

LCP Pediatric Hip Plate. For osteotomy and trauma applications in the proximal femur.

Technique Guide



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 Image intensifier control

Warning

This description is not sufficient for immediate application of the instrumentation. Instruction by a surgeon experienced in handling this instrumentation is highly recommended.

Features and Benefits

Design

The LCP Pediatric Hip Plate system is a highly innovative system for stable fixation of varus, valgus and derotation osteotomies and fractures in pediatric orthopedics.

For the first time the highly successful technique of the locking compression plate, which has enjoyed great success in adult surgery over recent years, is incorporated in a system dedicated to pediatrics – the LCP Pediatric Hip Plate system.

Anatomic design

Anatomically tailored plate design, which simplifies the positioning of the plate onto the bone and reduces the risk of soft tissue irritations.

Angular stability

Reduces the risk of a primary and secondary loss of correction. Limited contact of the plate onto the periosteum minimizes periosteal blood circulation problems. Due to the angular stability it is now in the majority of cases no longer necessary to form a cast when performing surgery with the LCP Pediatric Hip Plate.

Simple and safe surgical technique

In comparison to the conventional implant systems, the LCP Pediatric Hip Plate system allows intraoperative corrections. The variety of different screw lengths allow an optimal fit to each individual situation and therefore grant a high level of flexibility

Product range

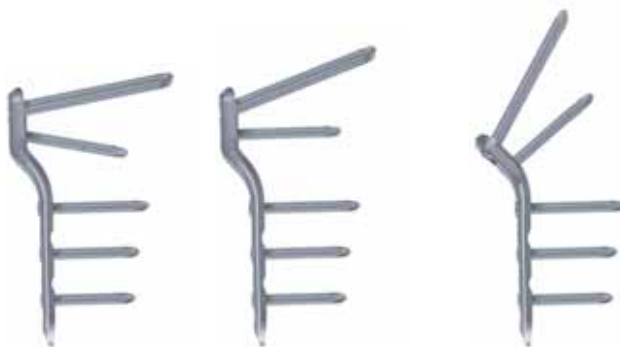
The product range consists of eight plates: four small fragment plates 3.5 and four large fragment plates 5.0.

Plates for varisation osteotomy

The plates are available with screw angles of 100° and 110°.

Plate for valgisation osteotomy

The plate is available with a screw angle of 150°.



Characteristics

The plate has a universal design for the left and right proximal femur.

The main characteristics of the implant system are three locking screws in the proximal part of the plate. Two femoral neck screws and an additional, diverging calcar screw ensure an excellent fixation in the bone. Three screws are for the fixation of the plate in the femoral shaft. The surgeon can select either locking screws or conventional cortex screws in the shaft as preferred.

The implant is available in stainless steel.

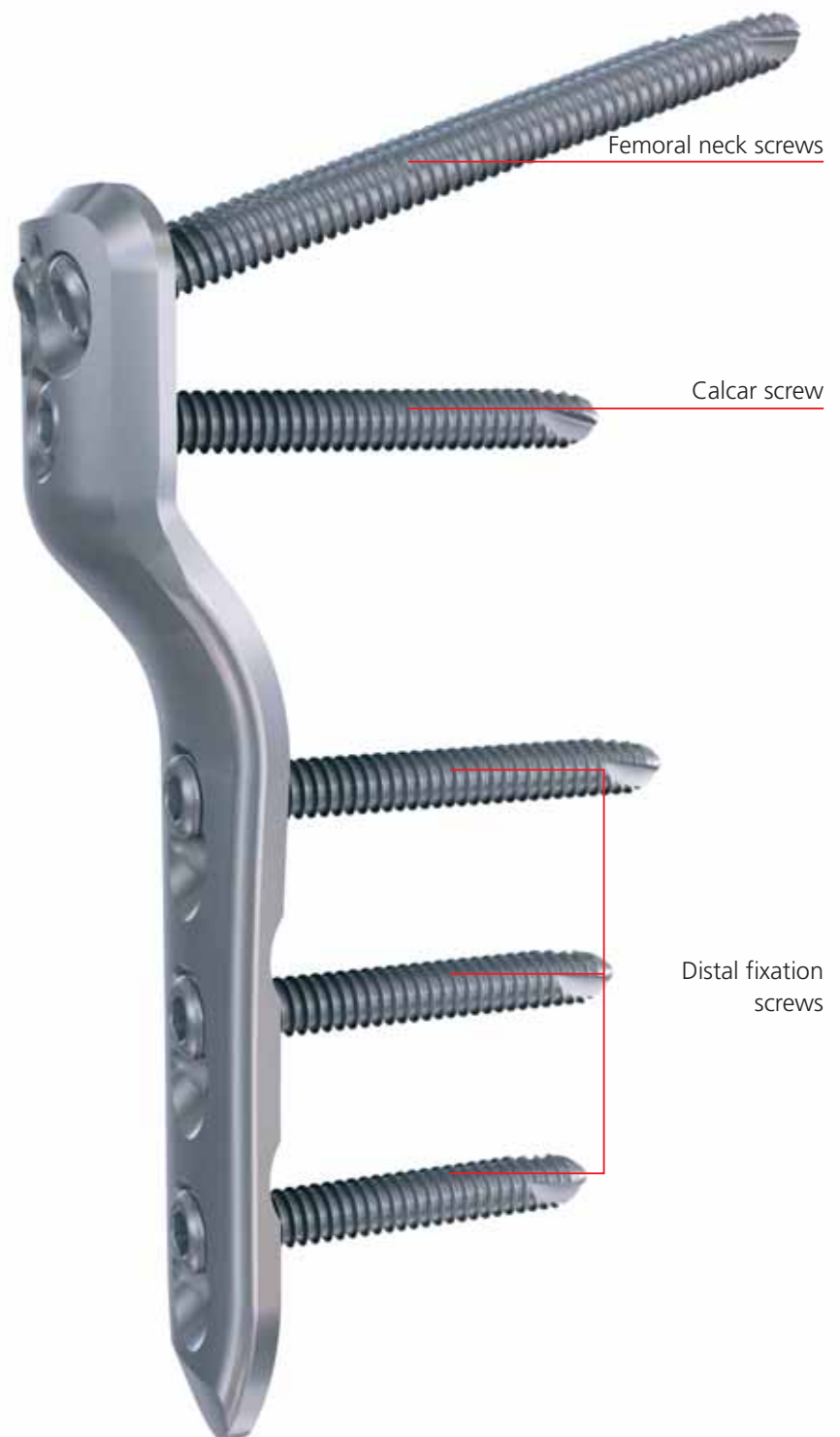


Plate for trauma and derotation osteotomy

The plate is available with a screw angle of 120° and 4 distal fixation screws.



In 1958, the AO ASIF (Association for the Study of Internal Fixation) formulated four basic principles, which have become the guidelines for internal fixation:¹

Anatomic reduction

The LCP Pediatric Hip Plate System combines an adequate reduction and optimal protection of soft tissue. Especially in children the anatomic reduction must be seen relatively. The system is optimally adapted to the anatomy of children and adolescents and enables a perfect internal fixation of any kind of correction osteotomies of the proximal femur as well as stabilization of femoral neck and pertrochanteric fractures.

