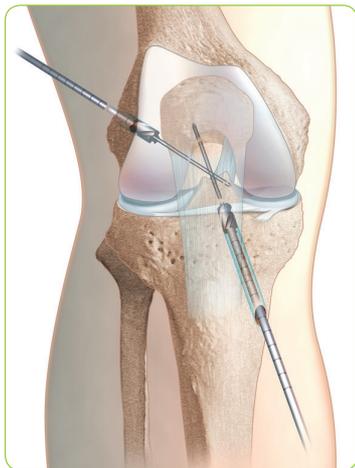
Positioning the pin.
Using the universal guide

Arthroscopic step Outside to inside tibial targeting

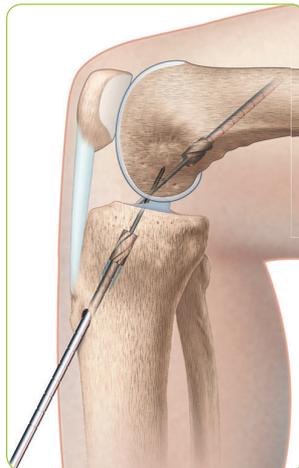
It should be noted that a fairly vertical tunnel (about 60°) is required so as to obtain sufficient tunnel length.

Drilling the tunnels

Tunnelling on 4,5 mm diameter pins is carried out with the drill provided.



Front view

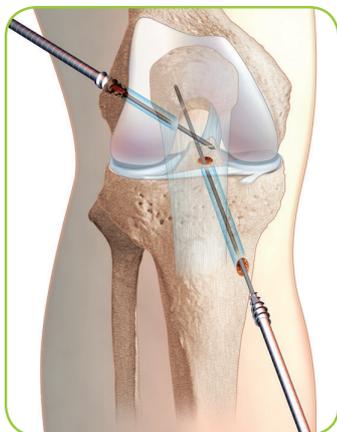


Side view

Drilling the femoral and tibial tunnel



TLS[®] drill - ref 251 262



Tapping the femoral entry



Tapping the tibial entry

Tapping

The entry to the femoral and tibial tunnel is tapped 15 mm in length on the femur and 20 mm in length on the tibia (use the graduated marks on the tapping sleeve to control introduction).



TLS[®] tap - ref 250 105



Retrograde reaming of the cavities

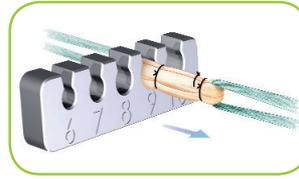
Each end of the transplant is measured with the TLS® calibrator.
TLS® calibrator - ref 255 923

The femoral and tibial recesses are reamed using specific retrograde reamers. Various diameters are provided to drill a space equal to the diameter of the transplant, measured at both ends. Guided on a pin, the retrograde reamers are inserted with a hammer.

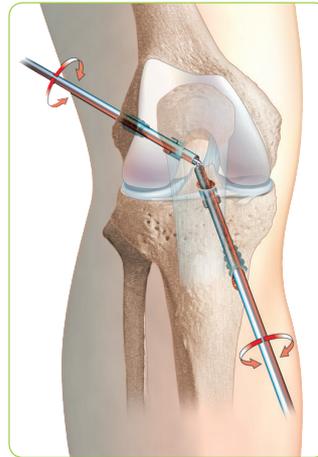


TLS® drills - ref 254 537 or 253 165 or 251 830 or 250 102 or 250 101

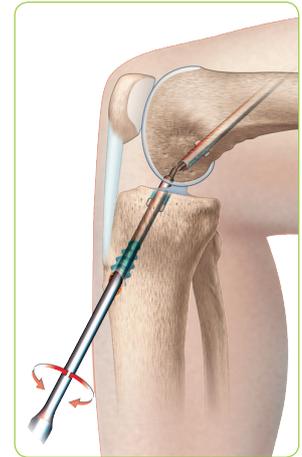
The arthroscope is used to monitor the manual inside-out reaming. This is done first on the tibia, and the hollowing out is carried out just until the tip of the retrograde reamer is showing on the surface of the tibia (tibial recess of 15 mm), and then on the femur until the laser marking (femoral recess of 10 mm). The retrograde reamer is then removed. A TLS® pin guide cannula is screwed into the threaded print over the guide pin, so as to preserve the precise axis of the tunnel.



