





# Disclaimer

This surgical technique is exclusively intended for medical professionals, especially physicians, and therefore may not be regarded as a source of information for non-medical persons. The description of this surgical technique does not constitute medical advice or medical recommendations nor does it convey any diagnostic or therapeutic information on individual cases. Therefore, the attending physician is fully responsible for providing medical advice to the patient and obtaining the informed consent of the patient which this surgical technique does not supersede.

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The system LOQTEQ® Proximal Tibia Plates 3.5 comprises bone plates and screws for application at the proximal tibia as well as the necessary accessories for insertion. The flexibility of the system allows for safe reduction and stable fixation of various fracture patterns with respect to the indications mentioned in this technical guide. The design features of the implants in combination with standard surgical techniques and proven stability result in reliable constructs that support the bone during the healing process and allow for early mobilization of the patient.

#### Material

The LOQTEQ® implants and instruments are manufactured using high-quality materials, which have been proven to be successful in medical technology for decades. The anatomical plates and bone screws are made of titanium alloy. All materials employed comply with national and international standards. They are characterized by good biocompatibility, a high degree of safety against allergic reactions and good mechanical properties. LOQTEQ® implants show an excellent, highly polished surface.

# Indications / Contraindications Indications

The aap LOQTEQ® Proximal Lateral Tibia Plate 3.5 System is intended for:

- treatment of nonunions, malunions, and
- fractures of the proximal tibia, including simple, comminuted, lateral wedge, depression, medial wedge, bicondylar combination of lateral wedge and depression, and fractures with associated shaft fractures.

#### The aap LOQTEQ® Proximal Medial Tibia Plate 3.5 System is intended for:

- Metaphyseal fractures of the medial tibial plateau
- Split fractures of the medial tibial plateau
- Medial split fractures with depression
- Split or depression fracture of the medial tibial plateau

In addition, the plates may be used for fixation of the proximal quarter (lateral and medial) of the tibia as well as multi-fragment fractures of the proximal tibia

#### Contraindications

- Infection or inflammation (localized or systemic)
- Allergies against the implant material
- High risk patients for anesthesia
- Severe soft tissue swelling impacting normal wound healing
- Insufficient soft tissue coverage
- Fractures in children and adolescents with epiphyseal plates not yet ossified

#### Caution:

aap bone screws are neither designed nor approved for bolting or fixation of any elements (pediculi) of the cervical, thoracic or lumbar spine.

Detailed information on indications, contraindications and a complete list of adverse effects is included in the instructions for use.

## Processing (Sterilization & Cleaning)

**ααp** markets unsterilized products which are appropriately labeled and must be appropriately processed before use (see Instructions for Use, chapter "Processing of Medical Devices").

Never use damaged implants or implants from damaged packaging.





#### **Features & Benefits**

LOQTEQ® Proximal Lateral Tibia Plate 3.5



Various holes for K-wires and an oblong hole facilitate primary fixation of the plate.

An exceptional anatomical fit to the lateral condyle minimizes the need for intraoperative plate contouring.

4 proximal screws slightly diverge for optimum support of the tibial plateau.

Locking screws oriented in a diagonal cranial direction support the stabilization of medial fragments.

Metaphyseal plate holes accept locking (blue) and non-locking (gold) screws ø3.5 mm.

Gliding-locking holes in the plate shaft permit fracture compression and locking fixation in one step with ø3.5 mm locking screws (red).

Minor contact undercuts are designed to minimize the reduction in blood supply to the periosteum.

Aiming devices enhance secure insertion of drill guides in the pre-set angle.

The flattened end of the plate shaft is designed for sub-muscular insertion.

Available for left and right sides.

### LOQTEQ® Proximal Medial Tibia Plate 3.5



Various holes for K-wires and an oblong hole facilitate primary fixation of the plate.

An exceptional anatomical fit to the proximal medial tibia minimizes the need for intraoperative plate contouring.

3 proximal screws in the T-head slightly diverge for optimum support of the tibial plateau.

A cranially directed screw supports the stabilization of the tibial head.

The 3hole plate with a length of 58 mm only and 2.5 mm thickness is designed as a pure buttress plate, perfect for smaller fragments and double plating techniques.

Metaphyseal plate holes accept locking (blue) and non-locking (gold) screws ø3.5 mm.

Gliding-locking holes in the plate shaft permit fracture compression and locking fixation in one step with ø3.5 mm locking screws (red).

