SURGICAL TECHNIQUE

ALP titanium proximal Tibia plate OPTIMUS

TRAUFIX
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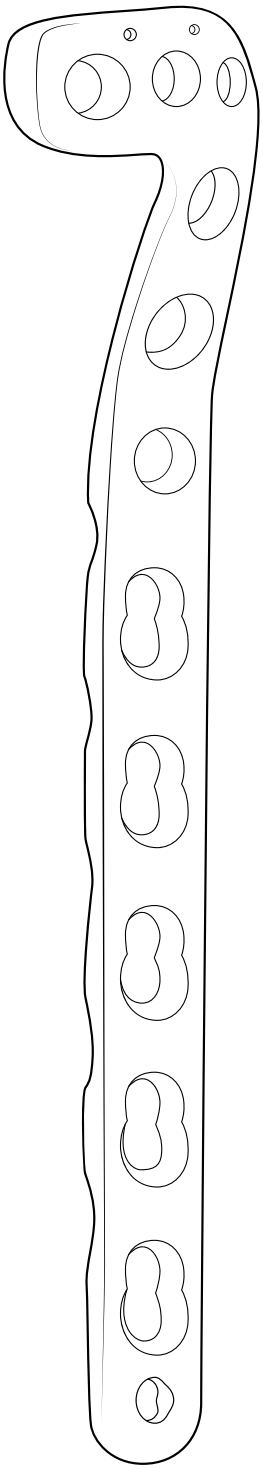
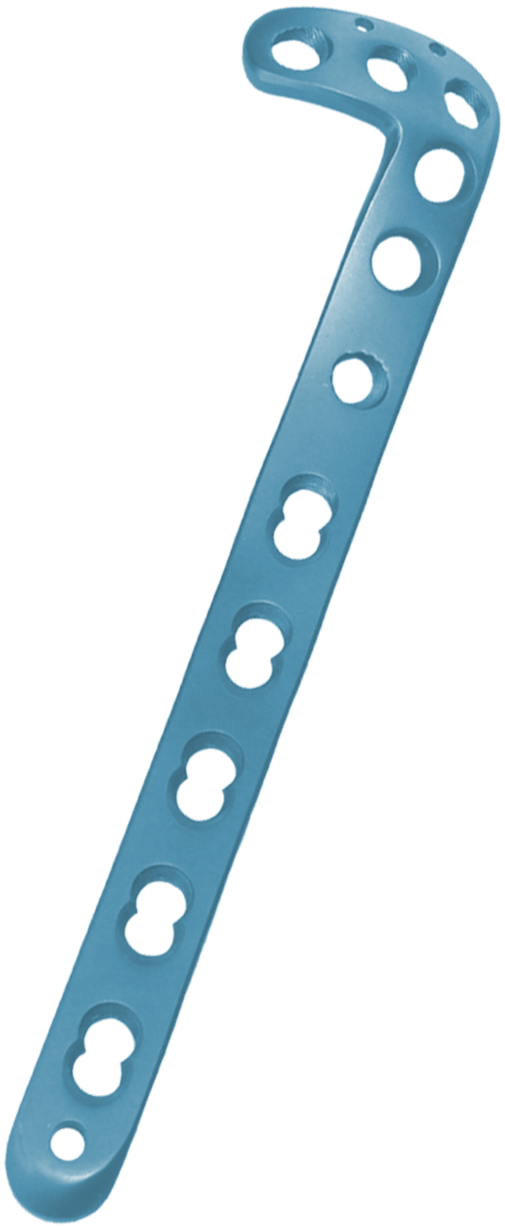


