

LISS

Dynamic Hip and Condylar
System

Surgical Technique



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Warning This instruction is for reference only.
Operation must be performed under the guides of professional doctors.

CanLISS Introduction

Compared with conventional surgical technique, such constructs of plate and locking screws provide more preservation of bone blood supply and provide advantages such as closed, indirect reduction techniques. With special designed instruments and insertion guide the locking plate can be inserted under muscles; each Locking screw can be inserted with the help of accurate guide targeting through stab incision. Less invasive locking plates provide atraumatic insertion technique, minimal bone contact more preservation of bone blood supply in full accordance with MIPPO principles (Minimally Invasive Percutaneous Plating (Osteosynthesis)).

CanLISS Indications

Indications of distal femur plate

- Distal femoral diaphysis fractures
- Distal femoral extra-articular fractures
- Distal femoral intra-articular fractures
- Periprosthetic fractures

Indications of proximal tibia plate

- Proximal tibia diaphysis fractures
- Proximal tibia extra-articular fractures
- Proximal tibia intra-articular fractures
- Periprosthetic fractures

CanLISSContraindications

- Active infection
- Lack of bone substance which makes stable seating of the implant impossible
- Allergy to the implant material
- Patient conditions including blood supply limitations and insufficient quantity or quality of bone
- Patient with mental or neurologic conditions who are unwilling or incapable of following postoperative care instructions during the healing process

CanLISSFeatures & Benefits

- Anatomically contoured plates allow for reduced or time facilitate better soft tissue coverage and help to confirm axial alignment
- Designed for MIPO technique using state of the art instrumentation
- Radiolucent targeting arm provides precise fit between targeting holes and sleeves for accurate screw placement

CanLISS Surgical Technique for Distal Femur

Step1. Pre-operative planning

Use X-ray radiographs to determine the length of the plate and position of the screws.

Step2. Patient positioning

Place the patient in the supine position and allow the leg to move freely. Flex the knee approximately 40° to reduce the forces of the gastrocnemius muscle.

Step3. Incision

1. Lateral incision (Fig. 1)

A lateral incision is recommended when a simple articular or supracondylar fracture is present. The skin incision starts at the Gerdy's Tubercle and extends about 80mm in a proximal direction.

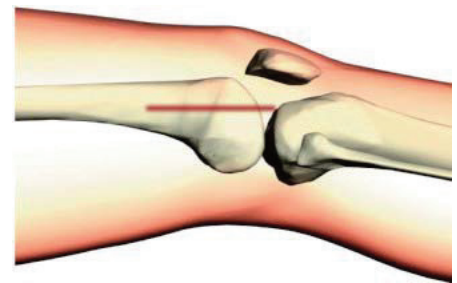


Fig. 1

2. Lateral parapatellar incision (Fig. 2)

In the presence of a complex intra-articular fracture perform a lateral parapatellar approach. This incision provides an adequate exposure of the joint for reduction and anatomic fixation. Open the space between the vastus lateralis muscle and the periosteum and insert the plate.

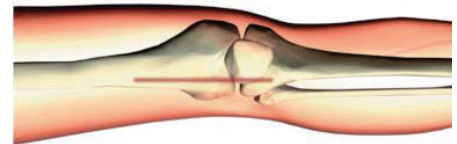


Fig. 2

Step4. Reduction

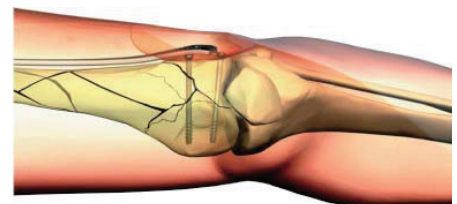
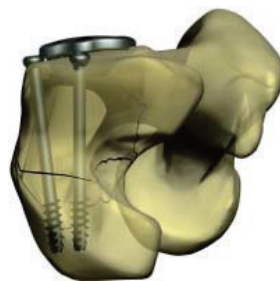


Fig. 3

CanLISS Surgical Technique for Distal Femur

Step5. Instrument assembly

1.Assemble the Insertion Guide for Distal Lateral Femur (Fig. 4).

Instruments:

113400018	Insertion Guide for Distal Lateral Femur	Right
113400019	Insertion Guide for Distal Lateral Femur	Left

2.Insert the fixation bolt through hole (Fig. 5).