Stable fixation

The fixation of the LCP plate with angular stable screws reduces the risk of loss of correction in osteotomies intra- and post-operatively even if fragments are only partially adapted.

Preservation of blood supply

Limited contact between plate and bone reduces disruption of the periosteal blood supply.

Early mobilization

The use of LCP implants allows an early and active mobilization including a cast-free postoperative management in younger and handicapped children.

¹ M.E. Müller, M. Allgöwer, R. Schneider, and H. Willenegger (1991) AO Manual of Internal Fixation, 3rd Edition. Berlin: Springer.

Indications and Contraindication

Indications

The LCP Pediatric Hip Plate is intended for use in pediatrics (children from 2 to 16 years) and for small-stature adult patients. Specific indications include:

- Inter- and sub-trochanteric varus osteotomies
- Inter- and sub-trochanteric valgus osteotomies
- Inter- and sub-trochanteric derotation osteotomies
- Fractures of the proximal femur

Contraindications

Applications in children or adults which are inappropriate to the design and strength of the plate and do not conform to the indications.

Case 1

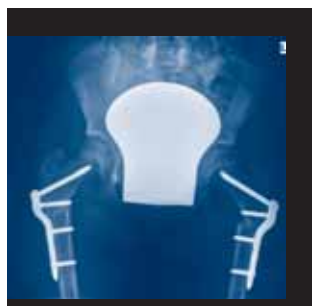
11 year old girl, severe in-toeing which was the reason for clarification. The diagnosis shows poor coverage of both hip joints and strong valgus deformation of the femoral necks. Since the strong valgus deformation was the main component and the parents refused a pelvic osteotomy, the indication was set for a varisation and derotation intertrochanteric osteotomy. Internal fixation was achieved with a 5.0 LCP Pediatric Hip Plate 110°.



Preoperative, AP view



Postoperative, good containment after bilateral correction of varisation by 30°



6 weeks follow-up, good bone healing



6 month follow-up

Case 2

3 year old, slightly retarded girl, unstable hip. Radiologic clarification shows subluxation with dysplastic hip cup and extremely high valgus. A bilateral varisation osteotomy was planned and performed with a 3.5 LCP Pediatric Hip Plate 110°, combined with a triple osteotomy of the right pelvis. A bilateral pelvic osteotomy is not indicated due to high pelvis instability.



Preoperative, AP view and abduction



Postoperative, good containment



6 weeks follow-up, good healing without cast



7 month follow-up, complete healing and remodelling of the osteotomy

Case 3

16 year old, tall boy with severe out-toeing. Internal and external rotation of the hip 0–10–100. With a good coverage of the hip, the patient and his parents requested a correction of the rotation. Internal fixation was achieved with a 5.0 LCP Pediatric Hip Plate 120° (trauma plate).



Preoperative, reduced anteversion, respectively retroversion



Postoperative, rotation by 20°



5 month follow-up, good consolidation

Case 4

10 year old, girl with hiperlaxity dislocated hip. Genetic disease. Femoral osteotomy: derotation + degra acetabular osteotomy.



Preoperative



Postoperative



6 weeks postoperative



6 month postoperative

Case 5

14 year old, girl with diplegic. Walking. Derotation Varisation femoral osteotomy.



Preoperative



Postoperative control



6 weeks postoperative

Fixed Neck/Shaft (CCD) Angle and Calculated Neck/Shaft (CCD) Angle

The LCP Pediatric Hip Plate System can be implanted using two different surgical techniques. The surgeon has to decide before the preoperative planning which technique to use. Only one step is different in the surgical technique, all other steps are similar.

The appropriate plate (size and screw angle must be determined before the surgery) must be selected. All plates are available with one offset (8 mm for the 3.5 plates and 10 mm for the 5.0 plates). Additional medialization can be created with a special instrument (see page 28).

Surgical technique with fixed neck/shaft (CCD) angle

In this technique the plate/screw angle defines the final neck shaft angle as the screws are inserted along the axis of the femoral neck. It is suitable when the final angle desired conforms to one of the plate angles.

Determine the final neck/shaft angle

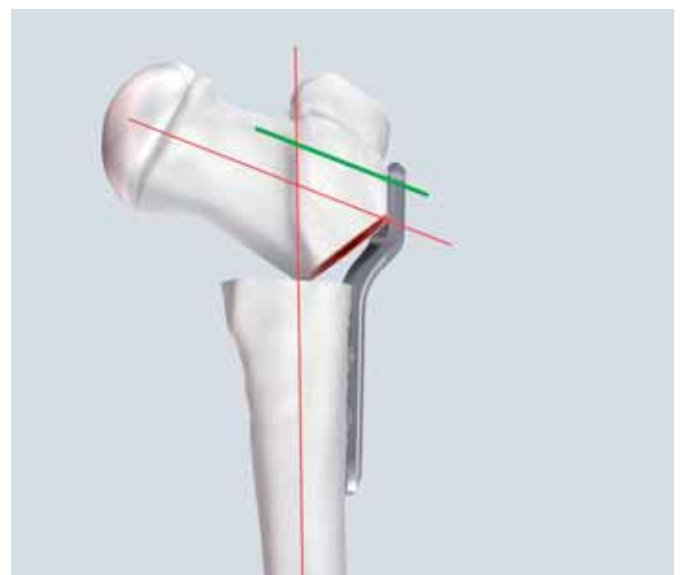
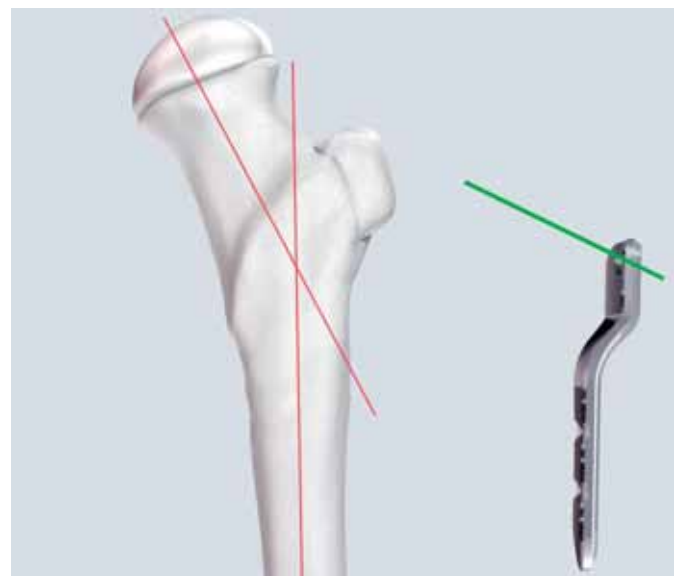
Prior to surgery the surgeon determines which neck/shaft angle has to be achieved after surgery. Further calculations are not necessary.

- Varus osteotomy 100° or 110°
- Valgus osteotomy 150°

Determine the plate size

The size of the implant is determined on the basis of the age, the weight, the size and the bone structure:

- Small fragment plate 3.5: Up to 35 kg / 2 to 8 years
- Large fragment plate 5.0: Up to 55 kg / 8 to 16 years



Surgical technique with calculated neck/shaft (CCD) angle

This technique is used when the desired final neck shaft angle is not one of the plate/screw angles. The technique is derived from the original osteotomy technique described by Mueller (see page 40).

