Versa-Fx®/ Versa-Fx II/ Free-Lock® Femoral Fixation System

Surgical Techniques

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Surgical Technique For Fixation Of Proximal Femur and Supracondylar Fractures of the Femur

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Indications for Use

***Free-Lock* Femoral Fixation System**

The *Free-Lock*® Femoral Fixation System may be used for internal fixation of hip fractures with application to intracapsular and intertrochanteric fractures, osteotomies, arthrodeses and subtrochanteric fractures with extension into the greater trochanter and the piriformis fossa (Winquist Type III comminuted fracture).

***Versa-Fx* Femoral Fixation System**

The *Versa-Fx*® Femoral Fixation System may be used for the internal fixation of supracondylar fractures with displaced intra-articular fragments, with vertical intra-articular extension, and in the patient with multiple lower extremity fractures.

***Versa-Fx* II Femoral Fixation System**

Supracondylar: The *Versa-Fx* II Femoral Fixation System may be used for the internal fixation of supracondylar fractures with displaced intra-articular fragments, with vertical intra-articular extension, and in the patient with multiple lower extremity fractures.

Proximal Femur: The *Versa-Fx* II Femoral Fixation System may be used for internal fixation of Hip fractures with application to intracapsular and intertrochanteric fractures, osteotomies, arthrodeses, and subtrochanteric fractures with extension into the greater trochanter and the piriformis fossa (Winquist Type III comminuted fracture).

Surgical Technique for Proximal Femur Fractures

Introduction

Choosing the Angle of Fixation

The development of tube/plates has provided the surgeon with a wider range of options. For a simple intertrochanteric fracture, which is stable and not displaced, the lower angle (135 degree) device is appropriate, as only minimal impaction and collapse of fracture fragments typically occur.

Higher-angle fixation, while more technically demanding, is helpful for treating comminuted fractures where fracture fragments need to impact postoperatively in order to gain stability. Increasing the neck/shaft angle with high-angle fixation decreases mechanical stress on the implant and increases the tendency for sliding, thereby facilitating the impaction of fracture fragments.

In choosing the angle of fixation keep in mind that it is desirable to achieve 70 to 80 percent of fracture impaction at the time of surgery. Another consideration, apart from the nature of the fracture itself, is the substantial anatomic variation encountered in the natural neck/shaft angle of the femur. This angle can vary from 135 degrees to as much as 160 degrees.

The *Versa-Fx* II or *Free-Lock* Femoral Fixation Systems provide optimum flexibility in angle of fixation with tube/plates of 130, 135, 140, 145, and 150 degrees.

Recommended Patient Positioning and Radiographic Control

After anesthesia is administered, place the patient in the supine position on the fracture table (Fig. 1). The sacrum and perineal post should be well padded. Pull the patient down onto the padded post and position both lower limbs in 30 to 40 degrees of abduction.

Strap or tape the feet directly to the footplates of the traction device. Using manual traction, bring the injured limb to about 10 degrees of abduction and the uninjured limb to maximum abduction. Using mechanical traction, internally rotate both legs so that the feet rest in approximately 45 degrees internal rotation with the knees in slight internal rotation. Apply further traction to the limb to tighten the hip capsule. This will cause the externally rotated neck and shaft to be distracted distally and brought into internal rotation.

Two x-ray machines may be used, the lateral tube passing parallel along the 45-degree angle of the uninjured leg through the opposite acetabulum and ilium. The A/P tube should be overhead. When available, image intensification may be used in a similar manner, positioning the machine between the patient's legs

The aforementioned description is the recommended standard positioning setup; however, other methods, including free on a radiolucent table, flexion of the opposite hip, or scissoring of the leg, may be utilized at the surgeon's discretion.