TLS® calibrator

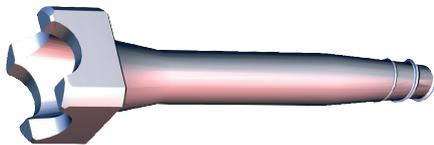


Front view



Side view

Tibial (15 mm) and femoral (10 mm) recesses



TLS® pin guide cannula - ref 255 275

The pin guides are then definitively removed. It is often necessary to clean the entry to the recesses.

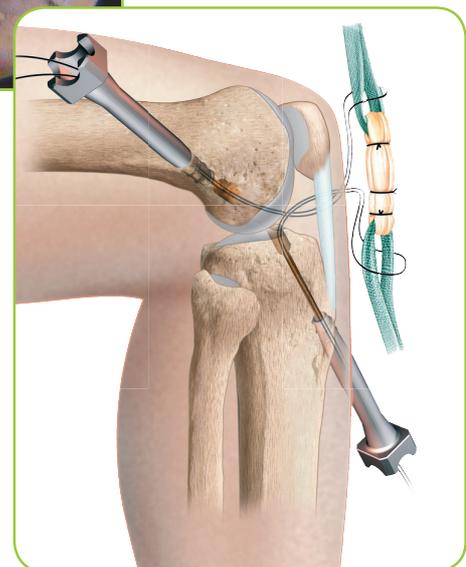


Passing the threads

The medial arthroscopic approach is widened (very important or the graft will not pass across the skin). The traction are passed from the outside to the inside through the femoral and tibial tunnels using the open thread puller provided and are recovered instrumentally using retrieval forceps.



Pulling wire provided with TLS®+ tendon fixation tape - ref 256 193
TLS® wire guide - ref 256 010



Passing the threads from the outside to the inside, and recovering them by means of an antero-medial approach.

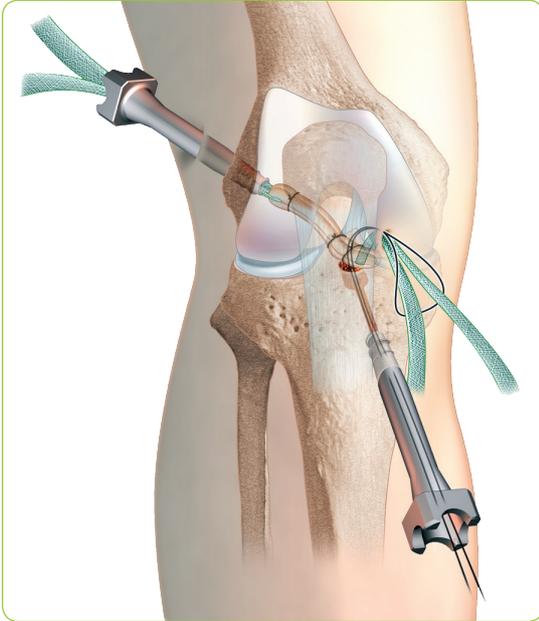


Implanting the graft

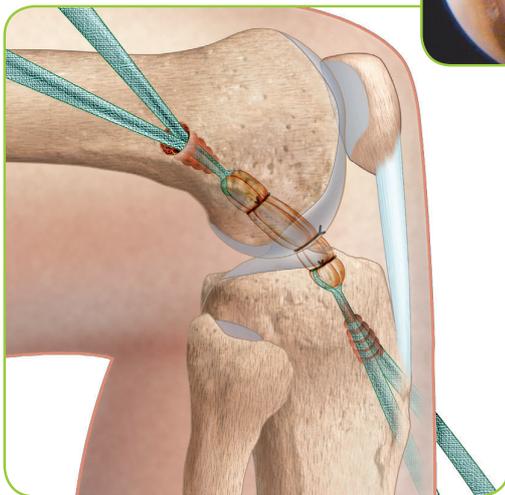
The tapes corresponding to the graft for the femur are passed through in a loop formed by the traction thread. The graft is then pulled automatically positioning itself in the femoral recess. Pulling the tape will automatically position the graft appropriately.