Determine the neck/shaft angle

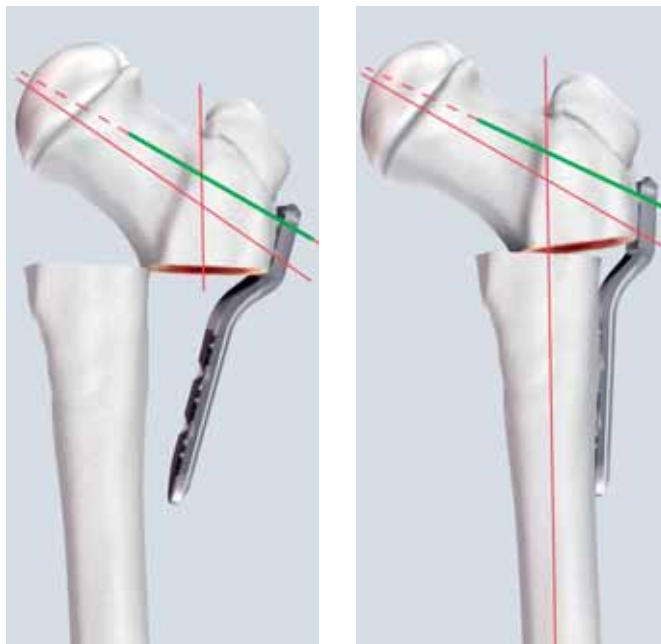
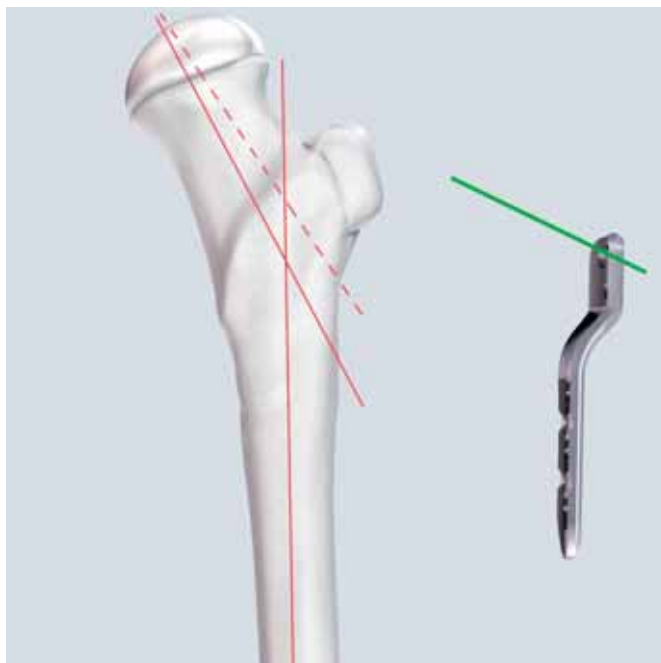
The surgeon has to determine the preoperative and the desired neck/shaft angle after surgery and then calculate the correction angle. To prevent rotational error the angle must be measured on a view with anteversion and retroversion eliminated.

Correction angle = neck/shaft angle preoperative minus neck/shaft angle postoperative

Determine the plate size

The size of the implant is determined on the basis of the age, the weight, the size and the bone structure:

- Small fragment plate 3.5: Up to 35 kg / 2 to 8 years
- Large fragment plate 5.0: Up to 55 kg / 8 to 16 years

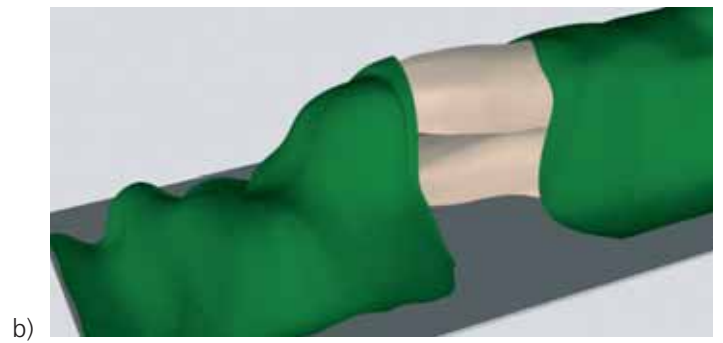
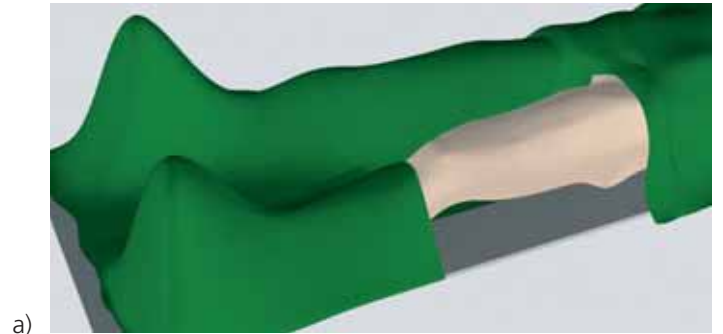


Patient Positioning

1

Position the patient

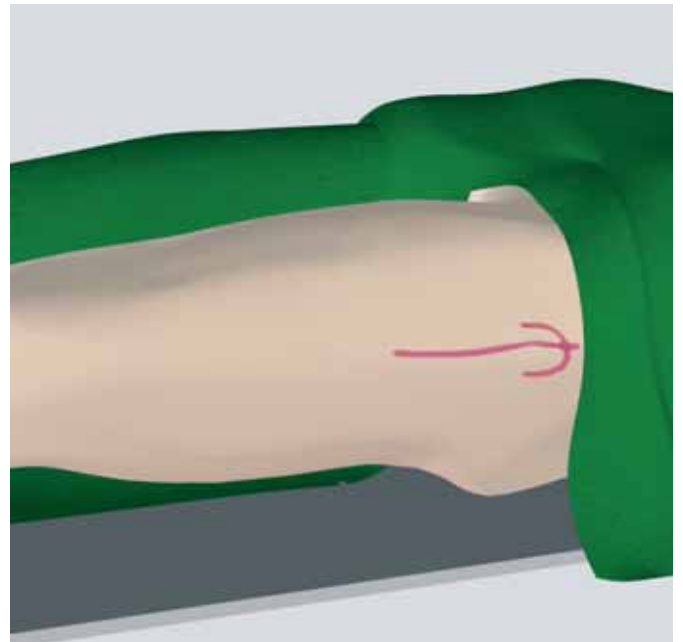
Position the patient supine (a) or lateral (b) on the radiolucent table. Then position the image intensifier so that the visualization of the hip is possible in AP and axial view.



2

Approach

Use a standard lateral approach to the proximal femur.



Determine Plate Position

This surgical technique describes a varus osteotomy of the proximal femur with 110° as the defined final neck/shaft angle (corresponds to plate 3.5, Art.No. 02.108.311).

The surgical technique refers to screw holes where applicable. Please see the designation of each hole as marked on the right side.