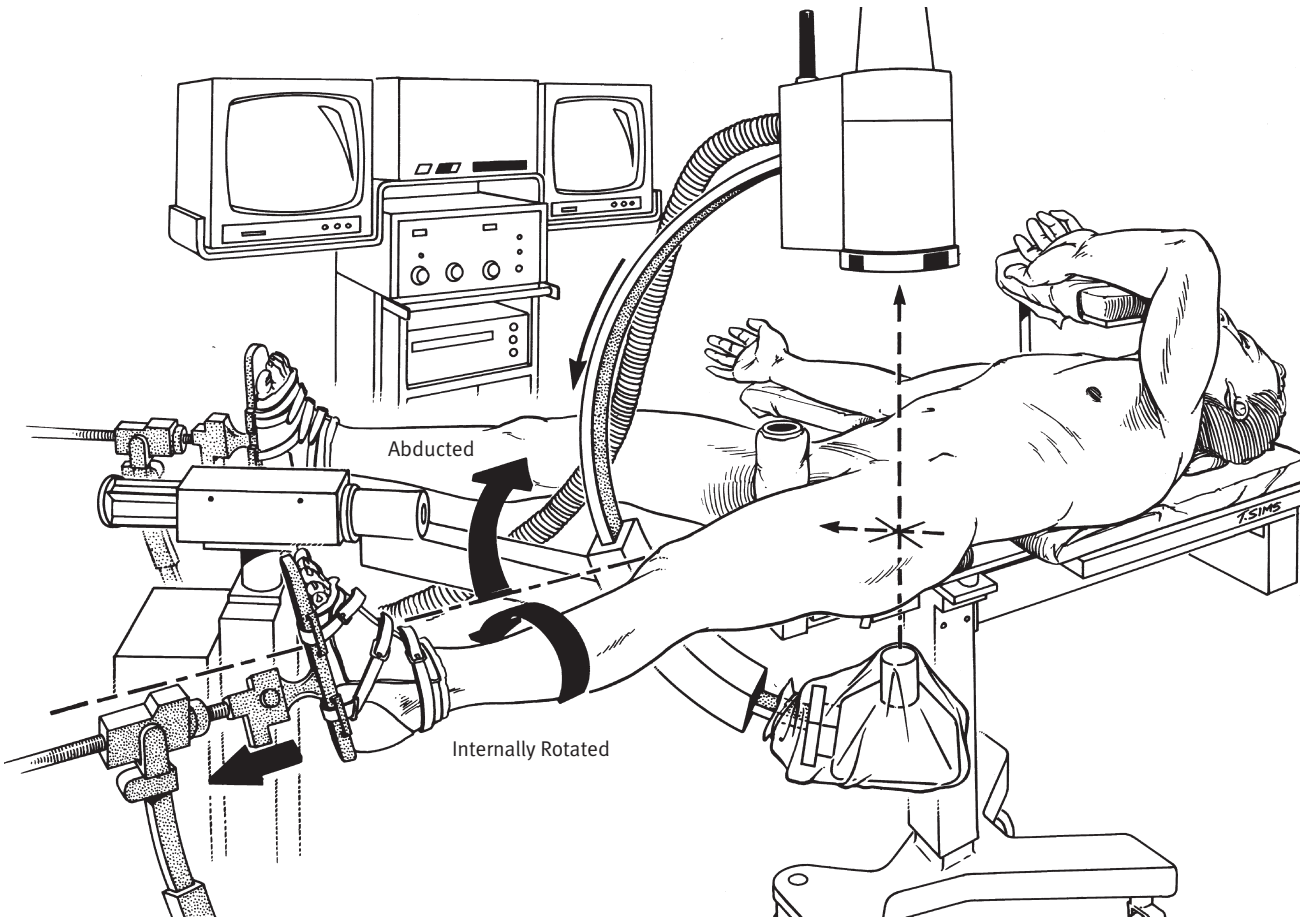


Fig 1. Patient Positioning

Reduction, Incision, and Exposure

The incision should not be made until the best reduction possible is accomplished. Obtain A/P and lateral roentgenograms and make sure the entire femoral head and acetabulum are visible in the lateral film. Further manipulation of the fracture may be necessary to obtain the best possible reduction. An anatomic reduction or a slightly over corrected (valgus) reduction should be seen in the A/P film. Occasionally, a slight sag of the fracture may be seen on the lateral view.

Prepare the operative site in the usual manner. Begin the incision at the tip of the greater trochanter and extend it distally for about 15cm in a longitudinal direction (Fig. 2). Continue the incision down through the subcutaneous tissues and split the fascia lata to expose the underlying vastus lateralis.

Retract the muscle anteriorly and follow it posteriorly along the fascia toward the linea aspera. Incise the muscle just anterior to its insertion on the linea aspera, then elevate it subperiosteally from the femoral shaft. (In extremely obese patients, the insertion on the intertrochanteric line may be tenotomized as well.) Palpate the lesser trochanter on the interior posterior aspect of the proximal femur and use it as a reference point for the insertion of the guide pin.

Guide Pin Placement

The placement of the guide pin is the most critical step of the surgical procedure as the guide pin serves to establish the angle of fixation. Subsequent reaming, tapping, and implant placement are performed with cannulated instrumentation, which follows the path established by the guide pin.

Establish a preliminary drill track with an entry point on the lateral femoral cortex. Guide pin angles will vary by patient. This is only an initial step to provide a general starting point and varies with each patient based on anatomy. If using a 135-degree tube/plate, establish the entry point at an area directly opposite the lesser trochanter and aim it proximally and medially at 135 degrees. Place a guide pin through this point directly on to the center of the femoral neck and head (Fig. 3). This positioning serves as a trial prior to inserting the guide pin into the bone. If using a 150-degree tube/plate, establish the drill track 2cm below this point. A guide pin inserted at this point and

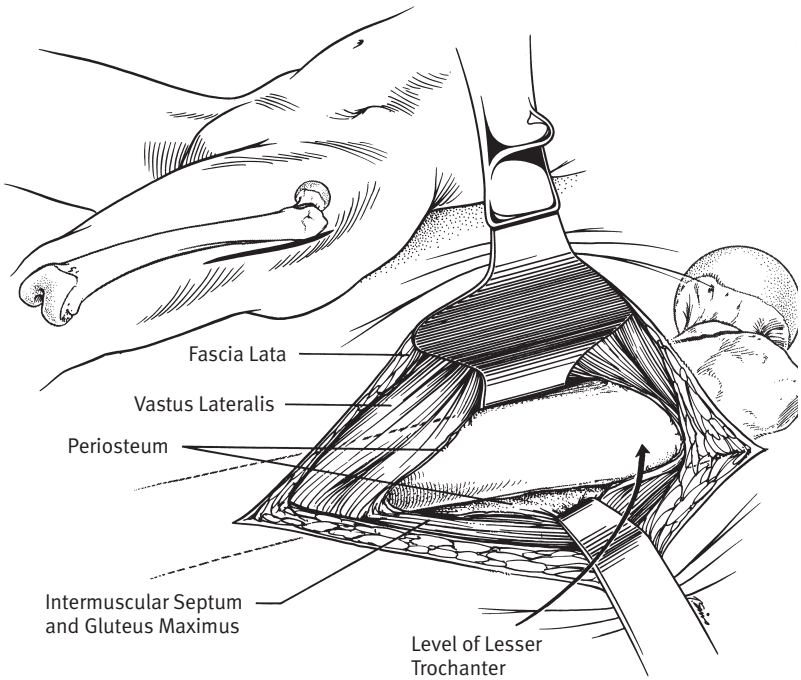


Fig 2. Exposure

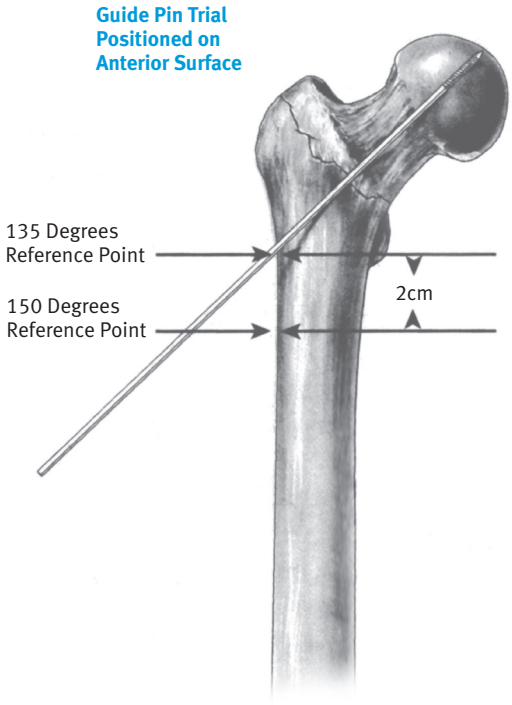


Fig 3. Guide Pin Placement

aimed proximally and medially at 150 degrees will pass along the calcar femorale into the femoral head. A guide pin passed along the anterior aspect of the femoral neck may be visualized on image intensification and serve as a further guide to pin placement along the lateral cortex as well as assisting in the determination of the angle of anteversion or retroversion of the femoral neck. A Parallel Guide can be inserted superiorly to assist with stability of the proximal intertrochanteric fracture while inserting the lag screw into position.

Use a countersink or drill bit to make a pilot hole approximately 6.4mm in diameter through the appropriate reference point. Then use one of five angle settings on the **Adjustable Double Pin Guide** (130, 135, 140, 145, or 150 degrees) to insert the guide pin into the bone at the desired angle (Fig. 4). Use anteroposterior and lateral roentgenograms or image intensification to verify correct placement of the guide pin. If using image intensification, verify pin position during insertion. The guide pin should be inserted until well purchased in the subchondral bone of the femoral head, extending to within 3mm to 6mm of the joint space. Do not drill the guide pin into the joint space or acetabular cortex as this may damage the joint.

Determining Guide Pin Depth

Use the Guide Pin **Depth Gauge 9 in.** to obtain a direct reading of the guide pin "pilot length" (Fig. 5). Select the length of tap and ream depth from this measurement.