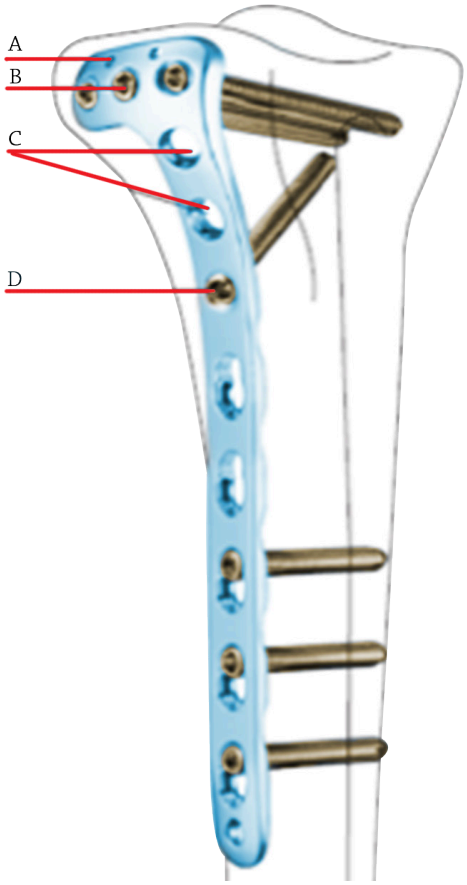
TECHNOLOGICAL ADVANTAGES

Traufix proximal tibia ALP plate combines some osteosynthesis techniques with locking screw techniques. Hexagonal locking screws can be used on the head and neck of the plate. The holes for the screws are distributed in such a way that a line of locking subcondral screws can be placed to reinforce and maintain the reduction of the joint surface. The plate has holes that function as dynamic compression holes or as locking threaded holes; adding resistance to local sinking loads, as well as adding mounting stability at a fixed created angle by locking the screws on the plate. These combined holes provide axial compression flexibility and locking capability along the plate.



DESCRIPTION OF THE PLATE

- Two Kirschner wire holes to fix fractured and extraarticular fragments and place plate accurately (A).
- The three locking holes closest to the head support 5.5mm hexagonal locking screws to fix the position of the plate (B).
- Two circular holes below the plate head, for 4.5mm cortical screws and 6.5mm cancellous screws: possibility to fix and compress additional fragments if necessary (C).
- Locking hole for diagonal insertion of a 5.0mm locking screw sideways and upwards
- Combined holes in the lower part of the shaft , which combine a dynamic compression hole and a locking threaded hole. The combined holes support 5.0mm and 5.5mm hexagonal T-locking screws on their threaded part, and 4.5mm cortical screws.
- Anatomical molding to fit the side face of the proximal tibia.
- Ti6Al4V ELI titanium alloy left and right plates are available with 4, 6, 8, 10, 12 or 14 holes.



SURGICAL INDICATIONS

Plates are indicated for the treatment of pseudoarthrosis, defective consolidations and fractures of the proximal portion of the tibia; For example:

- Simple fractures
- Comminuted fractures
- Side wedge fractures
- Sinking fractures
- Medial wedge fractures
- Bicondydic fractures, combining a lateral wedge fracture and a sinking fracture
- Proximal fractures associated with a diaphyseal fracture

Note: In all cases, an adapted reduced post-operation mobilization is mandatory.

GENERAL CONTRAINDICATIONS

- Systemic inflammatory response syndrome (to be evaluated by the surgeon).
- Septicemia.
- Osteomyelitis.
- Patient unable to comply with post-operation care.
- Hypersensitivity to the materials (titanium).

DESCRIPTION OF THE SURGICAL TECHNIQUE

Preparation

Complete the pre-operation X-ray assessment and develop the pre-operation plan. Determine the length of the plate and instruments to use. Determine the situation and length of the proximal screws to ensure proper placement of the screws in the tibial metaphysis.

The patient should be placed in supine decubitus on an operating room radio-transparent table. A correct radioscopic visualization of the proximal tibia is essential, both in lateral projection and antero-posterior

Reducing the joint surface

Tip: Before the reduction, applying an external fixer or large distractor can facilitate the display and reduction of the joint.

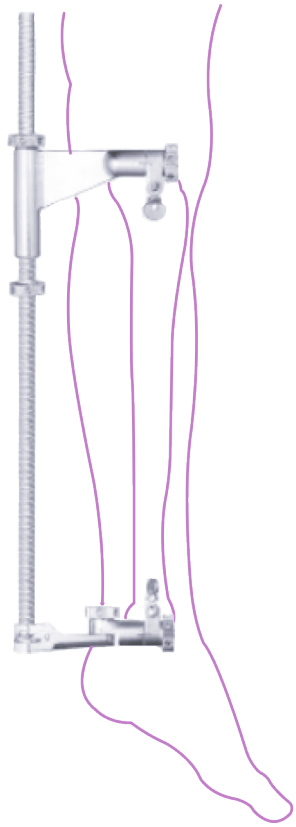
Reduce fracture fragments and check reduction with the fluoroscope. Fragments can be reduced with independent Kirschner wire, but the plate also has special holes for Kirschner wire, in order to provide temporary reduction, plate placement or fixation. Locking screws do not provide interfragmentary compression or compression between the plate and bone; therefore, any desired compression will have to be achieved with traditional traction screws. Before applying the ALP plate with locking screws, it is necessary to have reduced the joint fragments and applied the desired compression.