Minor contact undercuts are designed to minimize the reduction in blood supply to the periosteum.

Aiming devices enhance secure insertion of drill guides in the pre-set angle.

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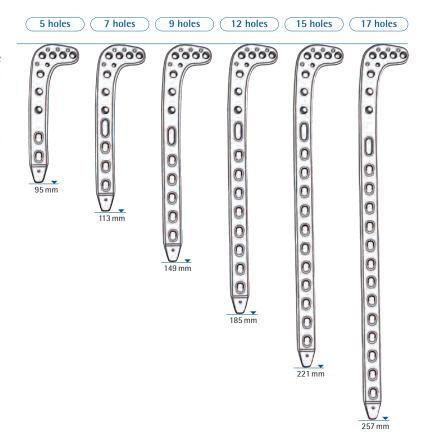
Available for left and right sides.



# **LOGTEG®**

# **Preoperative planning**

- Evaluate the fracture situation and select the appropriate plate size and position with an X-ray. Consider the use of independent lag screws, if necessary.
- Preoperatively assess the fracture situation using CT imaging where necessary.



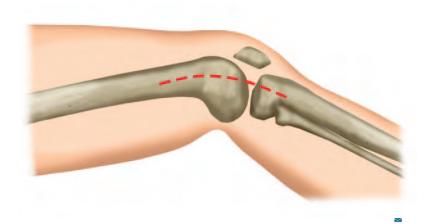
# Patient positioning

Place the patient in the supine position on a radiolucent operating table. Visualization of the proximal tibia under fluoroscopy in both AP and lateral views is necessary.



# **Approach**

• Lateral, according to the fracture situation.



## Preparing the plate



INSTRUMENTS	ARTNO.
Aiming device LOQTEQ® PLT Plate 3.5, R	IU 8187-01
Aiming device LOQTEQ® PLT Plate 3.5, L	IU 8187-02
Fixing screw aiming device LOQTEQ® SFI T15	IU 8176-03
Screwdriver Duo, T15, quick coupling	IU 7825-56
Large handle, cannulated, quick coupling	IU 7706-00

- Select the plate that fits the fracture pattern and patient's antomy.
- Position the aiming device on the plate and secure it with the fixing screw to facilitate correct alignment of the drill guides.

#### Note:

The fixing screw is connected to the aiming device in such a way that it is self-retaining. It can be removed for cleaning by applying gentle pressure to the tip of the screw from below.

#### Note:

Anatomically pre-contoured plates minimize the need for intraoperative bending. If necessary, the plates may be contoured.

#### CAUTION:

Contouring the metaphyseal part of a plate is not permitted when using a targeting device.

#### CAUTION:

Anatomically preformed plates should not be bent where possible. If plates are adapted to anatomical bone structures, the implants should not be bent back and forth repeatedly and excessively as this may result in implant failure. Damage caused by sharp edges should be avoided when bending. Locking plates should in principle be bent in the area between the holes only. Bending plates along locking holes may impair or even abolish their function completely. If angular stability is compromised by bending, a non-locking screw should be used.

INSTRUMENTS	ARTNO.
K-wire with trocar point, ø1.6, L 150	NK 0016-15

- Reduce and temporarily secure fracture fragments and the articular surface. Care must be taken when positioning K-wires or independent lag screws, that they do not interfere with the later plate position.
- External fixation may help with axial, angular and rotational control intraoperatively.
- Confirm anatomic reduction using fluoroscopy.
- Insert the plate from proximal to disal until the head portion is properly aligned under the tibal plateau. The plate is fixed to the bone with K-wires. Using a cortical screw in the oblong hole for primary fixation allows for corrections in plate positioning.
- Confirm plate position using fluoroscopy.

#### Reduction and primary fixation



# Proximal Lateral Tibia Plate 3.5

# **LOQTEQ®**

# Insertion of cortical screws (gold)



#### **INSTRUMENTS**

Double drill guide ø2.7/3.5, with spring aided centering Twist drill ø2.7, L 150, coil 50, quick coupling, single use Twist drill ø3.5, L 110, coil 50, quick coupling, single use Depth gauge for screws ø3.5 – 4.0, up to L 90 Screwdriver Duo, T15, quick coupling Large handle, cannulated, quick coupling

ART.-NO. IU 8116-60 IU 7427-15-1U IU 7435-00-1U IS 7904-20 IU 7825-56 IU 7706-00



#### Note:

If a combination of locking and non-locking screws is used, non-locking screws must be inserted first.