If the guide pin perforated the femoral head cortex, the amount of the overshoot of the guide pin must be considered in determining ream and tap depth.

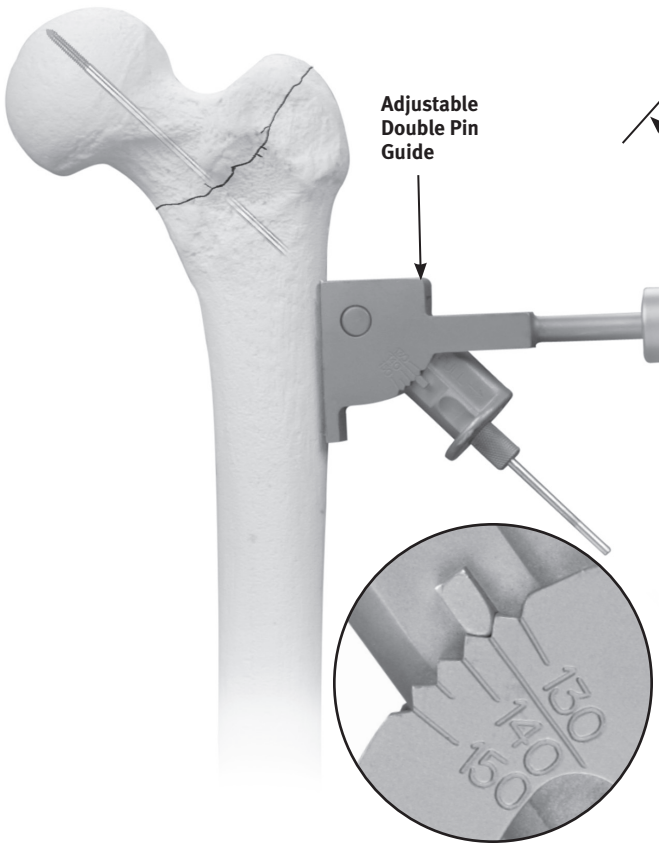


Fig 4. Drill Guide With Pin

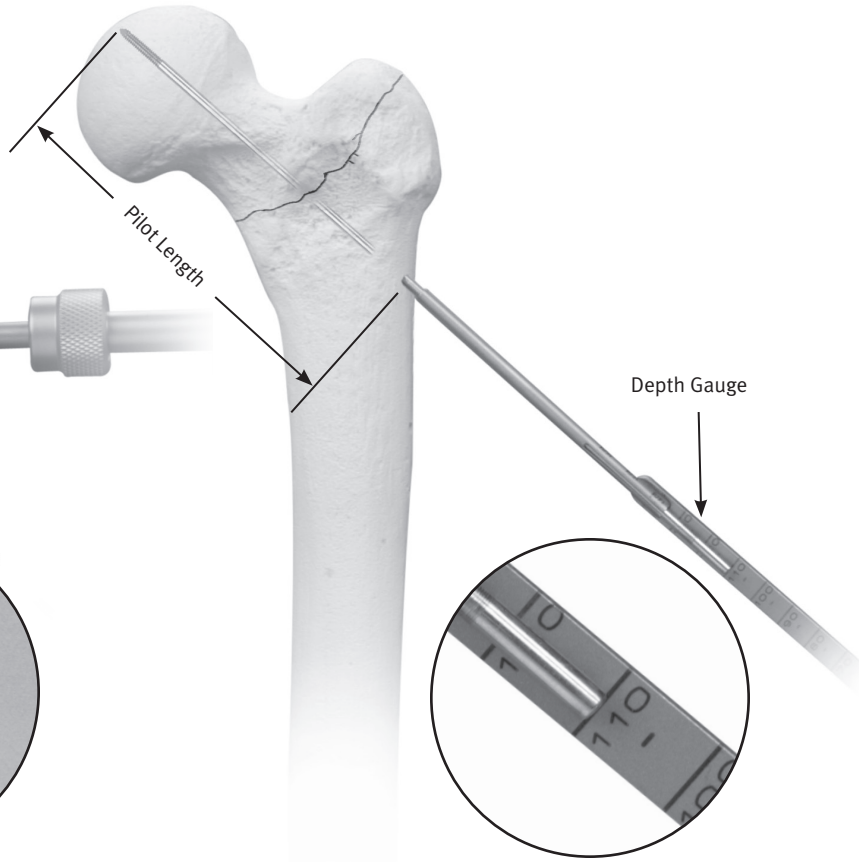


Fig 5. Pilot Length Measurement

Reaming the Lag Screw Channel

To prepare the lag screw channel, assemble the **Combination Reamer Shaft** with either the **short or standard reamer head** (Fig. 6). If using Freelock System, use **Standard Tube Reamer Head, 15mm Diameter** (00-1180-034-00).

The reamer shaft is calibrated for direct measurement of the distance from the tip of the reamer shaft to the countersink portion of the reamer head. Set the reamer with the calibrations at the **rear** of the reamer head as shown. Ream to the point where you countersink as shown in figure 6.

If working with good, healthy bone stock, set the reamer to ream to the true pilot length of the lag screw to be used. This will make it easier to tap and drive the lag screw. In elderly osteoporotic patients, ream the channel shorter than the selected length of the lag screw as this may enhance screw purchase in the bone.

If the guide pin is inadvertently removed with the reamer, place the **Pin Relocator** into the reamed channel. Reinsert the guide pin through the cannulation and tap it into place (Fig. 7).