Tip: To check that the traction screws will not interfer with the placement of the plate, hold the plate laterally in reference to the bone.

Determining the situation of the proximal screws

Before placing the plate on the bone, it is suggested to screw two threaded drill guides (128.32 or 128.40) into the nonadjacent threaded holes of the plate head. Insert a 4.0mm percutaneous bit into each guide and confirm that both bits are parallel in the cross plane. This checks whether the drill guides are properly screwed into the plate, which subsequently ensures proper insertion of the screws.

Caution
This technique is suggested to describe the use of the TRAUFIX instruments and implants, not aiming to interfere with the experience and decisions of the traumatologist considering his/her vast clinical and surgical experience to determine the best proposal for each particular patient.



Determining the position of the plate

Using anatomical signals and radioscopic imaging, apply plate to the intact or reconstructed tibial plate, without attempting to reduce the distal part of the fracture. Insert a 2.0mm Kirschner wire through one of the top small holes. (See image 1). If necessary, adjust the position of the plate again. Insert a second Kirschner wire through another of the small holes to prevent plate rotation and temporarily secure the plate to the tibial plate. Kirschner wire should penetrate several millimeters beyond the medial cortical.

Image 1

Before moving forward, check the status of the plate head by clinical and radioscopic examination; check that:

- The screws of the proximal locking holes follow parallel trajectory to the joint in the transverse plane, and the plate is properly oriented in the tibial plate.
- The placement of the plate and screws is consistent with pre-operation planning.
- The plate is correctly aligned in reference to the tibial diaphysis, both in lateral projection and anteroposterior.

Drilling for proximal screws

With the plate still placed on the tibia, use the 4.0mm percutaneous bit to drill the hole for the locking screw through one of the two threaded guides screwed on the plate. It is essential to drill under radioscopic control to ensure that the placement and trajectory of the screw are adequate. Drill to the medial cortical or to the desired insertion depth for the screw tip. (See image 2)

Determine the appropriate screw length, which is indicated on the calibrated bit. Remove the bit and drill guide. Another possibility is to use the depth meter to determine the proper length of the screw.

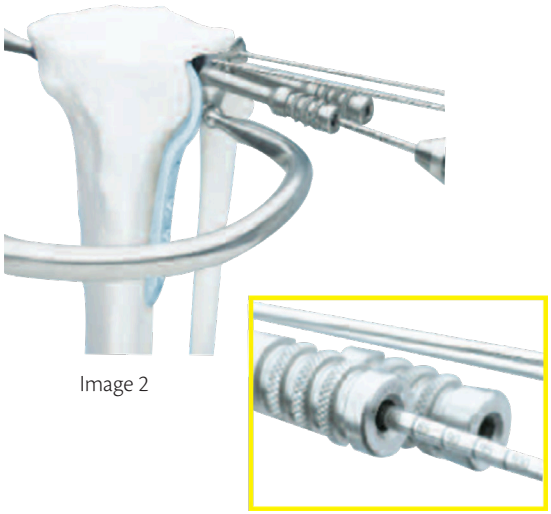


Image 2

Inserting the proximal screws

Note: The proximal tibia plate can serve as a support for a medial wedge. This is achieved by convergence of the metaphyseal locking screws with the oblique locking screws inserted from below.

Screws inserted into the plate head are usually 80mm in length.
If it is necessary to reduce a fragment with a traction screw, it is necessary to do so before inserting the locking screws into it. Occasionally a previous perforation of the lateral cortical with the 4.0mm percutaneous bit may be required.

At this point, check the screw placement with the fluoroscope arc. (See image 3)

Image 3

Use a hex screwdriver to manually insert the locking screw of the appropriate length. Tighten the locking screw carefully, as there is no need to apply excessive force to obtain an effective locking of the screw on the plate.

Repeat for the remaining proximal locking holes. Tighten all screws tightly to lock them on the plate.

Reducing the diaphysis from the tibial plate

Reduce tibial diaphysis in reference to the to the plate, using indirect reduction techniques whenever possible. Using an atraumatic technique, attach the plate to the tibial diaphysis with the help of bone tweezers.