1

Localize the trochanteric epiphysis and determine the anteversion

Instrument

292.790 Kirschner Wire \varnothing 2.0 mm with threaded tip, length 150/15 mm, Stainless Steel

Localize the trochanteric epiphysis and mark it with a needle or Kirschner wire. Place Kirschner wire on the ventral side of the femoral neck to determine the anteversion with the image intensifier. To facilitate step 2 (page 13) place that Kirschner wire exactly parallel to the centerline of the femoral neck.



2a

Insert positioning Kirschner wire (fixed neck/shaft angle technique)

Instrument

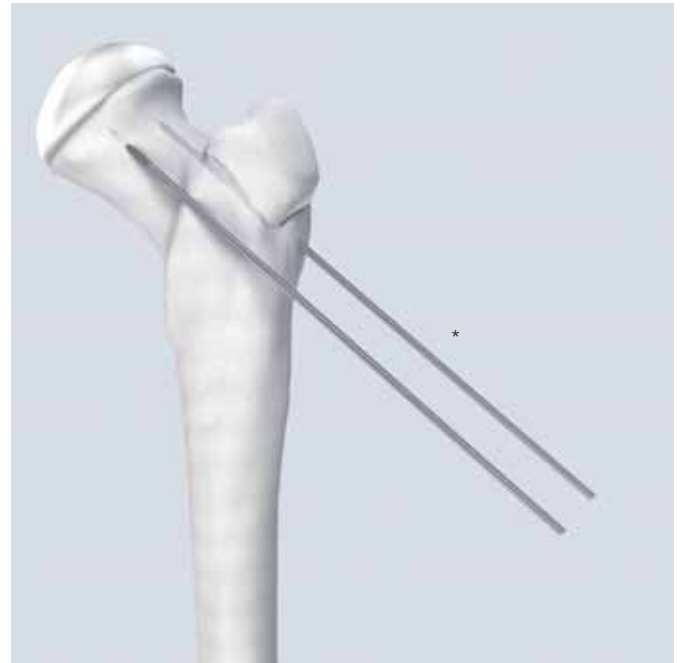
292.790	Kirschner Wire \varnothing 2.0 mm with threaded tip, length 150/15 mm, Stainless Steel
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Insert the positioning Kirschner wire parallel to the initial positioned anteversion guide wire and absolutely parallel to the femoral neck centerline (axis) so that the Kirschner wire corresponds exactly with the CCD and the AT Angle.

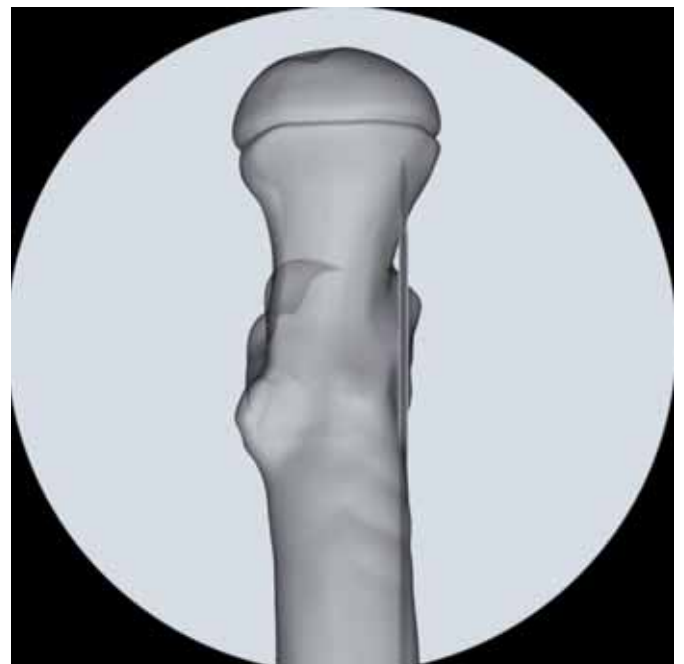
The entry point is 4–5 mm distal to the trochanteric epiphysis in AP view and in line with the femoral neck centerline in axial view. Verify the optimal placement of the Kirschner wire with the image intensifier.

① with the image intensifier.

Important: All following steps refer to the positioning Kirschner wire, therefore the exact position is crucial for a successful surgery.



* Positioning Kirschner Wire



2b

Insert positioning Kirschner wire (calculated neck/shaft angle technique)

Instruments

292.790	Kirschner Wire \varnothing 2.0 mm with threaded tip, length 150/15 mm, Stainless Steel
03.108.001	Aiming Block for Screws \varnothing 3.5 mm, for LCP Paediatric Hip Plates
03.108.006	Positioner for Aiming Block
314.070	Screwdriver, hexagonal, small, \varnothing 2.5 mm, with Groove

Insert the positioning Kirschner wire:

1. In a calculated angle in AP view. This angle is calculated from the preoperatively determined correction (varus or valgus) and the screw angle of the chosen plate.
2. Parallel to the initial positioned anteversion guide wire and in line with the femoral neck centerline (axis) in axial view so that the Kirschner wire corresponds with the AT Angle.

For varus correction

Positioning Kirschner wire angle = correction angle plus screw angle

Example:

Varus correction of 25° with a 110° varus plate

Positioning wire angle = $25^\circ + 110^\circ = 135^\circ$

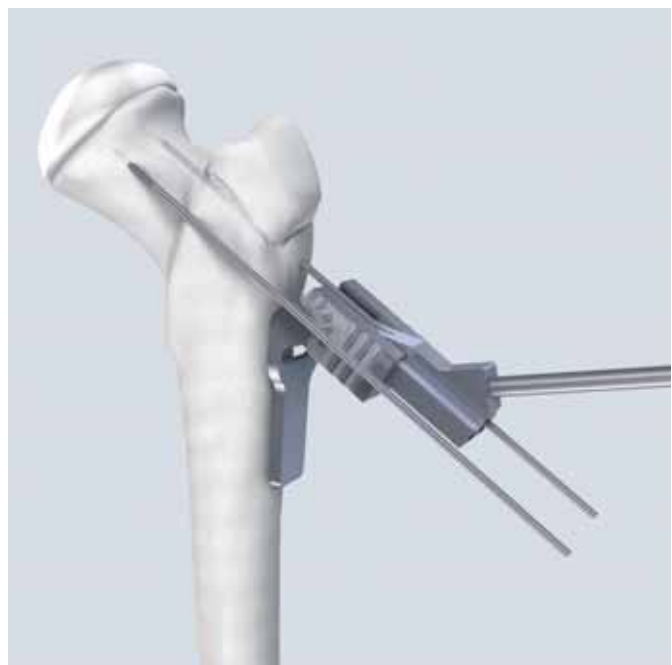
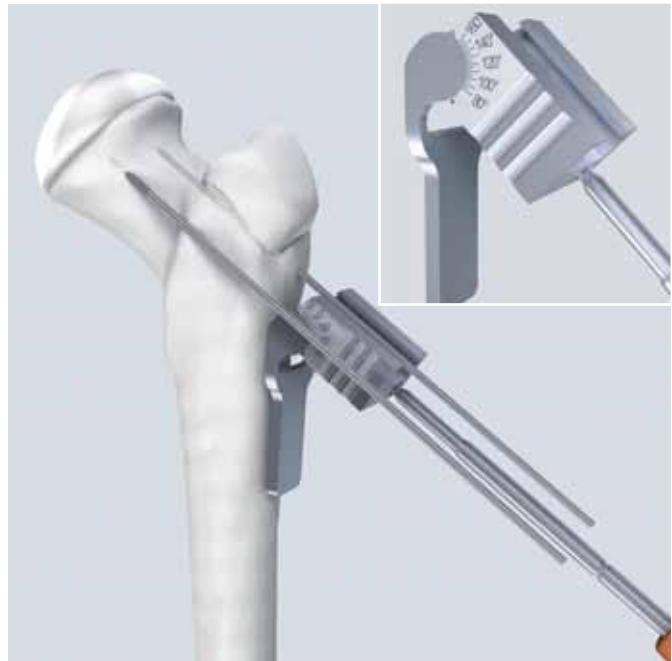
For valgus correction