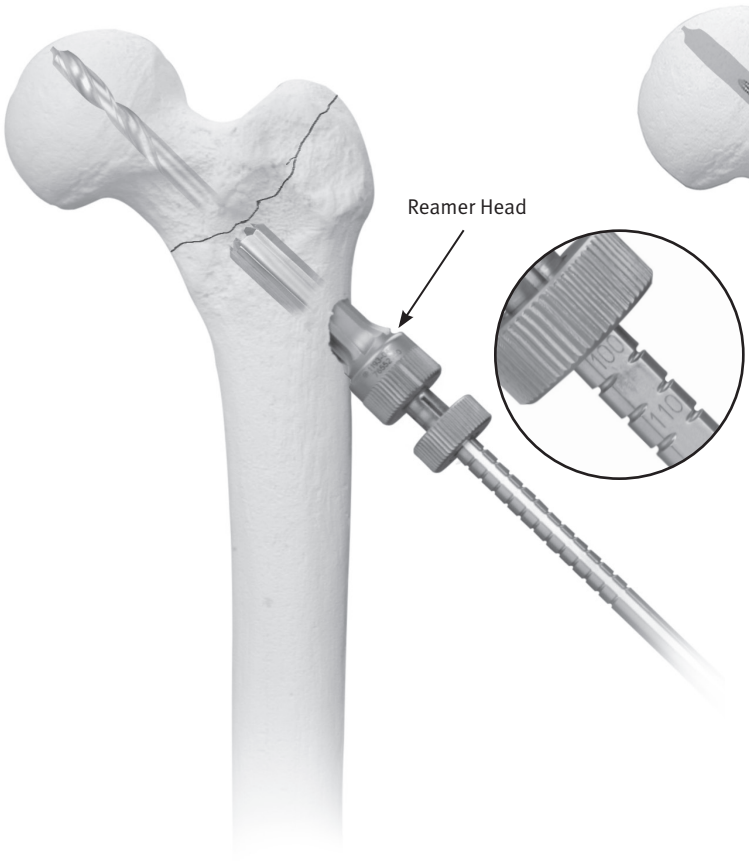


Fig 6. Reaming

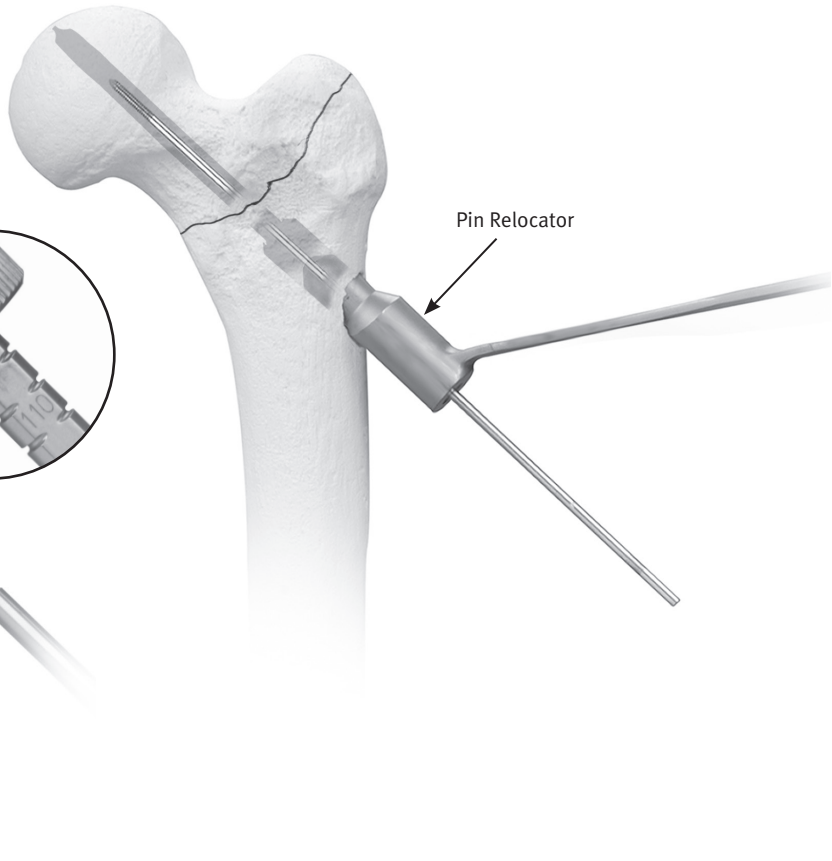


Fig 7. Reinserting Guide Pin

Tapping the Lag Screw Channel (Optional)

After reaming, in dense bone, assemble the **Cannulated Bone Tap** with the subcomponents; bone tap guide and bone tap stop. Pass the assembled Cannulated Bone Tap over the guide pin to pre-tap a channel for the lag screw threads (Fig. 8). Place the Bone Tap Guide into the center of the reamed tube channel to maintain an on-center tap position. The calibrations (Fig. 9) on the bone tap are true measurements of the distance from the tip of the tap to the **rear** of the locking assembly. Tap in a clockwise motion until the locking assembly comes in contact with the Bone Tap Guide.

Determining the Lag Screw Length

For a typical case in which a standard tube/plate is used and the distance reamed and tapped is the same as the pilot length, the lag screw length may be 10mm less than the pilot length for low-angle plates (130, 135, 140 degrees). Higher-angle plates (145, 150 degrees) may use a lag screw equal to 5mm less than the pilot length. Short tube/plates require a lag screw 5mm longer than the pilot length for low-angle plates (130, 135, 140 degrees). High-angle short tube/plates require a lag screw 10mm longer than the pilot length. (Refer to Guidelines in Determining Lag Screw Length.)

Note: Under all circumstances, a minimum of 22mm of overlap must be maintained between the tube/plate and lag screw to ensure that binding between the two components is minimized.