TLS® tendinosus fixation tape - ref 256 193

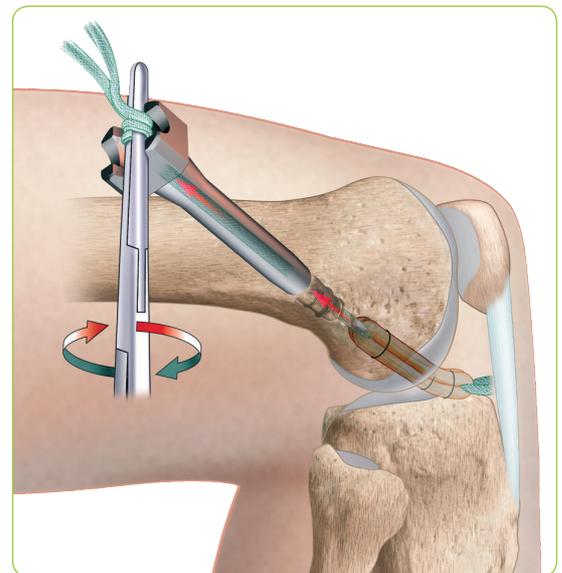
A first "sardine tin key" femoral maneuver at the tip of the cannula makes it possible to press-fit the graft into its recess. The tape corresponding to the tibial tip of the graft is then also passed through a loop in the traction threads just as with the femur. In this way, the graft is put into position. The tibial "sardine tin key" maneuver at the tip of the cannula is performed arthroscopically and makes it possible to verify the good penetration of the graft into its recess.



Recovering the tibial tape



Positioning the graft



Femoral "sardine tin key" maneuver
Verifying the position and adjusting the traction



Fixing INSERTING TLS® SCREWS

The guide pin is positioned in between the two femoral tapes until there is contact between tip of the pin and the transplant.

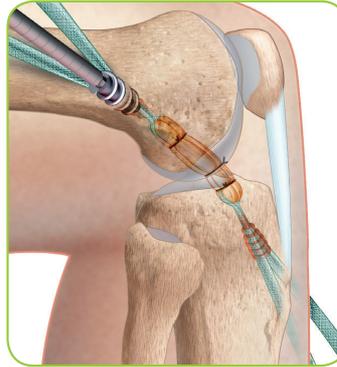
Guide pin for TLS®screw - ref 255 970

The femoral screw is put into position first, with verification of the depth, using the markings on the screwdriver so as not to go beyond contact with the graft.

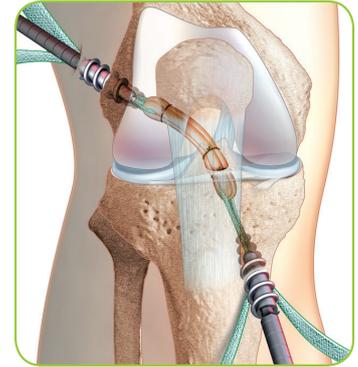


TLS® screwdriver - ref 254 599

Isometry controls are carried out in flexion and extension. Verifying that the graft is at the correct tension can be done by means of a further arthroscopic view. The tibial tapes are secured into position with a pin guide TLS® screw. The tibial screw can then be put into place with the knee in nearly Full extension. Excess tape is cut at the level of the TLS® screws.



