3.5 mm LCP® Medial Distal Tibia Plate

TECHNIQUE GUIDE

SYNTHES®

Original Instruments and Implants of the Association for the Study of Internal Fixation — AO ASIF

3.5 mm LCP® Medial Distal Tibia Plate

Foreword

The 3.5 mm LCP® Medial Distal Tibia Plate is part of the Synthes Small Fragment LCP System that merges locking screw technology with conventional plating techniques. The plate is stainless steel and features a limited-contact shaft profile, locking compression plate (LCP) holes in the shaft, and locking screw holes in the head. The LCP holes in the plate shaft combine a dynamic compression unit (DCU) hole with a locking screw hole. The LCP hole provides the flexibility of axial compression and locking capability throughout the length of the plate shaft.

Fixation with the 3.5 mm LCP Medial Distal Tibia Plate has many similarities to traditional plate fixation methods, with a few important improvements. The technical innovation of locking screws provides the ability to create a fixed-angle construct while using familiar AO plating techniques. Locking capability is important for fixed-angle constructs in osteopenic bone or multifragmentary fractures where screw purchase is compromised. These screws do not rely on plate-to-bone compression to resist patient load, but function similarly to multiple, small, angled blade plates.

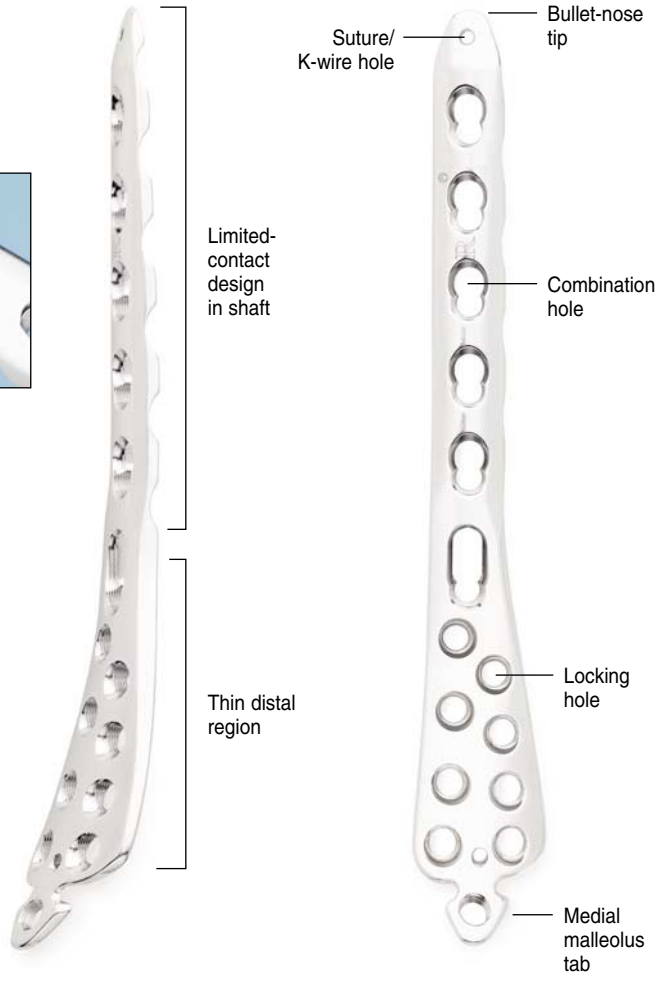
Indications

- Extra-articular and intra-articular distal tibia fractures
- Osteotomies of the distal tibia

Note: *For information on fixation principles using conventional and locked plating techniques, please refer to the* Small Fragment Locking Compression Plate (LCP) Technique Guide.

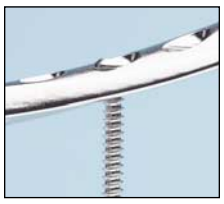
Plate Features

- Anatomically contoured; plate is twisted 20° and bent to fit the distal tibia
- Available for left and right tibias
- Limited-contact shaft design with 4 to 14 combination locking/compression holes
- Eight distal locking holes accept 2.7 mm Cortex, 3.5 mm Locking, 3.5 mm Cortex, or 4.0 mm Cancellous Bone Screws
- Proximal and distal holes for 1.6 mm or 2.0 mm Kirschner wires
- 316L stainless steel
- Locking holes in distal region are parallel to the joint
- Elongated hole in shaft aids in initial plate positioning
- The shaft holes accept 3.5 mm Locking Screws in the threaded portion and 3.5 mm Cortex Screws, 4.0 mm Cortex Screws and 4.0 mm Cancellous Bone Screws in the compression portion
- Distal tab for optional medial malleolus screw accepts 3.5 mm Locking, 2.7 mm Cortex, 3.5 mm Cortex, 4.0 mm Cortex or 4.0 mm Cancellous Bone Screws