 To insert a cortical screw ø3.5 mm (gold) in the oblong hole, place the double drill guide in the center of the oblong hole and press it down.
 Drill to the desired depth with an appropriate drill. Determine the length of the screw using the depth gauge and insert a screw of appropriate length using the screwdriver.



Ensure proper alignment of the screwdriver and that the screwdriver tip is fully seated in the screw head.

- This screw can push the plate to the bone, if necessary.
- Check the plate position using fluoroscopy and adjust if required.
- Use this technique for inserting non-locking screws without compression into any other plate hole.
- When using a cortical screw as a lag screw, start with the drill for the
  gliding hole and the appropriate side of the double drill guide. Drill
  through the near cortex or perforating the fracture line, center the
  other side of the drill guide in the gliding hole and drill the core hole
  with an appropriate diameter drill through the far cortex.
  Determine the screw length using the depth gauge and insert a nonlocking cortical screw of the appropriate length.







## Insertion of locking screws (blue)



INSTRUMENTS	ARTNO.
Drill guide for round hole LOQTEQ® 3.5, I-ø 2.8, blue	IU 8166-20
Reduction sleeve for K-wire ø1.6	IU 8166-16
K-wire with trocar point, ø1.6, L 150	NK 0016-15
Twist drill ø2.7, L 220, coil 50, quick coupling, single use	IU 7427-22-1U
Depth gauge for screws ø3.5 - 4.0, up to L 90	IS 7904-20



#### Note:

If a combination of non-locking and locking screws is used, non-locking screws must be inserted first.

- Close to a joint, it is recommended to check the position of the later inserted screws with a K-wire. Insert a drill guide (blue) with reduction sleeve into a proximal plate hole for insertion of a K-wire ø1.6 mm and confirm later screw alignment using fluoroscopy. Adjust plate position if required. Remove K-wire and reduction sleeve for drilling.
- Drill to the desired depth using a drill ø2.7 mm (blue/red).

#### CAUTION:

The screwdriver duo is not intended for screwing the drill guide into the plate.

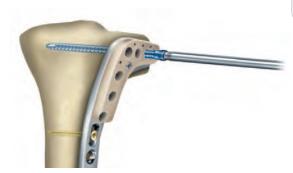
The screw length can be read off the calibration of the drill or determined using the depth gauge, after the drill guide has been removed. The stop ring facilitates reading off the calibration when attached to the drill. Push it down to the drill guide and remove the drill for reading the drilling depth in the gap of the ring.

#### Note:

The screwdriver duo facilitates manual removal of the drill guide.







INSTRUMENTS	ARTNO.
Screwdriver Duo, T15, quick coupling	IU 7825-56
Large handle, cannulated, quick coupling	IU 7706-00
Handle with quick coupling, with torque limiter, 2.0Nm	IU 7707-20

Select a locking screw (blue) of the proper length. Loosely insert the screw using the screwdriver T15 manually or under power with a low speed. Stop insertion when the screw head approaches the plate surface.

#### Note:

Ensure proper alignment of the screwdriver and that the screwdriver tip is fully seated in the screw head.

Finish the screw manually using the screwdriver bit T15 with the torque limiting handle 2.0 Nm. Optimal locking should be achieved with an audible and tactile click of the torque limiter.

#### ◆ CAUTION:

As soon as the head of the screw reaches the plate hole, it is compulsory to switch to the torque limiter.

- Alternatively, insert a non-locking cortical screw ø3.5 mm (see section "Insertion of cortical screws (gold)").
- Follow these instructions to insert further screws in the metaphyseal plate holes, depending on the fracture pattern. Finally, confirm that all screw heads are flush with the plate surface. Check the result using fluoroscopy and adjust screw positioning or length as necessary.





## Insertion of locking compression screws (red) without compression



INSTRUMENTS	ARTNO.
Drill guide for gliding hole LOQTEQ® 3.5, I-ø 2.8, red	IU 8166-10
Twist Drill ø2.7, L 150, coil 50, quick coupling, single use	IU 7427-15-1U
Depth gauge for screws ø3.5 - 4.0, up to L 90	IS 7904-20
Screwdriver Duo, T15, quick coupling	IU 7825-56
Handle with quick coupling, with torque limiter, 2.0Nm	IU 7707-20
Large handle, cannulated, quick coupling	IU 7706-00

# Note:

If a combination of non-locking and locking screws is used, nonlocking screws must be inserted first.