3.Assemble the insertion guide correspondingly to the three-point on the plate (Fig. 6).

Instruments:

113400011	Fixation Bolt	
113400018	Insertion Guide for Distal Lateral Femur	Right
113400019	Insertion Guide for Distal Lateral Femur	Left

4. Tighten the fixation bolt (Fig. 7)

Instruments:

113400011	Fixation Bolt
113400012	Stablilization Bolt
113400005	Insertion Sleeve

5. If desired insert the stabilization bolt with sleeve into hole. This offers greater stability and reduces resistance from soft tissue during insertion.



Fig. 4



Fig. 5

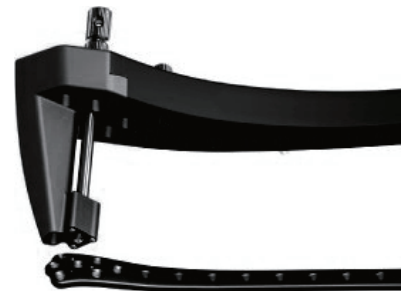


Fig. 6



Fig. 7

CanLISS Surgical Technique for Distal Femur

Step 6. Plate insertion

1. Insert the plate.

Insert the plate in a proximal direction between the vastus lateralis muscle and the periosteum (Fig. 8). Keep the plate in constant contact with the bone during insertion.

Note: The insertion guide may interfere with the soft tissue when using long plate or in large patients. In such cases remove the proximal portion of the guide.

2. Check plate orientation.

Due to its weight, the insertion guide has a tendency to rotate external. Internally rotate the guide approximately 10° to the femoral shaft (Fig. 9), so as to position the guide properly on the condyle.

3. Confirm position of the proximal end of plate.

Confirm proper position of the proximal end of the plate with lateral X-ray. The proximal screws must be positioned through the center of the intramedullary canal.

4. Preliminary fixation of the distal end of plate.

Insert a 2.0 K-wire through the cannula of the fixation bolt in hole A (Fig. 10), and ensure that the K-wire should be parallel to the knee joint.

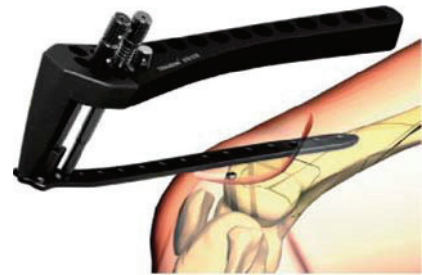


Fig. 8

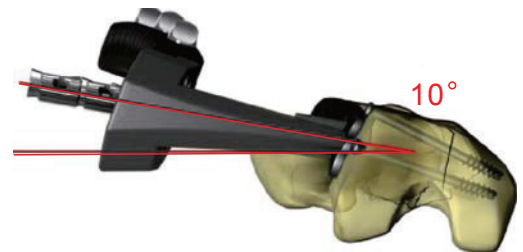


Fig. 9

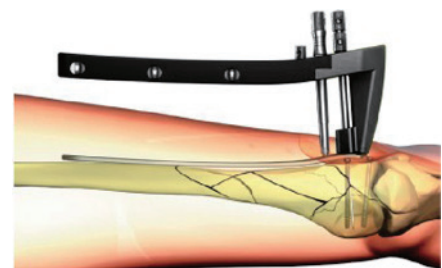


Fig. 10

CanLISS Surgical Technique for Distal Femur

5. Insert stabilization bolt into the proximal plate hole, Make an incision at the most proximal plate hole, insert the sleeve and trocar onto the bone. Secure the sleeve by tightening the nut on the guide side. Remove the trocar and thread the stabilization bolt into the proximal plate hole (Fig. 11).

Instruments:

113400005	Insertion Sleeve
113400006	Kirschner Wire Insertion Sleeve

6. Preliminary fixation of the proximal end of plate.

Insert a K-wire through the cannula of the stabilization bolt (Fig. 12), check the plate position and reduction with X-ray.