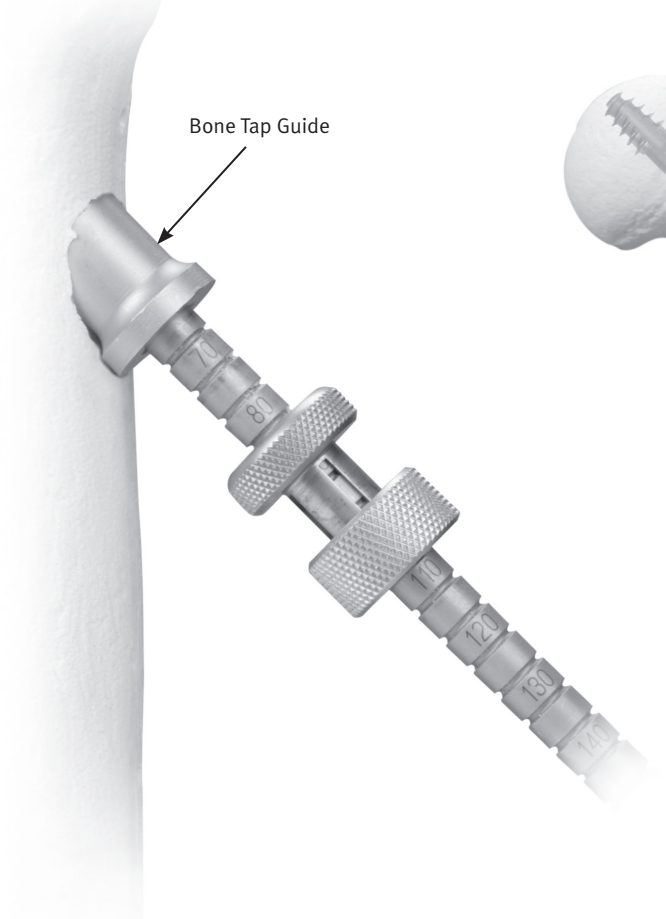


Fig 8. Tapping

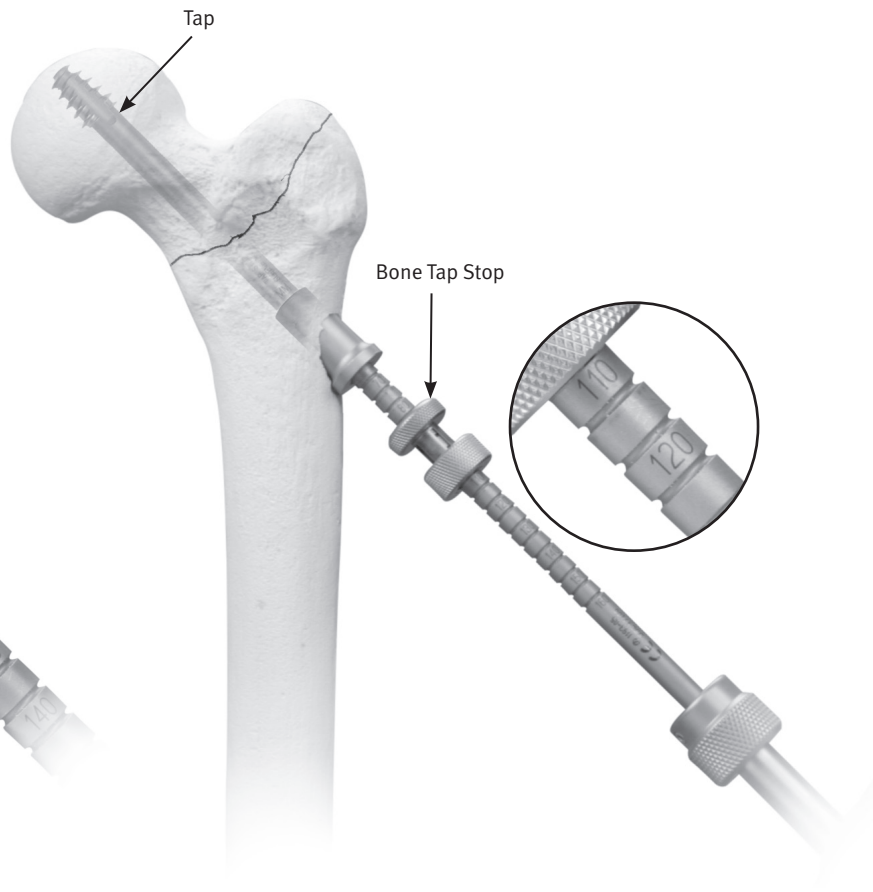


Fig 9. Calibrations On Bone Tap

Guidelines in Determining Lag Screw Length

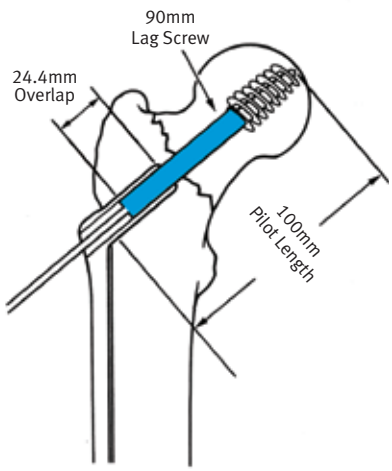
Angle	Standard Tube	Short Tube
130°	1 2	4
135°	1 2	4
140°	1 2	4
145°	1 3	5
150°	1 3	5

1. Typical case, use same lag screw length as pilot length
2. May use lag screw 10mm less than pilot length
3. May use lag screw 5mm less than pilot length
4. Should use lag screw 5mm more than pilot length
5. Should use lag screw 10mm more than pilot length

When pilot length is between the available incremental values, go to the next **highest** reading. This will be the correct pilot length.

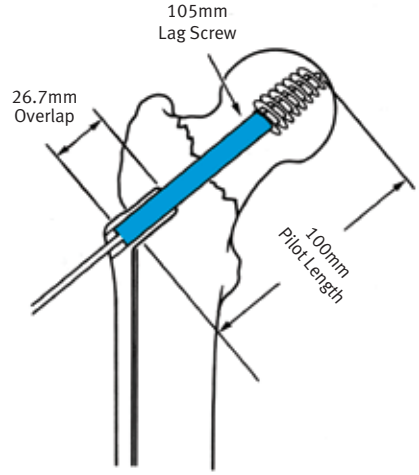
Target minimum overlap of lag screw and tube/plate is 22mm.

Note: Any differences in ream or tap depth, or large degrees of anticipated impaction should be taken into account.



2

130-degree Standard Tube/Plate



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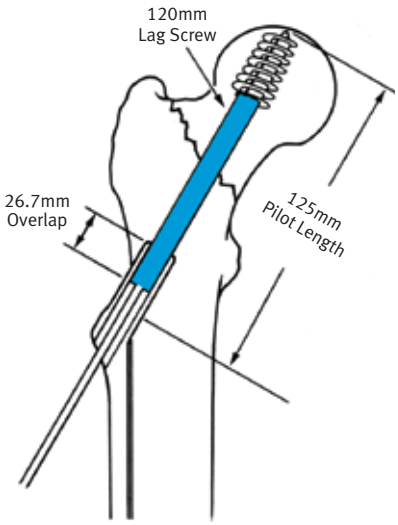
130-degree Short Tube/Plate



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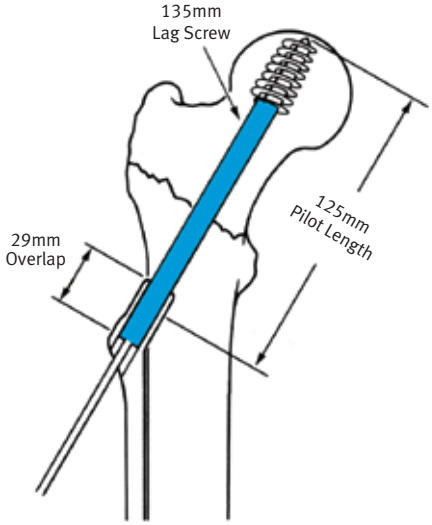
150-degree Standard Tube/Plate



5

150-degree Short Tube/Plate

Insertion of the Implant

Assemble the **T-handle** onto the **Linked Lag Screw Inserter** (Fig. 10a) and place the selected tube/plate onto the recessed diameter of the inserter. Place the appropriate length lag screw into the driving tip of the instrument (Fig. 10b). Then place the entire assembly over the guide pin and into the channel prepared in the lateral cortex (Fig. 10c).

The Lag Screw Inserter engages a slot on the base of the screw. The design of the inserter prevents side-to-side migration within the lag screw slot. Turn the screw first in a counterclockwise direction until a click is felt indicating that the screw threads match the tapped hole. Then turn the inserter clockwise to advance the lag screw to the desired depth. The shaft of the tube/plate should be parallel to the shaft of the femur as the screw is inserted. After insertion of the lag screw, move the tube/plate into position over the lag screw with the barrel resting in the reamed channel. If desired, clamp the tube/plate to the shaft of the femur.

