

DISTAL FEMUR LOCKED PLATE

Surgical Technique



Sharma Pharmaceutical Pvt. Ltd.

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SURGICAL TECHNIQUE

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Developed in conjunction with

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Introduction

The SPCPL Periarticular Locked Plate System combines Locked Screw technology with periarticular plates to create fixed-angle constructs for use in comminuted fractures or where deficient bone stock or poor bone quality is encountered. The fixed-angle plate/Screw device can be used in osteopenic bone and other areas where traditional Screw fixation may be compromised. The Periarticular Locked Plates will accommodate standard Screws, as well as Locked Screws with threaded heads. When necessary, interfragmentary compression can be achieved with lag Screws. Cannulated Screws and instruments allow provisional fixation with guide pins in the metaphysis. This helps ensure that the threaded Locked Screw heads align properly with the threaded plate holes. All plate configurations contain locking Screw holes in the plate head, and alternating Locked and compression Screw slots in the shaft. Three types of Locked Screws are available with the system: 6.5mm Cancellous Locked Screws for use in the plate head 5.0mm Cancellous conical Screws for use in the plate head 5.0mm cortex Locked Screws for use in the plate shaft 4.5mm Cortical Screws for use in the plate shaft

Locked Screw Technology

The heads of the Locked Screws contain male threads while the holes in the plates contain female threads. This allows the Screw head to be threaded into the plate hole, Locked the Screw into the plate. This technical innovation provides the ability to create a fixed-angle construct while using familiar plating techniques.

Locked Plate Technology

By using Locked Screws in a bone plate, a fixed-angle construct is created. In osteopenic bone or fractures with multiple fragments, secure bone purchase with conventional Screws may be compromised. Locked Screws do not rely on bone/plate compression to resist patient load, but function similarly to multiple small angled blade plates. In osteopenic bone or comminuted fractures, the ability to lock Screws into a fixed-angle construct is imperative. By combining Locked Screw holes with compression Screw slots in the shaft, the plate can be used as both a Locked device and a fracture compression device. If compression is desired, it must be achieved first by inserting the standard Screws in the compression Screw slots before inserting any Locked Screws.

Indications

The Periarticular Locked Plate System is indicated for temporary internal fixation and stabilization of Osteotomies and fractures, including: Comminuted fractures Supracondylar fractures Intra-articular and extra-articular Condylar Fractures in Osteopenic bone Nonunions Malunions.

Fracture Classification

The SPCPL classification for long bone fractures is divided into three general groups, each with three subgroups. The groups are extra-articular, partial articular, and complex articular. The subgroups reflect the degree of metaphysical comminution. Refer to **SPCPL Comprehensive Classification of Long Bones** for more specific information.

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Plate Features

Anatomically contoured plates are precontoured to create a fit that requires little or no additional bending and helps with metaphyseal/diaphyseal reduction. Threaded holes create a 95 degree fixed angle between the plate head and the Locked Screws to allow Screw placement that is parallel to the joint line. The central Locked Screw hole in plate head provides initial reduction of the plate to the Condylar.

The low profile plate facilitates fixation without impinging on soft Tissue. Plates are available in a variety of sizes and lengths, from 6 to 18 holes, left and right. Dual-compression slots will accommodate periarticular Screws or conventional stainless steel Screws and allow bi-directional Compression. The last diaphysis plate hole is designed to accommodate the tension device.

The Locked plate design does not require compression between the plate and bone to accommodate loading. Therefore, purchase of the Screws in the bone can be achieved with a thread profile that is shallower than that of traditional Screws. The shallow thread profile, in turn, allows for Screws with a large core diameter to accommodate loading with improved bending and shear strength (Fig. 1).

The plate shaft design allows for a minimally invasive technique with sub muscular passage of the plate.



Insert 2.0mm K-wire

Insert 4.5mm Cortical Screw

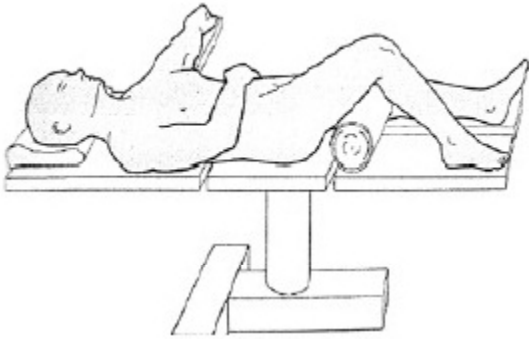
Insert 5.0mm cortex Locked Screw
Multiple Locked holes in the plate head allow placement of the Screws to capture Fragments

Insert 6.5mm and 5.0mm Cancellous Locked Screw

Thick-to-thin plate profiles make the plates Autocontourable. The anatomical shape of the head of the plate matches the shape of the distal femur

SPCPL Distal Femoral Locked Plate features.