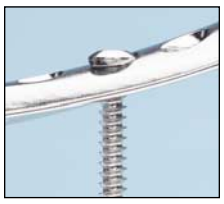


Distal Screw Profile

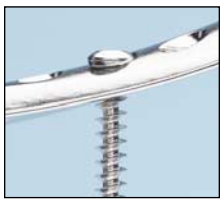
3.5 mm Locking



2.7 mm Cortex



3.5 mm Cortex



4.0 mm Cancellous

The AO ASIF Principles of Internal Fixation

Anatomic Reduction

Facilitates restoration of the articular surface by exact screw placement utilizing wire sleeves. Precontoured plate assists reduction of metaphysis to diaphysis.

Stable Fixation

Locking screws create a fixed-angle construct, providing angular stability.

Preservation of Blood Supply

Tapered end for submuscular plate insertion, preserving tissue viability.

Limited-contact plate design reduces plate-to-bone contact, limiting vascular trauma and insult to bone.

Early Mobilization

Early mobilization per standard AO technique creates an environment for bone healing, expediting a return to optimal function.

Surgical Technique

1 Preparation

Complete the radiographic assessment and prepare the preoperative plan. For a minimally invasive procedure, use the AO ASIF preoperative planning template to determine plate length and screw positions. Position the patient supine on a radiolucent operating table. Visualization of the distal tibia under fluoroscopy in both the lateral and AP views is necessary.

Required Sets:
The Small Fragment LCP Set [105.434] is required when implanting the 3.5 mm LCP Medial Distal Tibia Plates.

Locking Small Fragment
Instrument and Implant Set–LCP,
with self-tapping screws
105.434

2 Reduce articular surface

Reduce the fracture fragments and confirm reduction using image intensification. Reduction may be stabilized using the following methods:

1. Independent Kirschner Wires
2. K-wires through the plate
3. Independent lag screws
4. Lag screws through the plate
5. Locking screws through the plate

The locking screws do not provide interfragmentary compression; therefore, any desired compression must be achieved with standard lag screws. The articular fractures must be reduced and compressed prior to fixation of the 3.5 mm LCP Medial Distal Tibia Plate with locking screws.

2.7 mm or 3.5 mm Cortex Screws may also be used as lag screws through the plate by overdrilling the near fragment.

Technique Tip: *Prior to reduction, application of an external fixator or Large Distractor [394.35] may facilitate visualization and reduction of the joint.*

Technique Tip: *To verify that independent lag screws will not interfere with plate placement, evaluate placement on the preoperative plan or intraoperatively with AP and lateral fluoroscopic images.*

Insert independent K-wires to reduce fracture fragments.

Surgical Technique (continued)

3 Bend distal tab (optional)

Contour the distal tab as necessary with the Universal Bending Pliers [391.963].

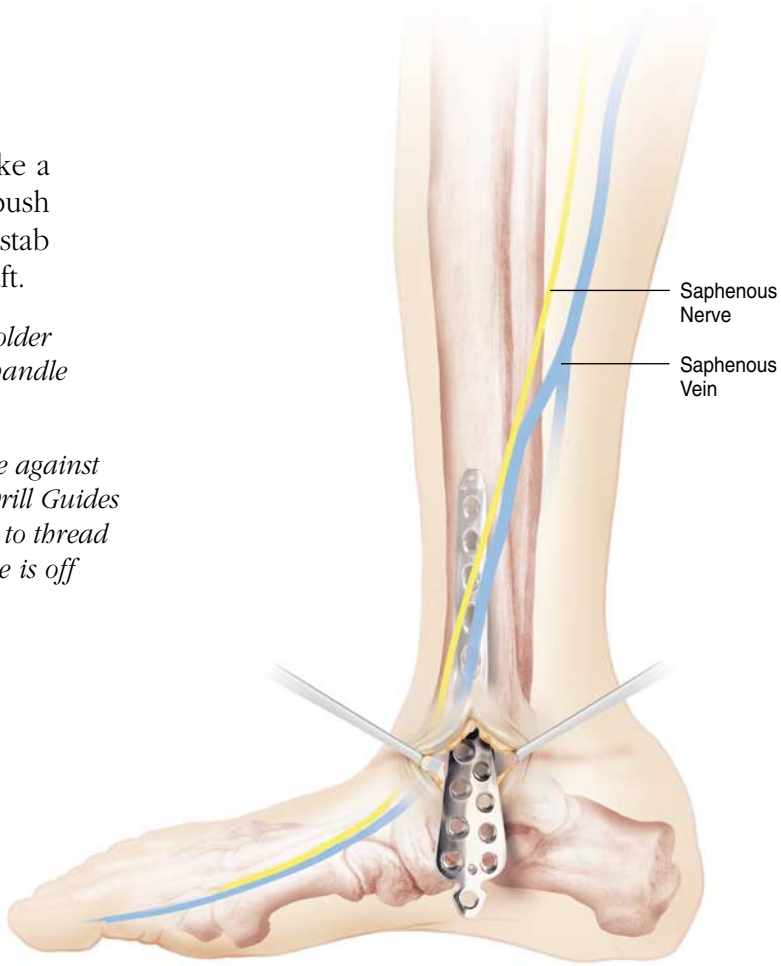
Bend the distal tab to fit the medial malleolus using the Universal Bending Pliers.