Femoral fixation of tapes with screw.
TLS® screw diameter 10 mm - length 20 mm



Putting tibia into traction.
Tibial fixation of ligaments by securing in extension. Tibial screw diameter 10 mm - length 25 mm

Post-operative care

Physiotherapy starts the day following the operation.
Immediate weight-bearing.
Free flexion and extension.
No splint.





TLS® INSTRUMENTATION LIST

FH ORTHOPEDICS ref.

| | |
|---|---------|
| TLS® CONTAINER | 256 008 |
| TLS® SCREWDRIVER 3.5 CANNULA Ø1.8 | 254 599 |
| TLS® TAP | 250 105 |
| TLS® DRILL Ø 4.5 MM | 251 262 |
| PIN FOR TLS® SCREW Ø 1.8 LG 220MM SOFT/SOFT | 255 970 |
| TLS® RETROGRADE REAMER Ø6 | 254 537 |
| TLS® RETROGRADE REAMER Ø7 | 253 165 |
| TLS® RETROGRADE REAMER Ø8 | 251 830 |
| TLS® RETROGRADE REAMER Ø9 | 250 102 |
| TLS® RETROGRADE REAMER Ø10 | 250 101 |
| TLS® PIN GUIDE CANNULA | 255 275 |
| TLS® CALIBRATOR | 255 923 |
| TLS® WIRE GUIDE | 256 010 |
| TLS® COMPACTOR | 256 009 |
| OPEN STRIPPER | 242 049 |
| SCREWDRIVER FOR TLS® PEEK | 263 783 |

TLS® WORKSTATION

FH ORTHOPEDICS ref.

| | |
|-----------------------------|---------|
| TLS® PRE-TENSIONED SCREW | 256 011 |
| TLS® PRE-TENSIONED ASSEMBLY | 256 012 |
| TLS® WORKSTATION | 256 013 |
| TLS® CHOPPING BLOCK | 256 217 |

UNIVERSAL GUIDE LIST

FH ORTHOPEDICS ref.

| | |
|---|---------|
| UNIVERSAL GUIDE CONTAINER | 256 034 |
| TLS® GUIDE PIN Ø 2.4 LG 230MM SOFT/POINTED | 255 994 |
| UNIVERSAL DRILLING HANDLE | 255 693 |
| FEMORAL ANTERIOR CRUCIATE LIGAMENT UNIVERSAL GUIDE | 255 694 |
| TIBIAL ANTERIOR CRUCIATE LIGAMENT UNIVERSAL GUIDE | 255 695 |
| FEMORAL POSTERIOR CRUCIATE LIGAMENT UNIVERSAL GUIDE | 255 696 |
| TIBIAL POSTERIOR CRUCIATE LIGAMENT UNIVERSAL GUIDE | 255 697 |
| UNIVERSAL GUIDE HANDLE ASSEMBLY | 255 698 |
| UNIVERSAL GUIDE DOUBLE TUNNEL ASSEMBLY | 255 699 |

PRODUCT REFERENCE

TLS® TENDON FIXATION SYSTEMS

FH ORTHOPEDICS ref.

| | |
|---|---------|
| TLS® TENDON ANCHORING SCREW Ø 10 MM LG 20 MM | 253 569 |
| TLS® TENDON ANCHORING SCREW Ø 10 MM LG 25 MM | 248 853 |
| TLS® TENDON ANCHORING SCREW Ø 12 MM LG 20 MM | 264 274 |
| TLS® TENDON ANCHORING SCREW PEEK Ø 10 MM LG 20 MM | 263 653 |
| TLS® TENDON ANCHORING SCREW PEEK Ø 10 MM LG 25 MM | 263 654 |
| TLS® + TENDON ANCHORING TAPE | 256 193 |

TLS®

Tape Locking Screw

TLS® Classic is under permanent evaluation by the members of the GRAAL Group of GECCO, a study group for ligament knee surgery. (www.gecco-medical.org)

GECCO



TLS® work station



Universal guide



TLS® tendinous fixation screw



TLS® tendinous fixation tape

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