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Patient in the supine position on a radiolucent table.

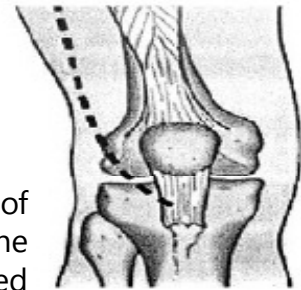
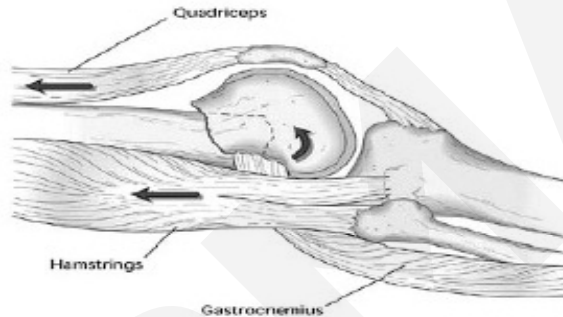
Preoperative Preparation

After assessing the fracture radiographically and preparing a preoperative plan, place the patient in the supine position on a radiolucent table. Be sure that the fluoroscope can be positioned to visualize the distal femur in both the lateral and anterior/posterior (A/P) views.

Fracture Reduction

It is imperative that accurate reduction of the fracture be obtained prior to and maintained during application of the distal lateral femoral Locked plate.

An external fixator or distractor can serve as preliminary fixation. This will make operative reduction easier, and the device can be used as a tool intraoperatively. Before Locked Screws are placed in any fragment, length, rotation, varus-valgus and recurvatum correction should be achieved. The Plate Reduction Instrument is designed to aid in minor varus-valgus and translation corrections prior to Screw placement.



After radiographic verification of preliminary reduction of the fracture, use the preferred approach and technique to expose the distal lateral femur. Reduce the intra-articular fragments using linear bone clamps or Kirschner wires to temporarily hold the reduction. For a Hoffa fracture, reduce the posterior articular fragment and stabilize it with K-wires inserted from anterior to Use lag Screws to secure the intra-articular fragments. To help avoid inserting the lag Screws where they will interfere with the plate placement, hold the plate on the bone in its approximate position. Then insert the lag Screws as needed.

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Plate Insertion

Hold the 6.5mm and 5.0mm Drill Sleeve on the selected hole of the plate in the Distal Holes.

Note:- DO NOT tighten wrong sleeves.



Initial Fixations with K-Wire



Central Distal Hole use 6.5mm Drill Sleeve and
Other Distal Hole use 5.0mm Drill Sleeve

Use this construct to place the initial 2.0mm K-wire/Guide Wire in the metaphysis. Check plate placement – visually and fluoroscopically to ensure that the plate is positioned correctly on the metaphysis of the bone. If placement is appropriate, hold the plate on the shaft part by K-wire and/or insert the 4.5mm Cortical Screw to compression the fracture. Also Use the fluoroscope to confirm the K-wire position in both the A/P and lateral planes. Adjust the K-wire location if necessary.

NOTE: The position of the plate on the bone must be verified because of the tendency to place the proximal end of the plate too far anterior on the femoral shaft. This placement can cause the 4.5mm Cortical Screws to be placed at a tangent and can result in insufficient holding strength.

Because the femoral shaft may not be aligned with the distal fragment, the plate head should be used to determine the appropriate placement of the plate. The plate head should conform to the shape of the intact or reconstructed condyle. This will determine the alignment of the shaft.



Initial Fixations with K-Wire & Drill Bit



Initial Fixations with 4.5mm Cortical Screw

NOTE: It is easier to thread the cannal as into the plate before placing the plate on the bone. Once the plate is properly positioned, insert The Three(3) 6.5mm Cancellous Locked Screws, use 6.5mm Drill Sleeve into the most CENTRAL DISTAL Locked hole in the plate head . Use 6.5mm Drill Sleeve for right direction of the hole. Use 4.0mm dill bit to drilling the hole in the bone.

WARNING:

Do not contour or bend the plate at or near a threaded hole, as doing so may deform the threaded hole and cause incompatibility with the

Locked Screw Always use drill sleeve for Drilling Locked Screws.



Pre- Drill



Tap The Hole



Depth Gauge



Insert the Screw with Screwdriver

Condylar Fixation

= For additional Condylar fixation, slide the 5.0mm Cancellous Locked Screw, use 5.0mm drill Sleeve over the DISTAL Locked hole in the plate head until it contacts the top of the canella. Use 4.0mm drill Bit for drilling the hole in the one.

= Use 5.0mm Bone Tap for Tapping the both the 6.5mm and 5.0mm Cancellous Locked Screw Hole.