Instruments:

113400016	K-Wire with Threaded Tip
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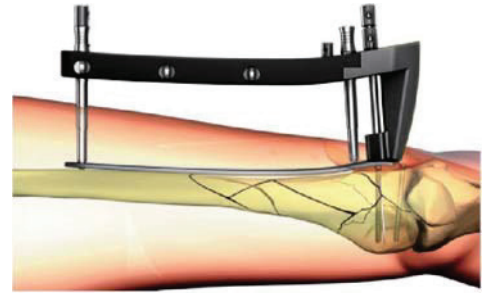


Fig. 11

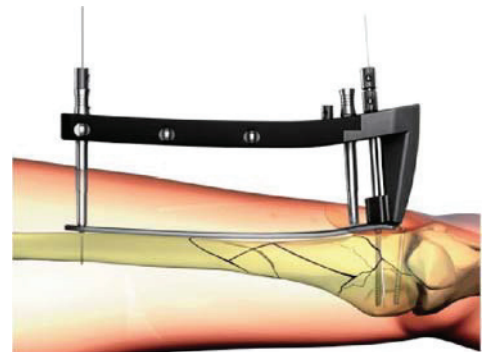


Fig. 12

Step7. Use of pull reduction instrument

In the situation of dealing with dense cortices or lacking stabilization, it is recommended to use pull reduction instrument to prevent the bone fragments movements during the insertion of the first locking screw. Moreover, the pull reduction instrument can also be used for translational adjustments.

CanLISS Surgical Technique for Distal Femur

Steps of using pull reduction instrument (Fig. 13)

1. Create a stab incision and insert the sleeve.
2. Insert the pull reduction instrument by power tool (Use irrigation and cooling during drilling to minimize thermal necrosis).
3. Tighten the nut until the desired reduction is achieved while Monitoring progress under X-ray imaging. The instrument is smaller in diameter than the locking screw. Therefore, it allows later placement of locking screw with no interrupt of stabilization.

Instruments:

11340009	Pull Reduction Instrument
11340005	Insertion Sleeve

Step8. Insertion of locking screws

Steps if locking screw insertion

1. Insert trocar through sleeve.
2. Make a stab incision insert the sleeve with trocar to the plate.
3. Select a locking screw with proper length attach it to the hexagonal screwdriver shaft. Insert the screw by power tool (Fig.14). Use irrigation and cooling during drilling to minimize thermal necrosis.
4. Use the torque limiting screwdriver for the final tightening, and insert other screws the same procedures (Fig.15).

- Note:
- Never use power tool for the screw final tightening.
 - Ensure that no soft tissue is interposed between the screw and plate hole. Otherwise it will cause loss of fixation ability.
 - Ensure that screws are centered on the bone shaft for adequate purchase in bone.

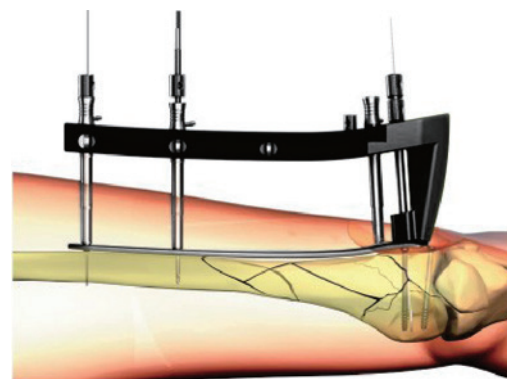


Fig. 13

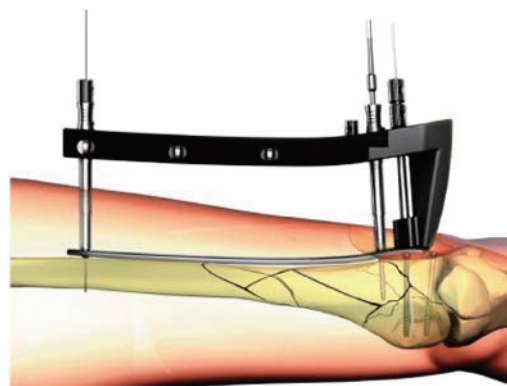


Fig. 14

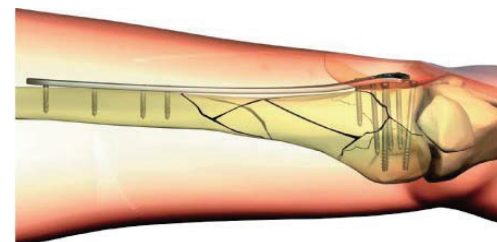


Fig. 15

CanLISS Surgical Technique for Distal Femur

Insert a locking screw or screw hole insert for hole A

The fixation bolt in hole A functions as the connection between the guide and plate therefore hole A must always be the final hole for screw insertion. If a locking screw is not planned for hole A it is recommended that a screw hole insert be inserted. This ensures that the guide be reattached for implant removal.