Confirm the rotary alignment of the limb by clinical exploration. Once a satisfactory and adequate reduction has been obtained for the morphological characteristics of the fracture, load tension on the plate with the help of the articulated tensioner. (See image 4)

Image 4

Note: In multifragmentary fractures, it is not always possible or desirable to achieve anatomical fracture reduction. In simple fractures, however, the articulated plate tensioner can facilitate anatomical reduction. This instrument can be used to generate both compression and distraction. (See image 5)

In addition to the locking threaded holes, the plate also has dynamic compression holes, so it also works similarly to a DCP plate, with the ability to self-compress the fragments of the fracture. Therefore, it offers the possibility to combine traction screws and locking screws.

Important: If cortical screws (1) and locking screws (2) are combined, a cortical screw must first be inserted to bring the plate closer to the bone.

If locking screws (1) have been used to secure the plate to a fragment, it is not recommended to then insert a cortical screw (2) into the same fragment without having previously loosened the locking screw, which will need to be tightened again afterwards.

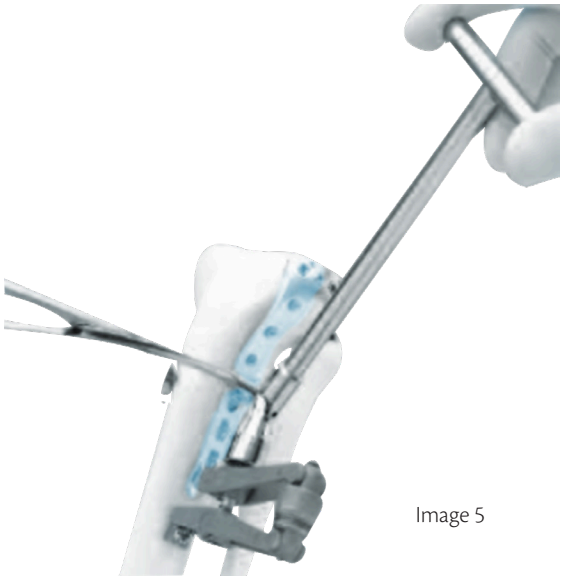
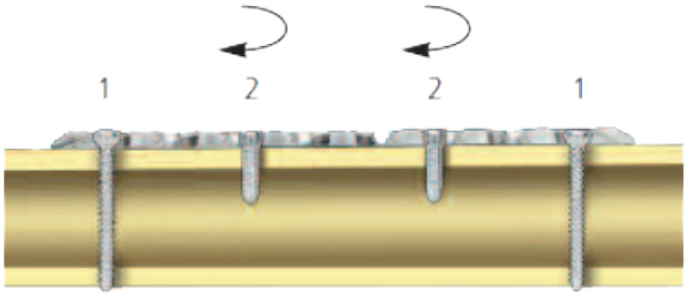
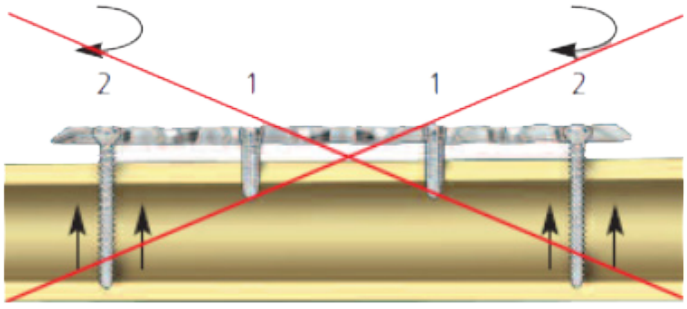


Image 5



Correct



Incorrect

Inserting cortical screws into the plate shaft

Insert as many standard 4.5mm cortical screws into the distal part of the plate as needed. (See image 6) Important: All 4.5mm cortical screws must be inserted before inserting 5.0 or 5.5 locking screws. Pre-drill both corticals with the 3.2mm or 3.5mm or 4.0mm bit through the universal drill guide as required. To drill in a neutral position, press down the drill guide into the non-threaded hole. For compression, place the drill guide at the end of the non-threaded hole further away from the fracture line. Do not apply downward pressure to the con spring tip of the drill guide.

Image 6

FLAT POSITION COMPRESSION

Determine the length of the screw using a depth meter. Select and insert the 4.5mm cortical screw of the appropriate length.