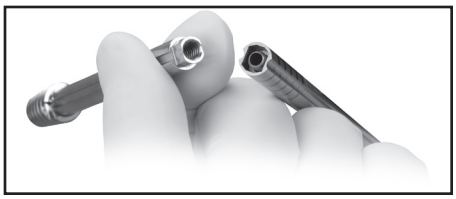


Fig 10a. Lag Screw / Inserter Connection

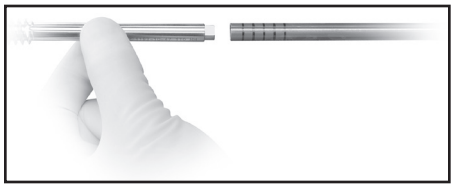


Fig 10b. Lag Screw / Inserter Alignment

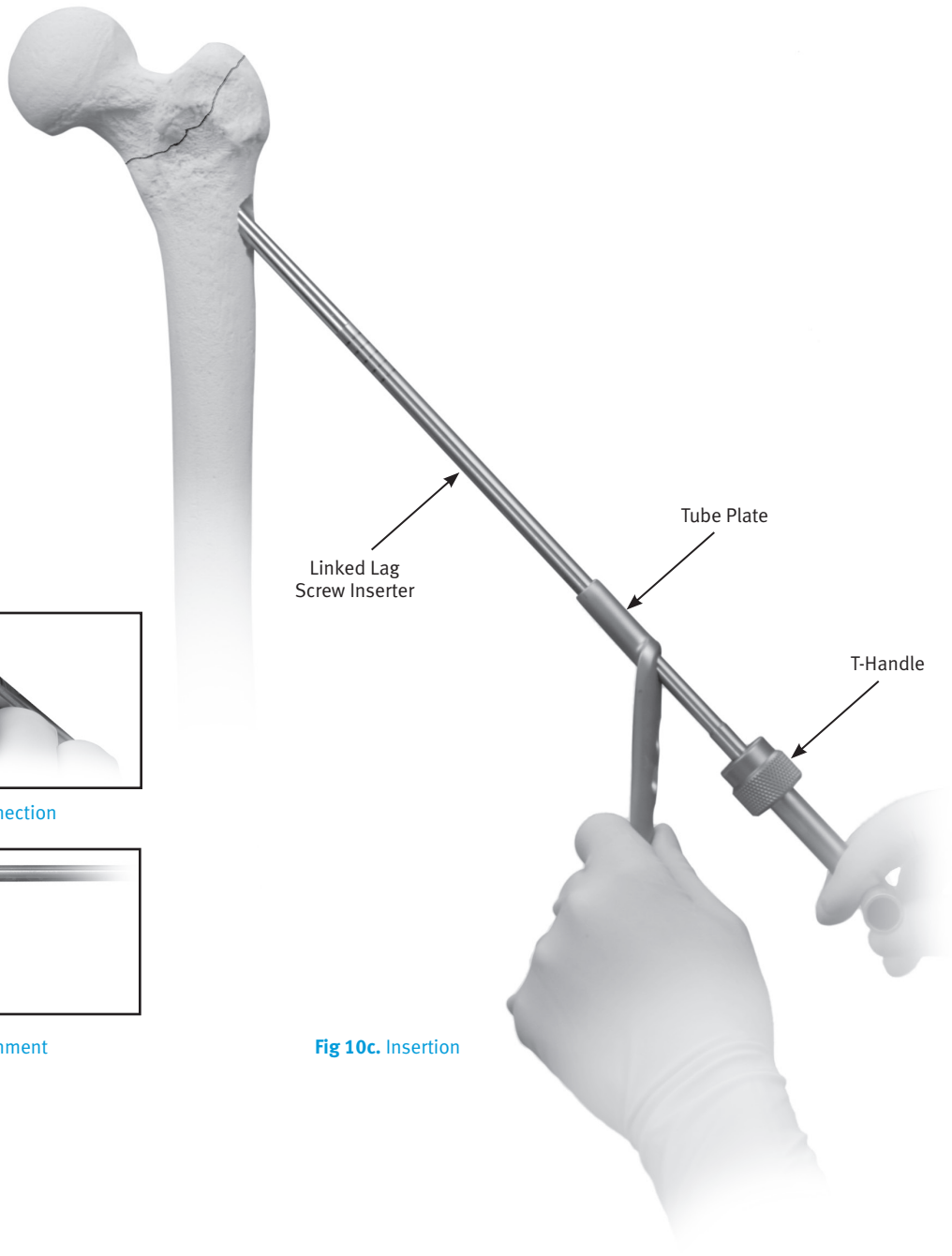


Fig 10c. Insertion

Attaching the Side Plate

Attach the tube/plate to the shaft of the femur using 4.5mm diameter cortical bone screws with bicortical fixation. The proximal hole on the tube/plate has been enlarged to accept either 4.5mm cortical, 6.5mm cancellous, or 7.0mm cannulated screws. The larger 6.5mm and 7.0mm screws are helpful in capturing medial fragments. The **4.5mm Compression Drill Guide** assures proper screw placement with the side plate hole (Fig. 11). The **Depth Gauge, Large** determines the proper bone screw length (Fig. 12). The Bone Tap assures proper interface between the bone screws and the bone.

Please refer to pages 14 and 15 to review the use of the *Magna-Fx* Cannulated Bone Screw in the proximal hole of the tube/plate for better fixation in specific fracture types.

Fig 11. Drilling For Side Plate Fixation

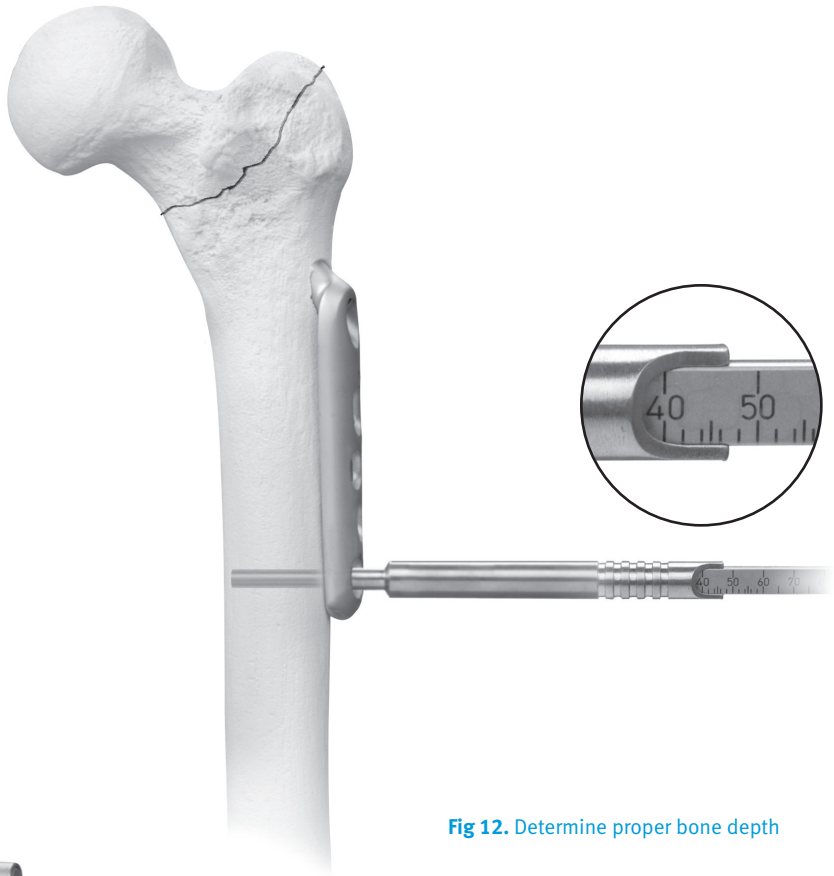


Fig 12. Determine proper bone depth

Impaction (Optional)

Use the **Impactor** to impact the fracture. Use the Impactor to impact the tube and side plate (Fig. 13).