Hole A screw insertion

Before removing the fixation bolt place the stabilization bolt with sleeve in one open hole. Remove the fixation bolt insert it in adjacent open hole. Place sleeve in hole A and then insert locking screw.

Step9. Postoperative Treatment

Postoperative treatment with distal femur plate is the same as conventional AO intimal fixation procedures. Basic function treatment includes free motion of knee joint and partial weight bearing. Physical treatment should begin soon after the surgery , however restriction may be appropriate in special cases.

Step10. Implant Removal

Remove the implant only after complete consolidation of the fracture.

Make incision for guide installation. Make stab incisions and remove all screws.

After explantation of all screws remove the plate.

Note: Use the cleaning instrument to remove tissue from the hexagonal socket of screws and ensure the screw driver securely snap into place.

Loosen each screw before the explanation of screws.

CanLISS Surgical Technique for Proximal Tibia

Step1. Pre-operative planning

Use X-ray radiographs to determine the length of the plate and position of the screws.

Step2. Patient positioning

Place the patient in the supine position and allow the leg to move freely so as to facilitate X-ray images. A bump under the patient's knee would help to flex the knee joint.

Step3. Incision

Incision should be appropriate for the surgery demand. A conventional incision starts at the Gerdy's tubercle and extends in a distal direction (Fig.1).

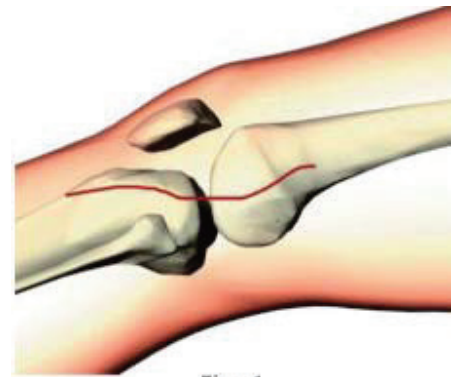


Fig. 1

Step4. Instrument assembly

Articular fracture reduction must be complete prior to placement of the plate. Perform standard reduction and fixation of the articular surfaces by obtaining anatomic reduction and fixation with individual lag screws (Fig. 2). Place lag screws peripherally so as not to interfere with locking screws placement

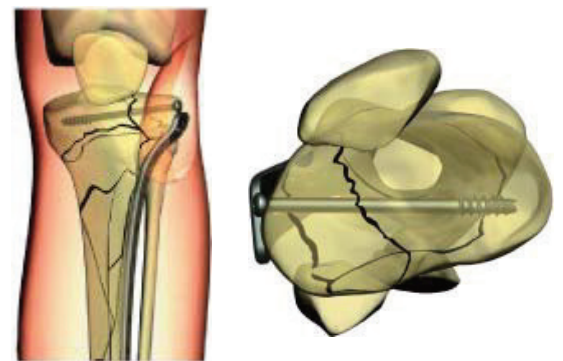


Fig. 2

CanLISS Surgical Technique for Proximal Tibia

1. Assemble the proximal tibia insertion guide (Fig. 3)

Instruments:

113400022	Insertion Guide for Proximal Tibia	Right
113400023	Insertion Guide for Proximal Tibia	Left

2. Insert the fixation bolt through hole (Fig. 4).

3. Assemble the insertion guide correspondingly to the three-point on the plate (Fig. 5).

Instruments:

113400011	Fixation Bolt
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4. Tighten the fixation bolt (Fig. 6).



Fig. 3A



A Fig. 4



Fig. 5



Fig. 6

CanLISS Surgical Technique for Proximal Tibia

Step 5. Plate insertion

1. Insert the plate.

Insert the plate in a distal direction between the anterior tibialis muscle and the periosteum. Keep the plate in constant contact with the bone during insertion (Fig. 7).