Inserting locking screws into the plate shaft

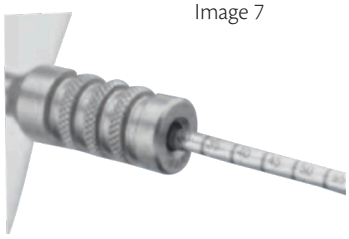
Screw the threaded bit guide (128.32 or 128.40) into one of the locking holes of the plate shaft , and proceed to drill the screw hole with the 4.0mm percutaneous bit. (See image 7)

Note: It is essential to use the drill guide so that the screws lock properly on the plate.

Determine the appropriate screw length, which is indicated on the calibrated bit.

Remove the bit and drill guide..

Image 7



Use the hex screwdriver to manually insert the locking screw of the appropriate length. Tighten the locking screw carefully, as there is no need to apply excessive force to obtain an effective locking of the screw on the plate. (See image 8)

Image 8

Inserting the locking screw into the oblique hole

Tip: Mount a threaded drill guide to the most distal of the oblique locking holes, and proceed to drill the channel for the screw with the 4.0mm percutaneous bit.
Determine the appropriate screw length, which is indicated on the calibrated bit. Remove the bit and drill guide.
Alternative: Use the hex screwdriver to manually insert the locking screw of the appropriate length. Tighten the locking screw carefully, as there is no need to apply excessive force to obtain an effective locking of the screw on the plate.

- Screw length considerations
  Oblique locking hole: The oblique locking screw on the plate shaft converges with the central locking screw on the plate head to increase tensile detachment resistance and reinforce the fixation. If the oblique locking screw is more than 65mm long, it will come into contact with the proximal locking screw.

Cleaning of instruments

Cleaning the threaded drill guides cannulation is indispensable for proper operation.
Instruments should be cleaned intraoperatively with the 2.5mm cleaning needle to prevent the accumulation of residues in the cannulation.

Implant removal

The decision to remove the implant is up to the treating physician. It is recommended to remove the implant once the consolidation process is complete, provided that it is feasible and suitable for the patient. To remove the screws, first clear the screw head by eliminating the tissue that may have been able to penetrate the hexagonal inlet to ensure that the screwdriver enters properly and reduce the risk of damage to it that prevent it from being removed. Unscrew all screws and remove them and then remove the plate.

IMPLANTS AND INSTRUMENTS

PLATES

ALP TITANIUM PROXIMAL TIBIA PLATE OPTIMUS RIGHT

152.04 ALP titanium proximal tibia plate OPTIMUS 4 holes right
152.06 ALP titanium proximal tibia plate OPTIMUS 6 holes right
152.08 ALP titanium proximal tibia plate OPTIMUS 8 holes right
152.10 ALP titanium proximal tibia plate OPTIMUS 10 holes right
152.12 ALP titanium proximal tibia plate OPTIMUS 12 holes right
152.14 ALP titanium proximal tibia plate OPTIMUS 14 holes right

ALP TITANIUM PROXIMAL TIBIA PLATE OPTIMUS LEFT

153.04 ALP titanium proximal tibia plate OPTIMUS 4 holes left
153.06 ALP titanium proximal tibia plate OPTIMUS 6 holes left
153.08 ALP titanium proximal tibia plate OPTIMUS 8 holes left
153.10 ALP titanium proximal tibia plate OPTIMUS 10 holes left
153.12 ALP titanium proximal tibia plate OPTIMUS 12 holes left
153.14 ALP titanium proximal tibia plate OPTIMUS 14 holes left

SCREWS

5.0mm TITANIUM CORTEX LOCKING SCREW

108.20 5.0mm titanium cortex locking screw 20mm
108.22 5.0mm titanium cortex locking screw 22mm
108.24 5.0mm titanium cortex locking screw 24mm
108.26 5.0mm titanium cortex locking screw 26mm
108.28 5.0mm titanium cortex locking screw 28mm
108.30 5.0mm titanium cortex locking screw 30mm
108.32 5.0mm titanium cortex locking screw 32mm
108.34 5.0mm titanium cortex locking screw 34mm
108.36 5.0mm titanium cortex locking screw 36mm
108.38 5.0mm titanium cortex locking screw 38mm
108.40 5.0mm titanium cortex locking screw 40mm
108.42 5.0mm titanium cortex locking screw 42mm
108.44 5.0mm titanium cortex locking screw 44mm
108.46 5.0mm titanium cortex locking screw 46mm
108.48 5.0mm titanium cortex locking screw 48mm
108.50 5.0mm titanium cortex locking screw 50mm
108.55 5.0mm titanium cortex locking screw 55mm
108.60 5.0mm titanium cortex locking screw 60mm
108.65 5.0mm titanium cortex locking screw 65mm
108.70 5.0mm titanium cortex locking screw 70mm