Use of a compression screw is recommended in all cases to ensure adequate overlap of the lag screw in the tube as well as to achieve further impaction (Fig. 14). **However, it is important to avoid excessive force with compression or impaction because the lag screw threads may strip in soft femoral head bone.**

The required compression screw length varies by case and is dependent upon the lag screw length and fracture gap prior to compression. If too long of a compression screw is initially utilized upon insertion, it may bottom out in the lag screw, preventing the fracture from being fully compressed. Compression screws are available in seven lengths ranging from 1/2 inch to 2 inch lengths in quarter inch increments. The recommended starting length is 1 inch and may be adjusted accordingly.

After compression is achieved, the compression screw may be removed.

Final radiographs should be obtained before closing to make certain that the fracture is completely compressed and there is no gap or abnormal angulation at the fracture site (Fig. 15).

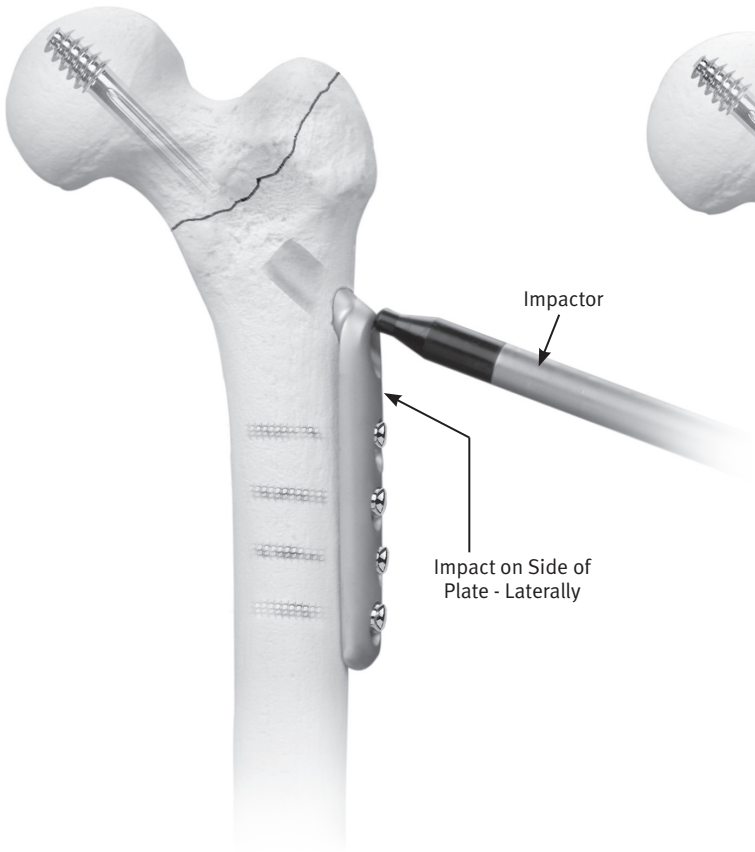


Fig 13. Impaction

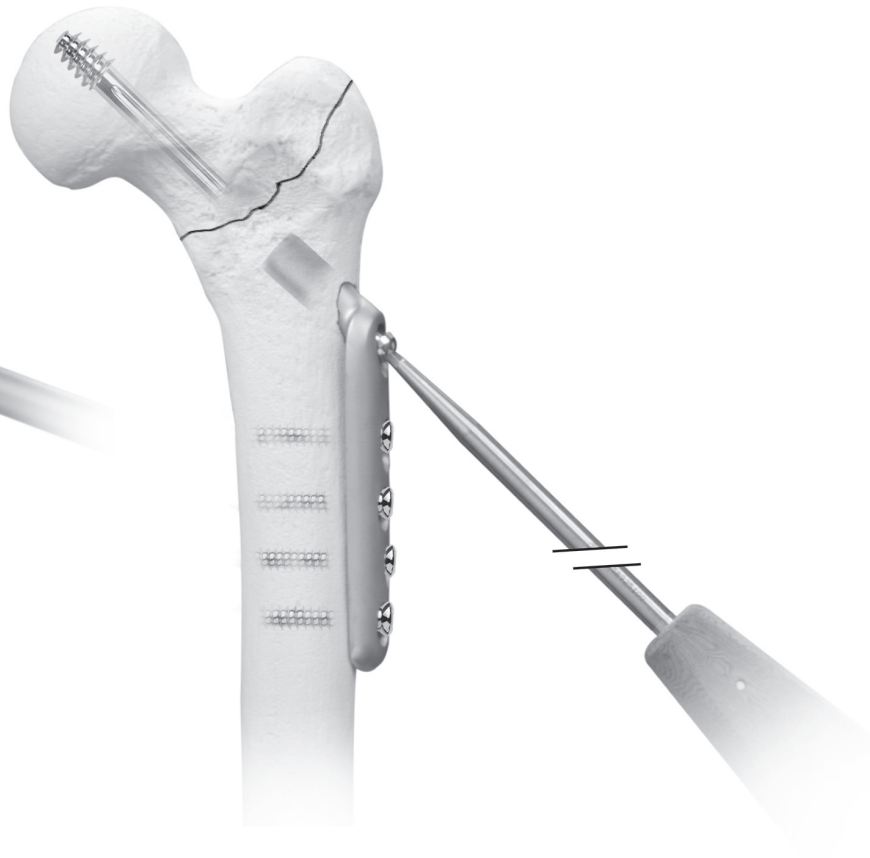


Fig 14. Inserting The Compression Screw

Wound Closure

Close the wound tight using sutures in muscle, fascia, subcutaneous tissue and skin. Dress the wound with a pressure dressing.

Postoperative Care

Dependent on fracture type and surgeon discretion, patients should be encouraged to get out of bed immediately following surgery and should commence weight bearing as tolerated.

Extraction

Extract the cortical screws, cancellous screws, and tube/plate in the usual manner. Use the **Lag Screw Extractor** to extract the lag screw, without using the inserter. Insert the extractor shaft into the lag screw hole where the tube/plate has been previously extracted, fitting into the large hexagonal part of the lag screw shaft. To assemble the Lag Screw Extractor, insert the **Extractor Link** into the lumen of the **Extractor Shaft**, and then screw the **Lag Screw Extractor** into the lag screw. After the lag screw is attached to the Lag Screw Extractor, attach the T-handle, and extract the lag screw by turning counterclockwise.