Positioning wire angle = screw angle minus correction angle

Example:

Valgus correction of 20° with a 150° valgus plate

Positioning wire angle = $150^\circ - 20^\circ = 130^\circ$



Positioning Kirschner Wire

Set the angle on the positioner for aiming block. First insert the positioner, then the aiming block and assemble them. Insert the positioning Kirschner wire.

The entry point is 4–5 mm distal to the trochanteric epiphysis in AP view and in line with the femoral neck centerline in axial view.

- Verify the optimal placement of the Kirschner wire with the image intensifier.

Important: All following steps refer to the positioning Kirschner wire, therefore the exact position is crucial for a successful surgery.

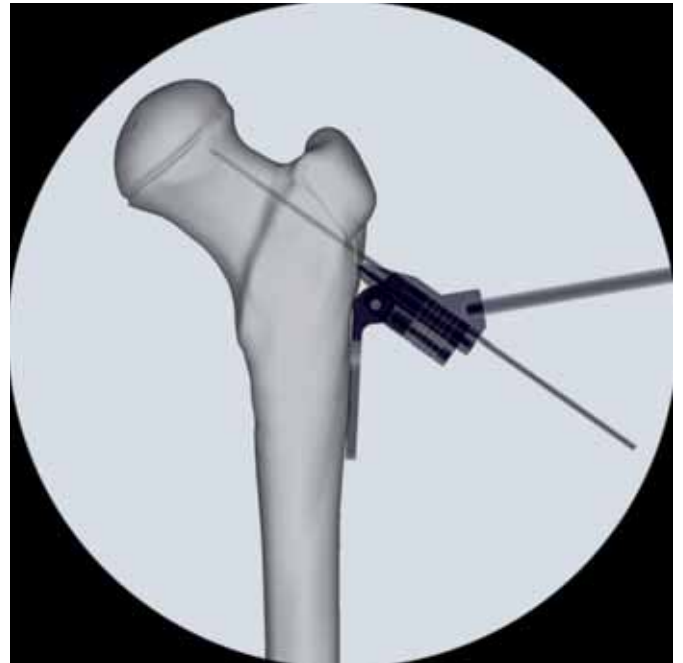


Plate with 5.0 mm Screws

Instrument

03.108.002	Aiming Block for Screws \varnothing 5.0 mm, for LCP Pediatric Hip Plates
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3

Determine proximal screw position

Instruments

03.108.001	Aiming Block for Screws \varnothing 3.5 mm, for LCP Pediatric Hip Plates
03.108.005	Kirschner Wire \varnothing 2.8 mm with spade point tip
03.108.006	Positioner for Aiming Block

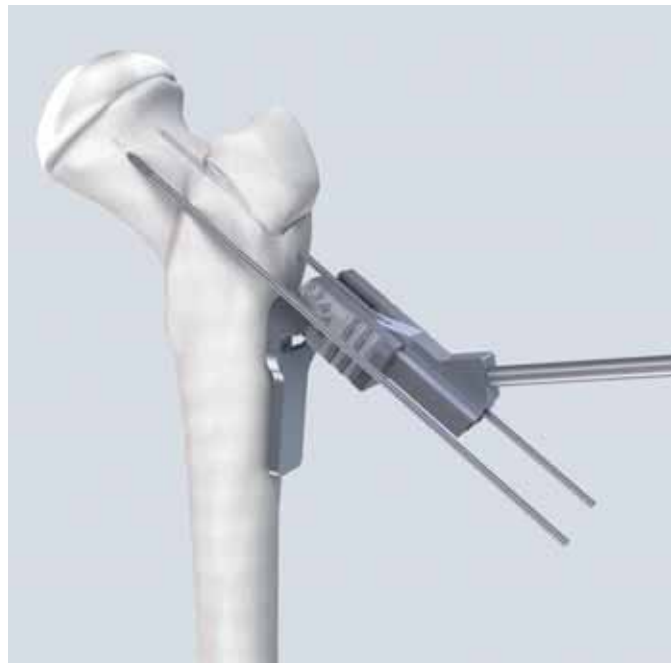
With the femoral head Kirschner wires, the position and the length of the screws are defined and at the same time the holes are pre-drilled for the 3.5 mm plates, not for the 5.0 mm plates.

First insert the positioner for aiming block, ensuring the shaft side arm screw is not tightened as this makes it hard to insert. Slide the aiming block over the positioning Kirschner wire and assemble it with the positioner for aiming block. Do not bend the Kirschner wire while sliding the aiming block over the Kirschner wire.

Insert the two superior proximal femoral Kirschner wires one by one with help of the aiming block as close as possible to the growth plate (distance to the growth plate 5 mm) to assure an optimal screw length. When the Kirschner wires are inserted correctly, remove aiming block, positioner and the anteversion Kirschner wire.

Notes

- The aiming block can be used with or without the positioner. Its use is recommended because it allows the definition of any flexion or extension required in the osteotomy.
- Do not bend the positioning Kirschner wire with the aiming block while inserting the Kirschner wires. That causes correction mistakes.
- The two front spikes must be in contact with the femur.



- ⓘ **Important:** verify the optimal position of the Kirschner wires with the image intensifier in AP, and axial view.