= Use Depth Gauge read the proper Screw length from the depth gauge.

= Remove the 2.0mm Guide Wire/K-wire and use the 4.5mm Hex-head Screwdriver to insert the appropriate length 6.5mm and 5.0mm Cancellous Locked Screw into the bone. **Follow the same procedure for** each additional 5.0mm Cancellous Locked Screw to be inserted into the metaphysical portion of the plate. Be sure that all Screws are securely tightened.

NOTE: If the plate shifts during Screw insertion, all the pins and Screws must be removed and reinserted for the Screws to lock properly to the plate.



Depth Gauge



Final Fixation of Distal Screws



Insert the Screw with Screwdriver

Shaft Fixation

Reduce the plate to the shaft. Confirm rotation of the extremity by clinical examination. Check the alignment of the shaft with A/P and lateral fluoroscopic views. The shaft portion of the plate can be compressed to the bone by either inserting a non-Locked Screw through the most proximal shaft compression slot or by using the Plate Reduction Instrument to hold the plate against the bone while inserting a Locked Screw.

= Insert standard 4.5mm Cortical Screws through image intensifier /C-arm the compression slots in the plate as desired. If both Locked and non Locked Screws will be used in the shaft, the non-Locked Screws must be inserted first.

= To insert 5.0mm Cortex Locked Screws. Use 5.0mm Drill Sleeve for drilling the Locked hole. Use the 4.0mm Drill Bit to confirm the drill position in both the A/P and lateral planes.

Predrilling both cortices with the drill bit. Measure for Screw length using the depth gauge. Then select and insert the appropriate length 4.5mm Cortical Screws using the Large Hex Screwdriver.



Pre- Drill



Tap The Hole



Depth Gauge



Insert the Screw with Screwdriver

= if the bone is dense, the lateral cortex can be tapped. If desired, use the 5.0mm Bone Tap to tap for the 5.0mm Cortex Locked Screw.

= Insert the 5.0mm Cortex Locked Screw Depth.

= Gauge into the Screw hole until the tip of the gauge bottoms out in the hole. Read the proper Screw length from the gauge at the point where the gauge meets the surface of the plate.

= Use the 4.5mm Hex-head Driver to insert the 5.0mm Cortex Locked Screw .

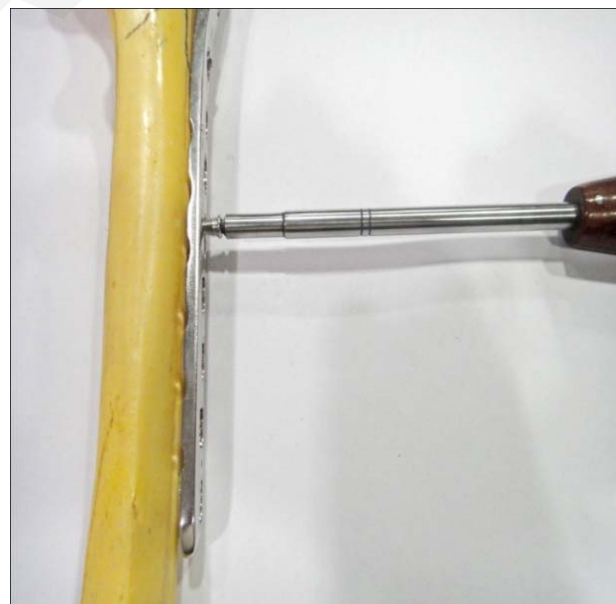
= Follow the same procedure for each additional 5.0mm Cortex Locked Screw. Be sure that all Screws are securely tightened. Make a final check of the limb alignment and fracture reduction. Then make sure that all shaft Locked Screws are securely tightened. Securely tighten the distal Locked Screws again by hand before closing.



Pre- Drill



Tap The Hole



Insert the Screw with Screwdriver

Implant Removal

To remove Locked Screws, use the Large Hexagonal Screwdriver, 5.0mm Hex to first unlock all Screws from the plate and then remove the Screws completely. DO NOT use the forward captive Screwdrivers for Screw removal. Please refer to the package insert for product information, including contraindications, warnings, and precautionary information.



Final Fixation

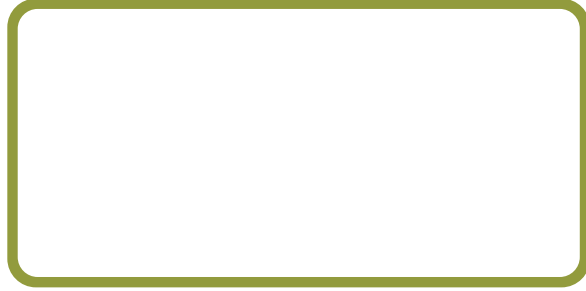
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