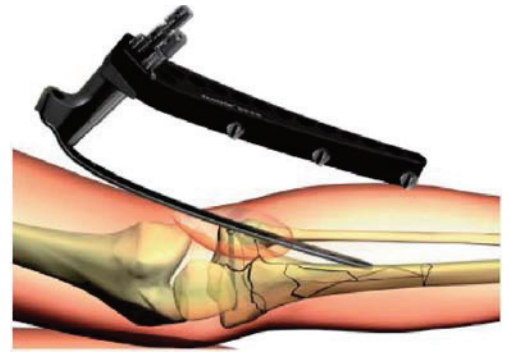


Fig. 7

2. Check plate orientation

Confirm proper position of the plate. The distal end of the plate should be positioned at the anterior and lateral side along tibia crest and the proximal end of the plate should be positioned at late condyle. The plate should be properly positioned on the lateral condole of tibia.

3. Preliminary fixation of the proximal end of plate.

Insert a 2.0 K-wire through the K-wire hole to provide preliminary fixation of the proximal end of the plate (Fig. 8)

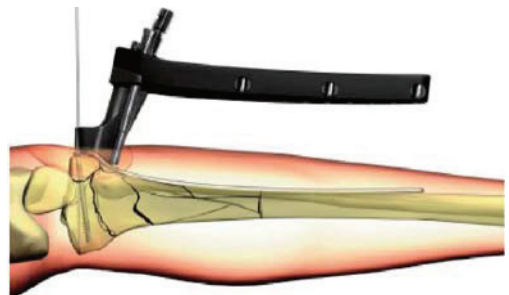


Fig. 8

Instruments:

113400016	K-Wire with Threaded Tip
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4. Insert stabilization bolt into the distal plate hole.

Make an incision at the most distal plate hole insert the sleeve and trocar onto the bone. Secure the sleeve by tightening the nut on the guide side. Remove the trocar and thread the stabilization bolt into the distal plate hole (Fig. 9).

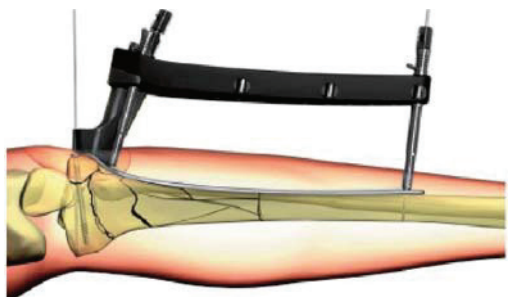


Fig. 8

Instruments:

113400005	Insertion Sleeve
113400006	Kirschner Wire Insertion Sleeve

5. Preliminary fixation of the distal end of plate.

Insert a K-wire through the cannula of the stabilization bolt (Fig. 10), check the plate position and reduction with X-ray.

Instruments:

113400016

K-Wire with Threaded Tip

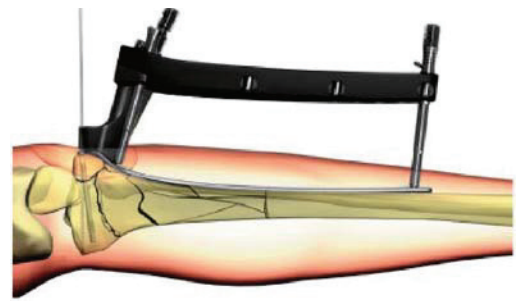


Fig. 10

Step6. Use of pull reduction instrument

In the situation of dealing with dense cortices or lacking stabilization, it is recommended to use pull reduction instrument to prevent the bone fragments movements during the insertion of the first locking screw. Moreover, the pull reduction instrument can also be used for translational adjustments.

Steps of using pull reduction instrument (Fig. 11)

1. Create a stab incision and insert the sleeve.
2. Insert the pull reduction instrument by power tool (Use irrigation and cooling during drilling to minimize Thermal necrosis).
3. Tighten the nut until the desired reduction is achieved while monitoring progress under X-ray imaging. The instrument is smaller in diameter than the locking screw, therefore, it allows later placement of locking screw, Confirm proper position of the plate. The distal end of the plate should be positioned at the anterior and lateral side along tibia crest and the proximal end of the plate should be positioned at late condyle. The plate should be properly positioned on the lateral condole of tibia with no interrupt of stabilization.