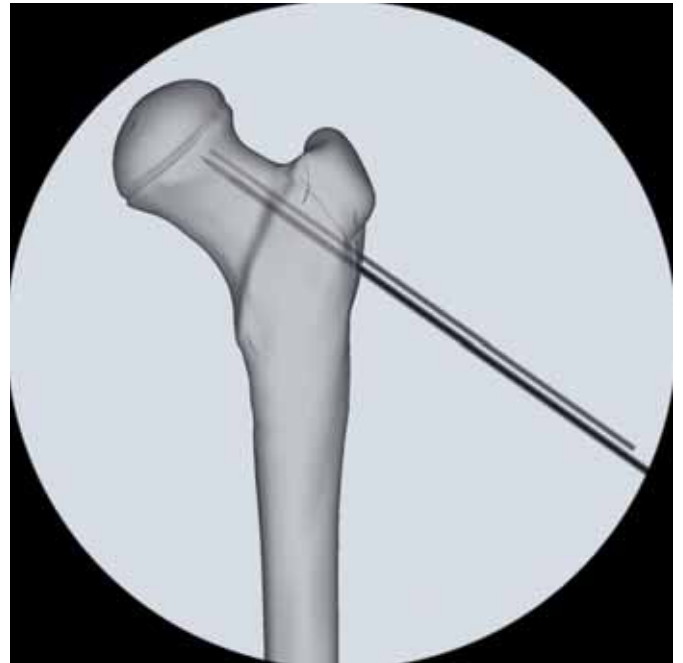
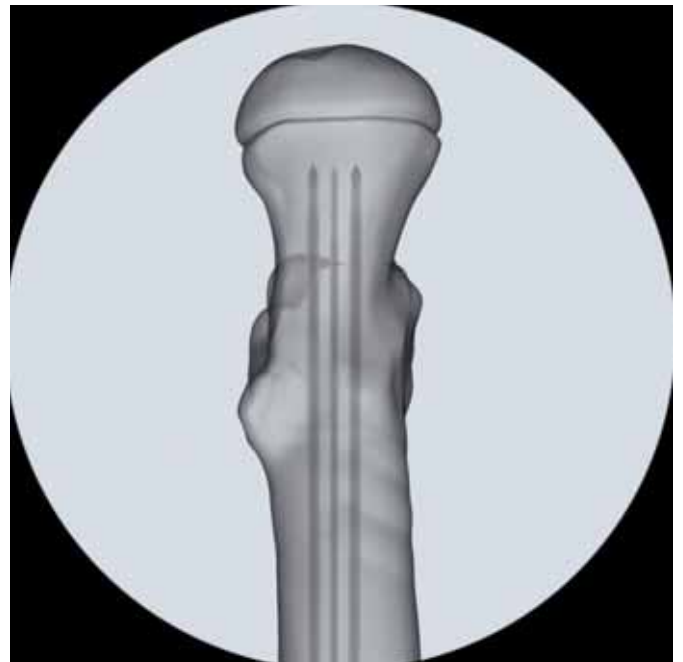


Plate with 5.0 mm screws

Instrument

03.108.002 Aiming Block for Screws \varnothing 5.0 mm, for
LCP Pediatric Hip Plates



Osteotomy

Instrument

03.108.008 Positioner for Osteotomy

The optimal position of the osteotomy is 10 mm distal to the femoral head Kirschner wires. The distance is determined with the positioner for osteotomy. Hold the positioner for osteotomy against the two femoral head Kirschner wires and mark the distance with the oscillating saw or another sharp instrument on the bone.

The osteotomy is performed completely in one cut with an oscillating saw in a right angle to the axis of the femoral shaft.

Important: In case of a planned derotation or rotation osteotomy, insert Kirschner wires into the greater trochanter and the distal fragment (either the shaft or the knee) to control the derotation or rotation. Even if no derotation or rotation is planned it is recommended to insert the two guide wires or to make a mark onto the bone (see picture). This ensures that the two bone fragments are fixed in the right position.



Proximal Fixation

In osteotomies the fixation in the proximal fragment must always be with locking screws. In proximal femoral fractures compression may be desired, in which case regular cortical or cancellous screws can be used (select the appropriate size for the plate).

1

Position of the plate

Instrument

03.108.009	LCP Drill Sleeve 3.5, for Drill Bits Ø 2.8 mm, for LCP Pediatric Hip Plate
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Insert the drill sleeves into the two proximal plate holes. Then slide the plate over the two femoral head Kirschner wires and the positioning Kirschner wire. If the positioning Kirschner wire was removed, it has to be placed in hole D again, because it is used as an antirotational protection, during screw insertion.

Tip: Fix the proximal fragment (femoral neck/head fragment) with forceps taking care not to disturb the positioning of the plate. This gives a better handling of the proximal fragment and safety in terms of rotation.

Plate with 5.0 mm screws

Instruments

03.108.010	LCP Drill Sleeve 5.0, for Drill Bits Ø 4.3 mm, for LCP Pediatric Hip Plate
03.108.004	Reduction Sleeve 4.3/2.8

Note: For all plates 5.0 an additional reduction sleeve must be inserted in each LCP drill sleeve before sliding the plate over the wires.



2

Insert the femoral neck screws A and B

Instruments

03.108.003	Direct Measuring Device for Kirschner Wires \varnothing 2.8 mm, length 200 mm
511.770	Torque Limiter, 1.5 Nm, for Compact Air Drive and for Power Drive
314.030	Screwdriver Shaft, hexagonal, small, \varnothing 2.5 mm or
314.116	Screwdriver Shaft Stardrive 3.5, T15, self-holding, for AO/ASIF Quick Coupling
397.705	Handle for Torque Limiter Nos. 511.770 and 511.771

Determine the screw length by measuring the insertion depth of the Kirschner wire with the direct measuring device for Kirschner wires. Slide the appropriate end of the measuring device over the Kirschner wire against the LCP drill sleeve and determine the proper screw length which will typically be the next size smaller than what was measured. Remove the LCP drill sleeve and the Kirschner wire in hole A. If necessary use the wrench at one end of the positioner for osteotomy. Insert the screw in hole A.

Manual insertion

To insert the locking screw manually, attach the handle for torque limiter to the torque limiter and insert a screwdriver shaft. Insert the locking screw, and lock it in the plate. After one click, the optimum torque is reached.



Insertion with a power tool

To insert the locking screw using a power tool, mount a torque limiter to the power tool. Then insert the screwdriver shaft into the torque limiter.

Pick up the locking screw and insert it into the plate hole. To insert the screw, start the power tool slowly, increase the speed and then reduce it again before the screw is fully tightened.

Uncouple the power tool, mount the handle and manually tighten the screw. After one click, the optimum torque is reached.

Insert the screw in hole B in the same way as in hole A. Then remove the positioning Kirschner wire in hole D.

Plate with 5.0 mm screws

Instruments

310.430	LCP Drill Bit \varnothing 4.3 mm with Stop, length 221 mm, 2-flute, for Quick Coupling
511.771	Torque Limiter, 4 Nm, for Compact Air Drive and Power Drive
314.152	Screwdriver Shaft 3.5, hexagonal, self-holding or
314.164	Screwdriver Shaft Stardrive 3.5, T15, self-holding, for AO/ASIF Quick Coupling
397.705	Handle for Torque Limiter Nos. 511.770 and 511.771

Important: Remove the reduction sleeve and enlarge the hole from 2.8 mm to 4.3 mm with the LCP drill bit. Then follow the instructions as described in step 2.



3**Insert the screw in hole C****Instruments**

310.284	LCP Drill Bit \varnothing 2.8 mm with Stop, length 221 mm, 2-flute, for Quick Coupling
03.108.009	LCP Drill Sleeve 3.5, for Drill Bits \varnothing 2.8 mm, for LCP Pediatric Hip Plate
319.010	Depth Gauge for Screws \varnothing 2.7 to 4.0 mm, measuring range up to 60 mm
511.770	Torque Limiter, 1.5 Nm, for Compact Air Drive and for Power Drive
314.030	Screwdriver Shaft, hexagonal, small, \varnothing 2.5 mm
314.116	Screwdriver Shaft Stardrive 3.5, T15, self-holding, for AO/ASIF Quick Coupling

Mount the LCP Drill sleeve onto hole C and drill the hole for the calcar screw with a LCP drill bit \varnothing 2.8 mm through both cortices. Remove the LCP drill sleeve and determine the screw length with the depth gauge. Insert the screw in hole C.