Insert a drill guide (red) into any chosen gliding hole and drill to the desired depth using a drill ø2.7 mm (blue/red).

#### CAUTION:

The screwdriver duo is not intended for screwing the drill guide into the plate.

- The screw length can be read off the calibration of the drill or determined using the depth gauge, after the drill guide has been removed.
- The stop ring facilitates reading off the calibration when attached to the drill. Push it down to the drill guide and remove the drill for reading the drilling depth in the gap of the ring.

#### Note:

The screwdriver duo facilitates manual removal of the drill guide.

Select a locking screw (red) of the proper length. Loosely insert the screw using the screwdriver T15 manually or under power with a low speed. Stop insertion when the screw head approaches the plate surface.

#### Note:

Ensure proper alignment of the screwdriver and that the screwdriver tip is fully seated in the screw head.

Finish the screw manually using the screwdriver bit T15 with the torque limiting handle 2.0 Nm. Optimal locking should be achieved with an audible and tactile click of the torque limiter.

#### CAUTION:

As soon as the head of the screw reaches the plate hole, it is compulsory to switch to the torque limiter. In cases of uncommonly hard bone, it may be necessary to finish the screw without the torque limiter to ensure the screw head is flush with the plate and the screw is locked.

Alternatively, insert a non-locking cortical screw ø3.5 mm (see section "Insertion of cortical screws (gold)").





## Proximal Lateral Tibia Plate 3.5

## Insertion of locking compression screws (red) with compression



INSTRUMENTS	ARTNO.
Basic Insert for load drill guide LOQTEQ® 3.5	IU 8166-05
Load Drill guide LOQTEQ® 3.5, compression 1mm	IU 8166-01
Load Drill guide LOQTEQ® 3.5, compression 2 mm	IU 8166-02
Twist Drill ø2.7, L 150, coil 50, quick coupling, single use	IU 7427-15-1U
Depth gauge for screws ø3.5 - 4.0, up to L 90	IS 7904-20
Screwdriver duo, T15, quick coupling	IU 7825-56
Large handle, cannulated, quick coupling	IU 7706-00
Handle with quick coupling, with torque limiter, 2.0Nm	IU 7707-20
OPTIONAL	
Load drill guide LOQTEQ® 3.5, adjustable up to 2mm	IU 8166-03



- LOQTEQ® gliding holes allow for fracture compression with subsequent locking fixation in one step. Load drill guides enable compressing fracture gaps of up to 2 mm.
- Screw the basic insert for load drill guides into a shaft hole near the fracture line or, if necessary, above the fracture line. Choose a load drill guide in accordance with the compression distance (1 mm or 2 mm), slide it on the basic insert and place the drill guide in the next plate hole, away from the fracture gap. Avoid pressure on the drill guide.



The screwdriver duo is not intended for screwing the basic insert into the plate.

If available, use the adjustable load drill guide. The fracture gap serves as orientation in setting the compression distance (max. 2 mm) by turning the wheel of the load drill guide until an appropriate gap opens in the upper part of the instrument.

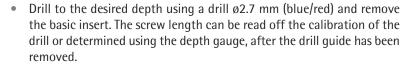


Care should be taken when selecting the proper compression distance (1 mm or 2 mm). Avoid overcompression to ensure full locking of the screw, especially in hard bone.









#### Note:

The screwdriver duo facilitates manual removal of the basic insert.

Select a locking screw (red) of the proper length. Loosely insert the screw using the screwdriver T15 manually or under power with a low speed. Stop insertion when the screw head approaches the plate surface. Finish the screw manually using the screwdriver bit T15 with the torque limiting handle 2.0 Nm. Optimal locking should be achieved with an audible and tactile click of the torque limiter.

#### CAUTION:

As soon as the head of the screw reaches the plate hole, it is compulsory to switch to the torque limiter. In cases of uncommonly hard bone, it may be necessary to finish the screw without the torque limiter to ensure the screw head is flush with the plate and the screw is locked.

- Alternatively, insert a non-locking cortical screw (gold) as a compression screw by placing the double drill guide without pressure in an offcenter position in the plate hole. For insertion of the screw, follow the instructions on page 6.
- Follow these instructions to insert further screws in the plate holes depending on the fracture pattern. Finally, confirm that all screw heads are flush with the plate surface. Check the result using fluoroscopy and adjust screw positioning or length as necessary.