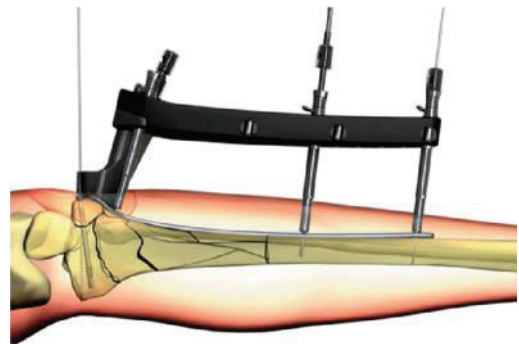


Fig. 11

CanLISS Surgical Technique for Proximal Tibia

Step7. Insertion Of Locking Screws

Steps of locking screw insertion

1. Insert trocar through sleeve.
2. Make a stab incision insert the sleeve with trocar to the plate.
3. Select a locking screw with proper length attach it to the hexagonal screwdriver shaft. Insert the screw by power tool (Fig. 12). Use irrigation and cooling during drilling to minimize thermal necrosis.

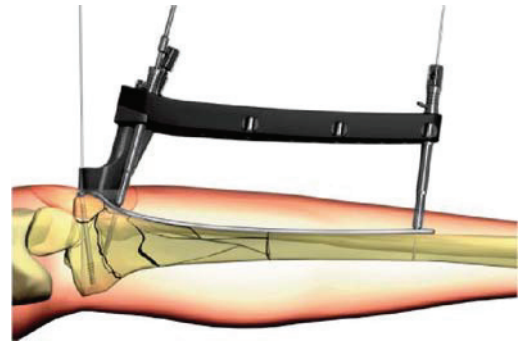


Fig.12

4. Insert other screws the same procedures (Fig. 13).

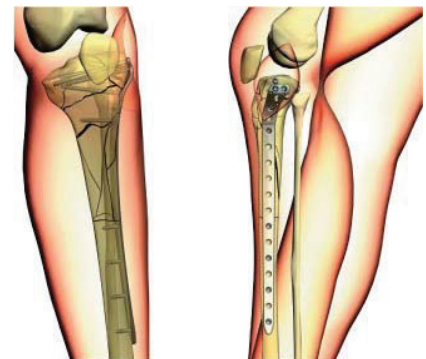


Fig.13

Note: -Never use power tool for the screw final tightening.

-Ensure that no soft tissue is interposed between the screw and plate hole, otherwise it will cause loss of fixation stability.

-Insert a locking screw or screw hole insert for hole A.

-The fixation bolt in hole A functions as the connection between the guide and plate therefore hole A must always be the final hole for screw insertion. If a locking screw is not planned for hole A It is recommended that a screw hole insert be inserted. This ensures that the guide be reattached for implant removal.

CanLISS Surgical Technique for Proximal Tibia

Step8. Hole A screw insertion

Before removing the fixation bolt place the stabilization bit with sleeve in one open hole. Remove the fixation bolt and place sleeve in hole A and then insert locking screw.

Step9. Postoperative treatment

Postoperative treatment with distal femur plate is the same as conventional AO internal fixation procedures. Basic function treatment includes free motion of knee joint and partial weight bearing.

Physical treatment should begin soon after the surgery; however, restriction may be appropriate in special cases.

Step9. Postoperative treatment

Postoperative treatment with distal femur plate is the same as conventional AO internal fixation procedures. Basic function treatment includes free motion of knee joint and partial weight bearing.

Physical treatment should begin soon after the surgery; however, restriction may be appropriate in special cases.

Step10. Implant removal

Remove the implant only after complete consolidation of the fracture.