Plate with 5.0 mm screws

Instruments

310.430	LCP Drill Bit \varnothing 4.3 mm with Stop, length 221 mm, 2-flute, for Quick Coupling
03.108.010	LCP Drill Sleeve 5.0, for Drill Bits \varnothing 4.3 mm, for LCP Pediatric Hip Plate
319.100	Depth Gauge for Screws \varnothing 4.5 to 6.5 mm, measuring range up to 110 mm
511.771	Torque Limiter, 4 Nm, for Compact Air Drive and Power Drive
314.152	Screwdriver Shaft 3.5, hexagonal, self-holding
314.162	Screwdriver Stardrive 4.5/5.0, T25, with Groove, length 240 mm



4**Reduction****Instruments**

03.108.009	LCP Drill Sleeve 3.5, for Drill Bits Ø 2.8 mm, for LCP Pediatric Hip Plate
399.121	Bone Holding Forceps, self-centering, soft lock, length 239 mm

The plate must be aligned distally to the axis of the femoral shaft. When the plate is satisfactorily aligned, fix it with the reduction forceps.



Important: If the plate is not aligned exactly parallel to the femoral shaft it can lead to variations of the planned neck/shaft (CCD) angle.

Tip: The alignment can be facilitated with LCP drill sleeves in the distal part of the plate and/or with a forceps fixed on the proximal part. These instruments serve as handles during the repositioning of the osteotomy.

Plate with 5.0 mm screws**Instruments**

03.108.010	LCP Drill Sleeve 5.0, for Drill Bits Ø 4.3 mm, for LCP Pediatric Hip Plate
399.121	Bone Holding Forceps, self-centering, soft lock, length 239 mm



Distal Fixation

Distal fixation with locking screws

Insert locking screws in hole 1, 2 and 3.

Instruments

314.030	Screwdriver Shaft, hexagonal, small, Ø 2.5 mm
	or
314.116	Screwdriver Shaft Stardrive 3.5, T15, self-holding, for AO/ASIF Quick Coupling
319.010	Depth Gauge for Screws Ø 2.7 to 4.0 mm, measuring range up to 60 mm
511.770	Torque Limiter, 1.5 Nm, for Compact Air Drive and for Power Drive
397.705	Handle for Torque Limiter Nos. 511.770 and 511.771
03.108.009	LCP Drill Sleeve 3.5, for Drill Bits Ø 2.8 mm, for LCP Paediatric Hip Plate
310.284	LCP Drill Bit Ø 2.8 mm with Stop, length 165 mm, 2-flute, for Quick Coupling

Screw the LCP drill sleeve into LCP hole 1, 2 and 3 until it is gripped completely by the thread. Drill the screw hole using an appropriate drill bit. Remove the drill sleeve. Determine the screw length with the depth gauge or with the stop ring from the laser mark on the drill bit before removing the drill sleeves. Then follow the instructions as described in step 2.



Plate with 5.0 mm screws

Instruments

314.152	Screwdriver Shaft 3.5, hexagonal, self-holding or
314.119	Screwdriver Shaft Stardrive 4.5/5.0, T25, self-holding, for AO/ASIF Quick Coupling
319.100	Depth Gauge for Screws \varnothing 4.5 to 6.5 mm, measuring range up to 110 mm
03.108.010	LCP Drill Sleeve 5.0, for Drill Bits \varnothing 4.3 mm, for LCP Paediatric Hip Plate
310.430	LCP Drill Bit \varnothing 4.3 mm with Stop, length 221 mm, 2-flute, for Quick Coupling
511.771	Torque Limiter, 4 Nm, for Compact Air Drive and Power Drive
397.705	Handle for Torque Limiter Nos. 511.770 and 511.771

Distal fixation with cortex screws

Instruments

314.070	Screwdriver, hexagonal, large, Ø 3.5 mm, with Groove, length 240 mm
314.030	Screwdriver Shaft, hexagonal, small, Ø 2.5 mm
314.041	or Screwdriver Stardrive 3.5, T15, with Groove, length 200 mm
314.116	or Screwdriver Shaft Stardrive 3.5, T15, self-holding, for AO/ASIF Quick Coupling
319.010	Depth Gauge for Screws Ø 2.7 to 4.0 mm, measuring range up to 60 mm
312.280	Double Drill Guide 3.5/2.5

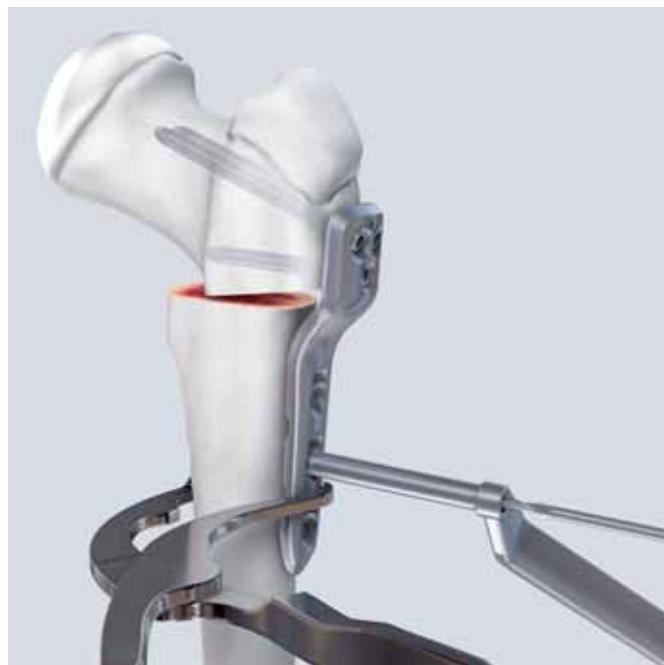
Insert screws in hole 1, 2 and 3.

Predrill with the appropriate drill in the plate hole 1, 2 and 3 a hole. Measure the screw length with the depth gauge and place a self-tapping cortex screw in hole 1, 2 and 3.

Plate with 5.0 mm Screws

Instruments

314.270	Screwdriver, hexagonal, large, Ø 3.5 mm, with Groove, length 240 mm
314.152	or Screwdriver Shaft 3.5, hexagonal, self-holding
314.164	or Screwdriver Stardrive 4.5/5.0, T25, with Groove, length 240 mm
314.119	or Screwdriver Shaft Stardrive 4.5/5.0, T25, self-holding, for AO/ASIF Quick Coupling
312.460	Double Drill Guide 4.5/3.2
319.100	Depth Gauge for Screws Ø 4.5 to 6.5 mm, measuring range up to 110 mm



Medialization

Medialization is only possible if the distal part is fixed with locking screws.

Instruments

314.030	Screwdriver Shaft, hexagonal, small, Ø 2.5 mm or
314.116	Screwdriver Shaft Stardrive 3.5, T15, self-holding, for AO/ASIF Quick Coupling
319.010	Depth Gauge for Screws Ø 2.7 to 4.0 mm, measuring range up to 60 mm
511.770	Torque Limiter, 1.5 Nm, for Compact Air Drive and for Power Drive
03.108.007	Instrument for Medialization
03.108.009	LCP Drill Sleeve 3.5, for Drill Bits Ø 2.8 mm, for LCP Paediatric Hip Plate
310.284	LCP Drill Bit Ø 2.8 mm with Stop, length 165 mm, 2-flute, for Quick Coupling
397.705	Handle for Torque Limiter Nos. 511.770 and 511.771

Adjust the desired medialization with the instrument for medialization. Screw the correct ends of these instruments into the locking portion of LCP holes 1 and 3 until they are firmly gripped. Then screw an LCP drill sleeve into LCP hole 2 until it is gripped completely by the thread. Drill the screw hole and remove the drill sleeve. Determine the screw length with the depth gauge and insert a locking screw. Remove the instrument for medialization in hole 1 and insert a locking screw. Proceed in the same way in hole 3.