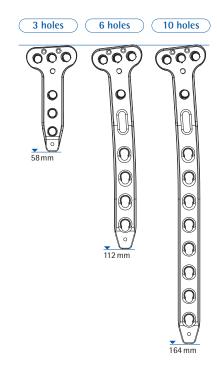




# **LOQTEQ®**

# **Preoperative planning**

- Evaluate the fracture situation and select the appropriate plate size and position with an X-ray. Consider the use of independent lag screws, if necessary.
- Preoperatively assess the fracture situation using CT imaging where necessary.



# **Patient positioning**

Place the patient in the supine position on a radiolucent operating table. Visualization of the proximal tibia under fluoroscopy in both AP and lateral views is necessary.



# **Approach**

Medial, according to fracture situation





## Preparing the plate



ARTNO.
IU 8186-01
IU 8186-02
IU 8176-03
IU 7825-56
IU 7706-00

- Select the plate that fits the fracture pattern and patient's anatomy.
- Position the aiming device on the plate and secure it with the fixing screw to facilitate correct alignment of the drill guides.

#### Note:

The fixing screw is connected to the aiming device in such a way that it is self-retaining. It can be removed for cleaning by applying gentle pressure to the tip of the screw from below.

#### Note:

Anatomically pre-contoured plates minimize the need for intraoperative bending. If necessary, the plates may be contoured.

#### CAUTION:

Contouring the metaphyseal part of a plate is not permitted when using a targeting device.

#### CAUTION:

Anatomically preformed plates should not be bent where possible. If plates are adapted to anatomical bone structures, the implants should not be bent back and forth repeatedly and excessively as this may result in implant failure. Damage caused by sharp edges should be avoided when bending. Locking plates should in principle be bent in the area between the holes only. Bending plates along locking holes may impair or even abolish their function completely. If angular stability is compromised by bending, a non-locking screw should be used.



## Reduction and primary fixation



#### INSTRUMENTS K-wire with trocar point, ø1.6, L 150

**ART.-NO.** NK 0016-15

- Reduce and temporarily secure fracture fragments and the articular surface. Care must be taken when positioning K-wires or independent lag screws, that they do not interfere with the later plate position.
- External fixation may help with axial, angular and rotational control intraoperatively.
- Confirm anatomic reduction using fluoroscopy.
- Insert and position the plate under the tibial plateau. Medial to anteromedial positioning is chosen depending on the fracture type. The plate is fixed to the bone with K-wires.
- Using a cortical screw in the oblong hole for primary fixation allows for corrections in plate positioning.
- Confirm plate position using fluoroscopy.
- Secure the plate to the bone by inserting screws from proximal to distal.
   Follow the instructions for screw insertion in the relevant sections for non-locking screws (gold) and locking screws (blue and red).

#### • Note:

The short 3hole plate is designed as a pure buttress plate and features round locking holes only.

• Finally, confirm that all screw heads are flush with the plate surface. Check the result using fluoroscopy and adjust screw positioning or length as necessary.





**INSTRUMENTS** ART.-NO. IU 7811-15 Explanation screwdriver, T15, round handle

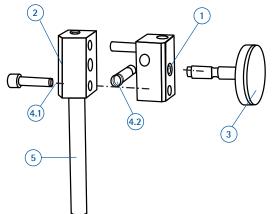
#### Note:

The screwdriver T15 (IU 7825-56) in the set are self-retaining and should not be used for screw removal.

- Use the appropriate explantation screwdriver for safe removal of a screw. Explantation screwdrivers are not self-retaining, penetrate further into the screw head and thus permit a higher torque when removing screws. They are not included in the set as standard and must be ordered separately.
- Place an incision on the old scar. Manually undo all screws and sequentially remove them. After manually unlocking all screws, removal may be performed using a power tool.



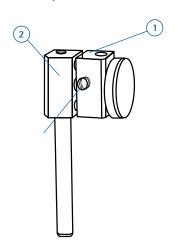
# **Disassembly**



## Adjustable load drill guide (IU 8166-03)

- Remove screws (item 4.1 and 4.2) using a hexagonal screwdriver 2.5
- Unscrew the set screw (item 3)
- Pull the compression block apart (items 1 and 2)

# **Assembly**



- Fit together the compression block (items 1 and 2)
- Insert the set screw (item 3) into the compression block, middle hole
- Insert the retaining screws (items 4.1 and 4.2) using a hexagonal screwdriver 2.5