4.5mm TITANIUM CORTEX SCREW

126.12 4.5mm titanium cortex screw 12mm
126.14 4.5mm titanium cortex screw 14mm
126.16 4.5mm titanium cortex screw 16mm
126.18 4.5mm titanium cortex screw 18mm
126.20 4.5mm titanium cortex screw 20mm
126.22 4.5mm titanium cortex screw 22mm
126.24 4.5mm titanium cortex screw 24mm
126.26 4.5mm titanium cortex screw 26mm
126.28 4.5mm titanium cortex screw 28mm
126.30 4.5mm titanium cortex screw 30mm
126.32 4.5mm titanium cortex screw 32mm
126.34 4.5mm titanium cortex screw 34mm
126.36 4.5mm titanium cortex screw 36mm
126.38 4.5mm titanium cortex screw 38mm
126.40 4.5mm titanium cortex screw 40mm
126.45 4.5mm titanium cortex screw 45mm
126.50 4.5mm titanium cortex screw 50mm
126.55 4.5mm titanium cortex screw 55mm
126.60 4.5mm titanium cortex screw 60mm
126.65 4.5mm titanium cortex screw 65mm
126.70 4.5mm titanium cortex screw 70mm

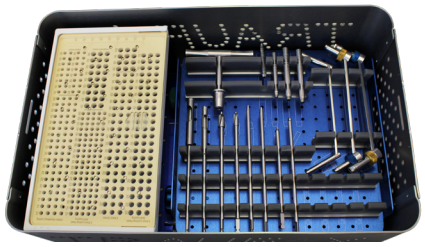
5.5mm TITANIUM CANCELLOUS LOCKING SCREW

109.40 5.5mm titanium cancellous locking screw 40mm
109.45 5.5mm titanium cancellous locking screw 45mm
109.50 5.5mm titanium cancellous locking screw 50mm
109.55 5.5mm titanium cancellous locking screw 55mm
109.60 5.5mm titanium cancellous locking screw 60mm
109.65 5.5mm titanium cancellous locking screw 65mm
109.70 5.5mm titanium cancellous locking screw 70mm
109.75 5.5mm titanium cancellous locking screw 75mm
109.80 5.5mm titanium cancellous locking screw 80mm
109.85 5.5mm titanium cancellous locking screw 85mm
109.90 5.5mm titanium cancellous locking screw 90mm

INSTRUMENTS

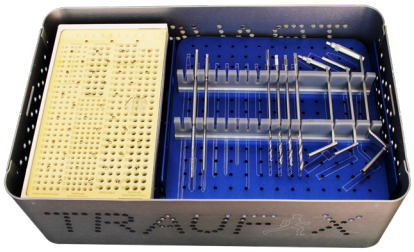
The following instruments are designed to anchor only on Traufix implants, the use of instruments from other brands may damage the product and not anchor properly.

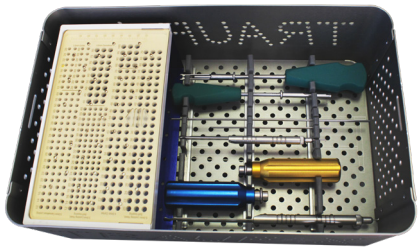
CODE	DESCRIPTION
128.32	Drill guide for 3.2mm drill bit
128.40	Drill guide for 4.0mm drill bit



Other generic instruments needed:

QTY.	DESCRIPTION
2	2.0mm threaded guide-wire
2	1.5mm threaded guide-wire
1	3.5mm hexagonal screwdriver for 4.5mm/6.5mm screw
1	3.2mm eccentric neutral drill guide
1	4.5mm/6.5mm double drill guide
1	3.2mm/4.5mm double drill guide
1	Torque wrench AO of 4.0Nm
1	T-handle with quick coupling (AO)
1	90mm depth gauge
1	8mm countersink tip for 4.5mm/6.5mm screw
1	3.5mm screwdriver hexagonal tip
1	3.5mm hexagonal screw extractor tip
1	4.5mm tap tip
1	8.5mm reamer tip for large fragments
1	3.2mm drill bit quick coupling
1	3.5mm drill bit quick coupling
1	4.0mm drill bit quick coupling





NOTES

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