4 Insert plate

For minimally invasive insertion, make a single incision distally and carefully push the plate under the soft tissue. Make stab incisions to insert screws into the shaft.

Technique Tip: *Use a Threaded Plate Holder [324.031] in one of the distal holes as a handle for percutaneous insertion.*

Technique Tip: *Prior to placing the plate against the bone, thread the 2.8 mm Threaded Drill Guides [312.648] into the distal holes. It is easier to thread these guides into the plate when the plate is off the bone.*



5 Position plate and fix provisionally

The plate may be temporarily held in place with standard plate holding forceps or the Push-Pull Reduction Device [324.024], to prevent plate rotation while inserting the first locking screw.

K-wires may be used through the plate for provisional fixation.

Assure proper reduction prior to insertion of the first locking screw. Locking screw insertion may prevent any further reduction.

Hold the plate to the bone using the Push-Pull Reduction Device.

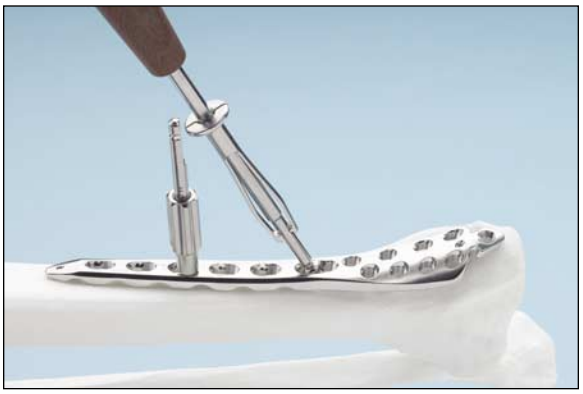
6 Insert screws

Determine the combination of 2.7 mm, 3.5 mm and 4.0 mm Cortex, 4.0 Cancellous Bone Screws, and 3.5 mm Locking Screws that will be used for fixation.

If a combination of cortex and locking screws will be used, cortex screws should be inserted first to pull the plate to the bone.

If using a locking screw as the first screw, be sure the plate is held securely to the bone to prevent plate rotation as the screw is locked to the plate.

Reminder: *The locking screw is not a lag screw. Use standard screws when requiring a precise anatomical reduction (e.g. joint surfaces) or interfragmentary compression. Before inserting the first locking screw, perform anatomical reduction and fix the fracture with lag screws, if necessary. After the insertion of locking screws, an anatomical reduction will no longer be possible without loosening the locking screws.*



Insertion of a lag screw through the elongated hole.

Surgical Technique (continued)

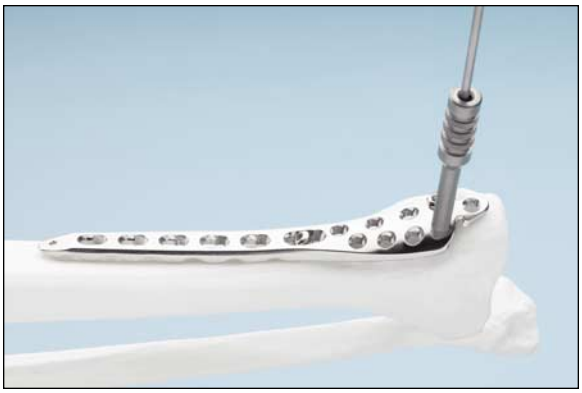
6 Insert screws (continued)

Distal locking screw insertion

- Screw the 2.8 mm Threaded Drill Guide [312.648] into an LCP plate hole until fully seated.
- Use the 2.8 mm Drill Bit [310.288] to drill to the desired depth.
- Remove the drill guide.
- Use the Depth Gauge [319.01] to determine screw length.
- Insert the locking screw under power, using the Torque Limiting Attachment [511.770 or 511.773] and the StarDrive Screwdriver Shaft [314.116], or insert manually, using the StarDrive Screwdriver [314.115].