#### LOQTEQ® Proximal Medial Tibia Plate 3.5 HOLES LENGTH LEFT RIGHT (mm) 3 58 PA 3552-03-2 PA 3551-03-2 6 PA 3552-06-2 PA 3551-06-2 112 10 164 PA 3552-10-2 PA 3551-10-2

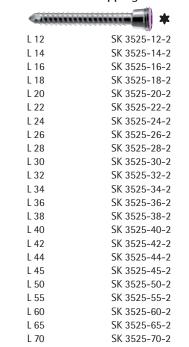


ı	OQTEQ® Proximal	Lateral Tibia Plate 3	.5	
HOLES	LENGTH (mm)	LEFT	RIGHT	
5	95	PA 3542-05-2	PA 3541-05-2	
7	113	PA 3542-07-2	PA 3541-07-2	
9	149	PA 3542-09-2	PA 3541-09-2	
12	185	PA 3542-12-2	PA 3541-12-2	
15	221	PA 3542-15-2	PA 3541-15-2	
17	257	PA 3542-17-2	PA 3541-17-2	



**Screws** 

#### LOQTEQ® Cortical Screw 3.5, T15, self-tapping



## LOQTEQ® Cortical Screw 3.5, small head, T15, self-tapping

	*
L 12	SK 3526-12-2
L 14	SK 3526-14-2
L 16	SK 3526-16-2
L 18	SK 3526-18-2
L 20	SK 3526-20-2
L 22	SK 3526-22-2
L 24	SK 3526-24-2
L 26	SK 3526-26-2
L 28	SK 3526-28-2
L 30	SK 3526-30-2
L 32	SK 3526-32-2
L 34	SK 3526-34-2
L 36	SK 3526-36-2
L 38	SK 3526-38-2
L 40	SK 3526-40-2
L 42	SK 3526-42-2
L 45	SK 3526-45-2
L 50	SK 3526-50-2
L 55	SK 3526-55-2
L 60	SK 3526-60-2
L 65	SK 3526-65-2
L 70	SK 3526-70-2
L 75	SK 3526-75-2
L 80	SK 3526-80-2
L 85	SK 3526-85-2
L 90	SK 3526-90-2

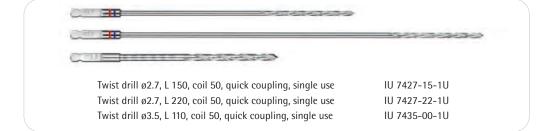
#### Cortical Screw 3.5, T15, self-tapping

L 10	SK 3514-10-2
L 12	SK 3514-12-2
L 14	SK 3514-14-2
L 16	SK 3514-16-2
L 18	SK 3514-18-2
L 20	SK 3514-20-2
L 22	SK 3514-22-2
L 24	SK 3514-24-2
L 26	SK 3514-26-2
L 28	SK 3514-28-2
L 30	SK 3514-30-2
L 32	SK 3514-32-2
L 34	SK 3514-34-2
L 36	SK 3514-36-2
L 38	SK 3514-38-2
L 40	SK 3514-40-2
L 42	SK 3514-42-2
L 45	SK 3514-45-2
L 50	SK 3514-50-2
L 55	SK 3514-55-2
L 60	SK 3514-60-2
L 65	SK 3514-65-2
L 70	SK 3514-70-2
L 75	SK 3514-75-2
L 80	SK 3514-80-2
L 85	SK 3514-85-2













Screwdriver Duo, T15, quick coupling

IU 7825-56 🛊













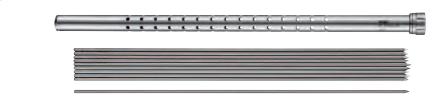


Aiming device LOQTEQ® PMT Plate 3.5, R Aiming device LOQTEQ® PMT Plate 3.5, L Fixing screw aiming device LOQTEQ® SFI T15 Ť

IU 8186-01 IU 8186-02 IU 8176-03



Aiming device LOQTEQ® PLT Plate 3.5, R Aiming device LOQTEQ® PLT Plate 3.5, L Fixing screw aiming device LOQTEQ® SFI T15 IU 8187-01 IU 8187-02 IU 8176-03



Caddy for K-wire L 150 K-wire with trocar point, ø1.6, L 150 IC 0006-15 NK 0016-15

# Clinical Case Fracture of the Proximal Tibia (AO 41-C1)

# Preoperative





# **Postoperative**







Subject to technical modifications, errors and misprints.

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