Plate with 5.0 mm Screws

Instruments

314.152	Screwdriver Shaft 3.5, hexagonal, self-holding
314.119	Screwdriver Shaft Stardrive 4.5/5.0, T25, self-holding, for AO/ASIF Quick Coupling
319.100	Depth Gauge for Screws \varnothing 4.5 to 6.5 mm, measuring range up to 110 mm
511.771	Torque Limiter, 4 Nm, for Compact Air Drive and Power Drive
03.108.007	Instrument for Medialization
03.108.010	LCP Drill Sleeve 5.0, for Drill Bits \varnothing 4.3 mm, for LCP Paediatric Hip Plate
310.430	LCP Drill Bit \varnothing 4.3 mm with Stop, length 221 mm, 2-flute, for Quick Coupling
397.705	Handle for Torque Limiter Nos. 511.770 and 511.771

Special considerations

Implant removal

Rotation osteotomy

If a pure rotation osteotomy is required with no correction of the neck/shaft angle, the femoral head Kirschner wires must be inserted at 120° to the shaft of the femur. In practice this can be achieved by using the aiming block, similar to the other plates, or by using the selected plate as the aiming block for the proximal guide wire and the femoral head Kirschner wires. This ensures that there is no inadvertent alteration of the neck/shaft angle.

Proximal femoral fractures

The fixation of fractures depends on the configuration and nature of the fracture. The surgeon needs to make a preoperative plan from the initial X-rays. In fracture fixation it may be desirable to insert one or more compression screws through the proximal plate holes. After compression has been achieved angular stability can be ensured using locking screws.

Remember: After a locking screw has been inserted a compression screw should not be inserted into the same fragment (according to the LCP principles).

Implant removal

Do not remove the implant before the complete consolidation of the osteotomy is visible on the x-ray. The average time of consolidation is approximately 6–8 months.

Implants

Small fragment plates (3.5 mm)

02.108.310 LCP Paediatric Hip Plate 3.5, 100°,
length 75 mm, width 18.5 mm



02.108.311 LCP Paediatric Hip Plate 3.5, 110°,
length 75 mm, width 18.5 mm



02.108.313 LCP Paediatric Hip Plate 3.5, 120°,
length 75 mm, width 18.5 mm



02.108.315 LCP Paediatric Hip Plate 3.5, 150°,
length 60 mm, width 18.5 mm



Large fragment plates (5.0 mm)

02.108.320 LCP Paediatric Hip Plate 5.0, 100°,
length 90 mm, width 22.5 mm



02.108.321 LCP Paediatric Hip Plate 5.0, 110°,
length 90 mm, width 22.5 mm



02.108.323 LCP Paediatric Hip Plate 5.0, 120°,
length 95 mm, width 22.5 mm



02.108.325 LCP Paediatric Hip Plate 5.0, 150°,
length 75 mm, width 22.5 mm



Instruments

03.108.001 Aiming Block for Screws \varnothing 3.5 mm,
for LCP Paediatric Hip Plates



03.108.002 Aiming Block for Screws \varnothing 5.0 mm,
for LCP Paediatric Hip Plates



03.108.003 Direct Measuring Device for Kirschner
Wires \varnothing 2.8 mm, length 200 mm



03.108.004 Reduction Sleeve 4.3/2.8



03.108.005 Kirschner Wire \varnothing 2.8 mm with spade point tip



03.108.006 Positioner for Aiming Block



03.108.007 Instrument for Medialization



03.108.008 Positioner for Osteotomy



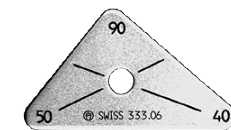
03.108.009 LCP Drill Sleeve 3.5, for Drill Bits
Ø 2.8 mm, for LCP Paediatric Hip Plate



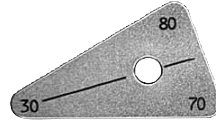
03.108.010 LCP Drill Sleeve 5.0, for Drill Bits
Ø 4.3 mm, for LCP Paediatric Hip Plate



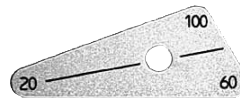
333.060 Positioning Plate, triangular, length
45 mm, 90°/50°/40°



333.070 Positioning Plate, triangular, length 45 mm, 80°/70°/30°



333.080 Positioning Plate, triangular, length 45 mm, 100°/60°/20°



399.121 Bone Holding Forceps, self-centering, soft lock, length 239 mm



399.124 Reduction Forceps, toothed, soft lock, length 250 mm



397.705 Handle for Torque Limiter Nos. 511.770 and 511.771



310.284 LCP Drill Bit Ø 2.8 mm with Stop, length 165 mm, 2-flute, for Quick Coupling



310.250	Drill Bit \varnothing 2.5 mm, length 110/85 mm, 2-flute, for Quick Coupling	
310.280	Drill Bit \varnothing 2.7 mm, length 125/100 mm, 2-flute, for Quick Coupling	
312.280	Double Drill Guide 3.5/2.5	
319.010	Depth Gauge for Screws \varnothing 2.7 to 4.0 mm, measuring range up to 60 mm	
314.070	Screwdriver, hexagonal, small, \varnothing 2.5 mm, with Groove	
314.030	Screwdriver Shaft, hexagonal, small, \varnothing 2.5 mm	

310.430 LCP Drill Bit \varnothing 4.3 mm with Stop, length 221 mm, 2-flute, for Quick Coupling



310.310 Drill Bit \varnothing 3.2 mm, length 145/120 mm, 2-flute, for Quick Coupling



312.460 Double Drill Guide 4.5/3.2



319.100 Depth Gauge for Screws \varnothing 4.5 to 6.5 mm, measuring range up to 110 mm



314.270 Screwdriver, hexagonal, large, \varnothing 3.5 mm, with Groove, length 240 mm



314.152 Screwdriver Shaft 3.5, hexagonal, self-holding



511.770 Torque Limiter, 1.5 Nm, for Compact Air Drive and for Power Drive



511.771 Torque Limiter, 4 Nm, for Compact Air Drive and Power Drive



Instruments for screws with Stardrive recess

314.041 Screwdriver Stardrive 3.5, T15, with Groove, length 200 mm



314.116 Screwdriver Shaft Stardrive 3.5, T15, self-holding, for AO/ASIF Quick Coupling



314.119 Screwdriver Shaft Stardrive 4.5/5.0, T25, self-holding, for AO/ASIF Quick Coupling



314.164 Screwdriver Stardrive 4.5/5.0, T25, with Groove, length 240 mm



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Synthes GmbH
Eimattstrasse 3
CH-4436 Oberdorf
www.synthes.com

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