Note: *When using the Torque Limiting Attachment, the screw is securely locked to the plate when a "click" is heard.*

Warning: *Never use the StarDrive shaft directly with power equipment unless using a Torque Limiting Attachment.*



When inserting 3.5 mm Locking Screws, screw the 2.8 mm Threaded Drill Guide into the hole and then drill with the 2.8 mm Drill Bit.

Measure for screw length using the Depth Gauge.

Insert a 3.5 mm Locking Screw using the StarDrive Screwdriver Shaft and Torque Limiting Attachment. Screws may also be inserted manually using the StarDrive Screwdriver. To prevent plate rotation, be sure the plate is secured to the bone before inserting the first lag screw.

6 Insert screws (continued)

Shaft screw insertion

If using the threaded portion of the LCP holes, repeat the steps for distal locking screw insertion.

For nonlocking screws, use the standard AO screw insertion technique.

Depending on the bone quality, screws through the plate shaft can be either bicortical or unicortical.

Optional Techniques

Medial malleolus screw insertion

If the tab for the medial malleolus screw is to be utilized, insert either a 3.5 mm Locking Screw or a nonlocking 2.7 mm, 3.5 mm, or 4.0 mm Cortex Screw, or a 4.0 mm Cancellous Bone Screw through the screw hole for malleolus fixation. Use the screw insertion techniques previously described.

Insert a screw through the distal tab to secure the medial malleolus.

Screw placement verification

Final position of the locking screws may be verified under image intensification with a K-wire prior to insertion. This is especially important when changing the contour of the plate, or in metaphyseal regions close to joint surfaces.

Please refer to the Small Fragment LCP Technique Guide for screw placement verification technique.

Optional Procedures

Inserting bone graft

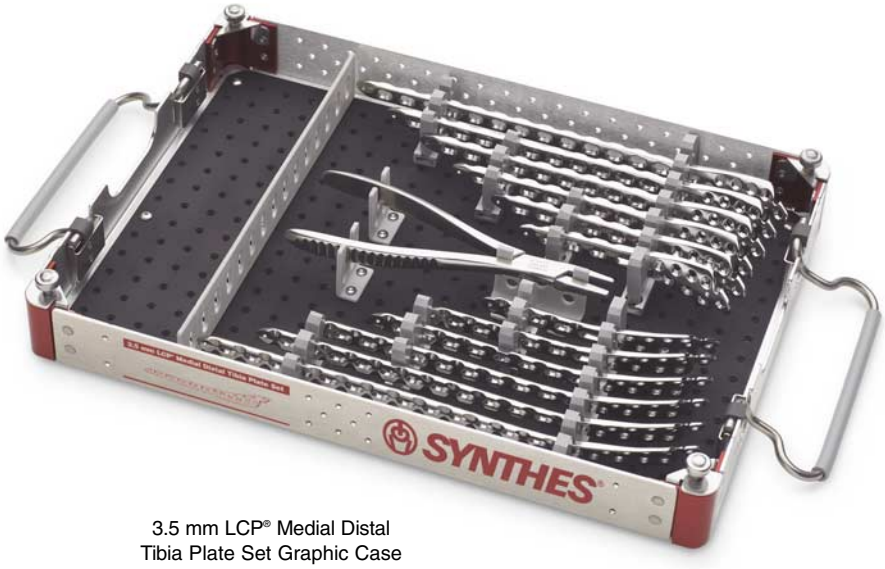
If desired, fill any metaphyseal bone defect with autogenous bone graft or bone graft substitute. When using bone graft substitute, follow the manufacturer's directions for use.

Implant removal

To remove locking screws, unlock all screws from the plate, then remove the screws completely from the bone. This prevents simultaneous rotation of the plate when unlocking the last locking screw.

Apply bone graft if necessary.

3.5 mm LCP® Medial Distal Tibia Plate Instrument and Implant Set [115.358]



3.5 mm LCP® Medial Distal
Tibia Plate Set Graphic Case
690.376

Implants

3.5 mm LCP® Medial Distal Tibia Plates

Right	Left	Holes	Length
239.900	239.901	4 holes	116 mm
239.904	239.905	6 holes	142 mm
239.908	239.909	8 holes	168 mm
239.912	239.913	10 holes	194 mm
239.916	239.917	12 holes	220 mm
239.920	239.921	14 holes	246 mm

Instrument

391.963 Universal Bending Pliers

Required Set

105.434 Locking Small Fragment Instrument and Implant Set—LCP®

239.913
(left)

239.912
(right)

Sterilization Parameters for Set [115.358]

For more information, please see graphic case package insert.

Method	Cycle	Temperature	Exposure Time
Steam	Gravity Displacement (Wrapped)	132°–135°C (270°–275°F)	22 Minutes
Steam	Prevacuum (Wrapped)	132°–135°C (270°–275°F)	8 Minutes

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