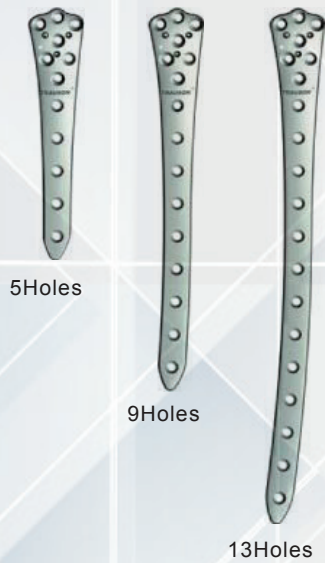
Steps of implant removal

1. Make incision for guide installation. Make stab incisions and remove all screws.
2. After explantation of all screws remove the plate

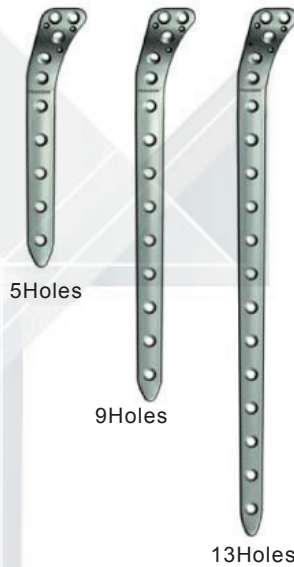
Note:-Use the cleaning instrument to remove tissue from the hexagonal socket of screws and ensure the screwdriver Securely snap into place.

-Loosen each screw before the explanations of screws

CanLISSImplants



Less Invasive Distal Femur Locking Plate



Less Invasive Proximal Tibia Locking Plate



Self-drilling Locking Screw

CanLISSInstruments



Insertion Guide for Distal Lateral Femur (Left/Right)



Insertion Guide for Proximal Tibia (Left/Right)



Stabilization Bolt



Insertion Sleeve



Fixation Bolt



Kirschner Wire Insertion Sleeve



Ø4.3 Drill Guide



Pin Wrench



Torque Limiter



Pull Reduction Instrument



Hexagonal Screwdriver Shaft



Measuring Device



Trocar



Cleaning Instrument
For Screws



Ø2x280mmKirschner Wire



X-ray Calibrator



Ø4.3 Drill Bit

Distal Lateral Femoral LISS Plate

Holes	L/R	Material	P.N
5Holes	Left	Ti	123421105
7Holes	Left	Ti	123421107
9Holes	Left	Ti	123421109
11Holes	Left	Ti	123421111
13Holes	Left	Ti	123421113
5Holes	Right	Ti	123421205
7Holes	Right	Ti	123421207
9Holes	Right	Ti	123421209
11Holes	Right	Ti	123421211
13Holes	Right	Ti	123421213

Proximal Lateral Tibial LISS Plate

Holes	L/R	Material	P.N
5Holes	Left	Ti	123420105
7Holes	Left	Ti	123420107
9Holes	Left	Ti	123420109
11Holes	Left	Ti	123420111
13Holes	Left	Ti	123420113
5Holes	Right	Ti	123420205
7Holes	Right	Ti	123420207
9Holes	Right	Ti	123420209
11Holes	Right	Ti	123420211
13Holes	Right	Ti	123420213

CanLISSImplants

Holes	L/R	Material	P.N
Φ5.0X18	18mm	TA	133203018
Φ5.0X20	20mm	TA	133203020
Φ5.0X22	22mm	TA	133203022
Φ5.0X24	24mm	TA	133203024
Φ5.0X26	26mm	TA	133203026
Φ5.0X28	28mm	TA	133203028
Φ5.0X30	30mm	TA	133203030
Φ5.0X32	32mm	TA	133203032
Φ5.0X34	34mm	TA	133203034
Φ5.0X36	36mm	TA	133203036
Φ5.0X38	38mm	TA	133203038
Φ5.0X40	40mm	TA	133203040
Φ5.0X42	42mm	TA	133203042
Φ5.0X44	44mm	TA	133203044
Φ5.0X45	45mm	TA	133203045
Φ5.0X46	46mm	TA	133203046
Φ5.0X48	48mm	TA	133203048
Φ5.0X50	50mm	TA	133203050
Φ5.0X55	55mm	TA	133203055
Φ5.0X60	60mm	TA	133203060
Φ5.0X65	65mm	TA	133203065
Φ5.0X70	70mm	TA	133203070
Φ5.0X75	75mm	TA	133203005
Φ5.0X80	80mm	TA	133203080
Φ5.0X85	85mm	TA	133203085
Φ5.0X90	90mm	TA	133203090
Φ5.0X95	95mm	TA	133203095
Φ5.0X100	100mm	TA	133203100

Locking Screw, self-drilling