Fig 15. Final Implant Position

Inserting the Magna-Fx 7.0mm Cannulated Bone Screw

Step 1 — Guide Pin Placement

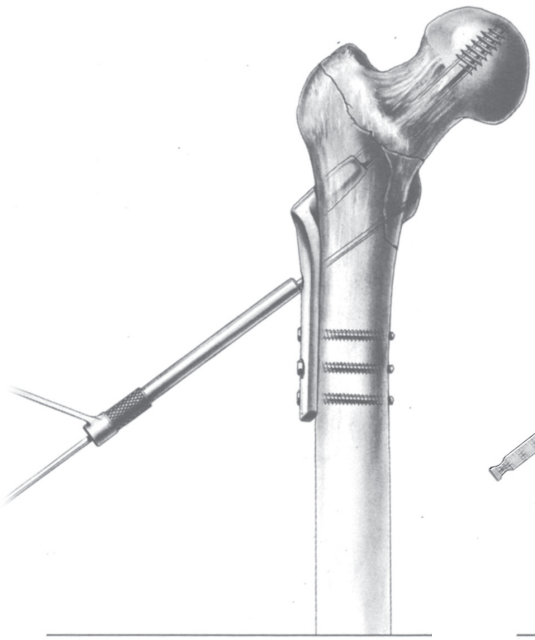
Following fracture reduction under image intensification control, insert a 3.2mm, 9-inch long guide pin across the fracture site, either freehand or using the 3.2mm Pin Guide, engaging the subchondral bone.

Step 2 — Measuring

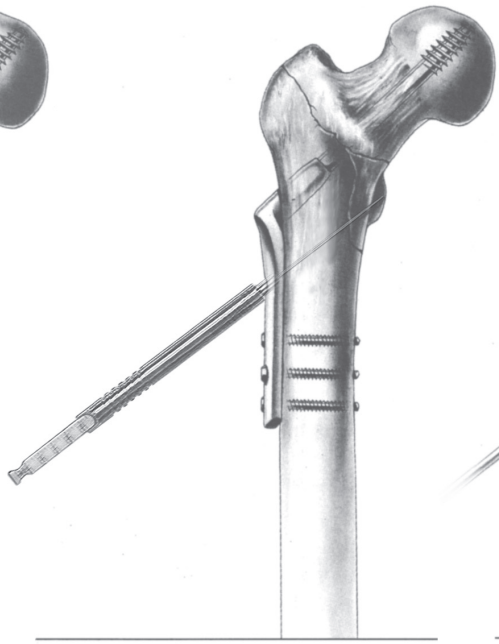
Place the **Depth Gauge, Large** over the guide pin and read the actual depth of the pin in the bone. The surgeon may elect to use a screw 5 to 10mm less than the Depth Gauge reading.

Step 3 — Drilling* (Optional)

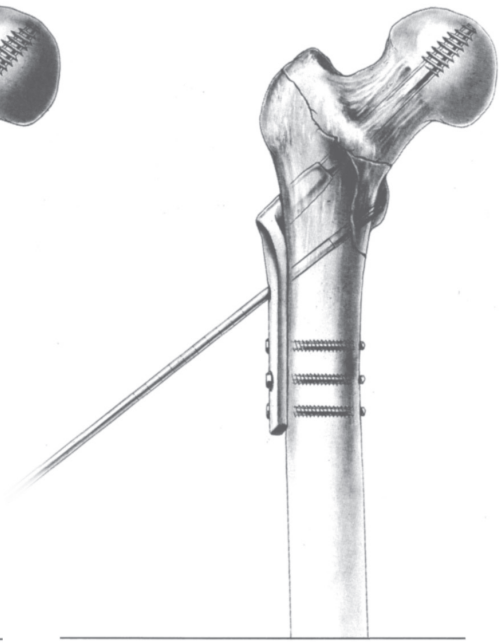
Using the Cannulated Reamer, drill to a depth 10mm less than the actual depth of the pin.



Step 1. Guide Pin Placement



Step 2. Measuring



Step 3. Drilling

Step 4 — Tapping* (Optional)

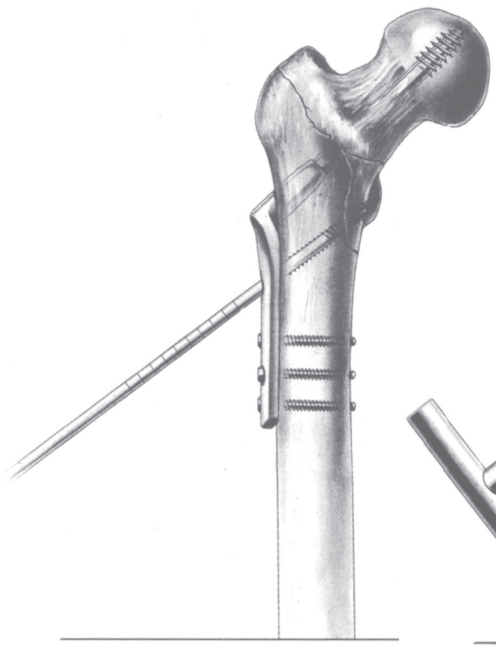
The self-cutting threads of the *Magna-Fx* Screw allow tapping to be optional. Place the Cannulated Tap over the guide pin and tap the proximal cortex. In young patients with hard bone it may be necessary to tap the entire reamed length.

Step 5 — Screw Insertion*

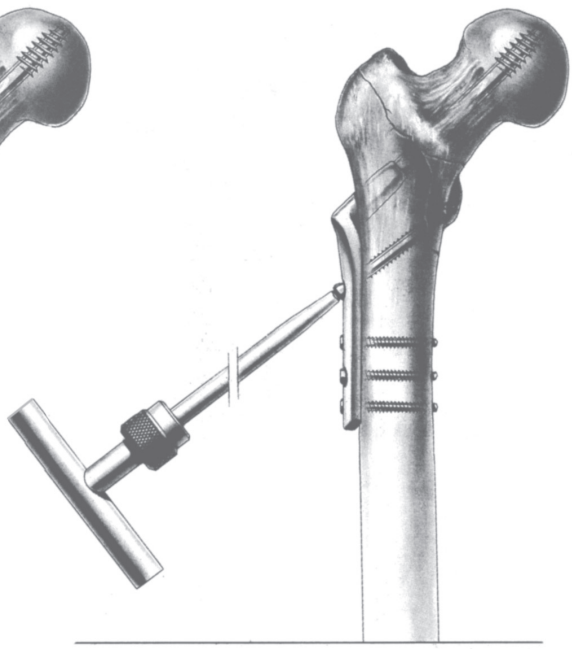
A. Using a power hand piece with the Cannulated Screwdriver Bit, insert the proper length *Magna-Fx* Fixation Screw over the guide pin. When the screw is one inch from the side plate, remove powered hand piece and screwdriver.

B. Using the manual Cannulated Driver and T-handle, finish seating the screw and check fracture impaction with x-ray. Threads must not extend across the primary fracture site. Remove the guide pin.

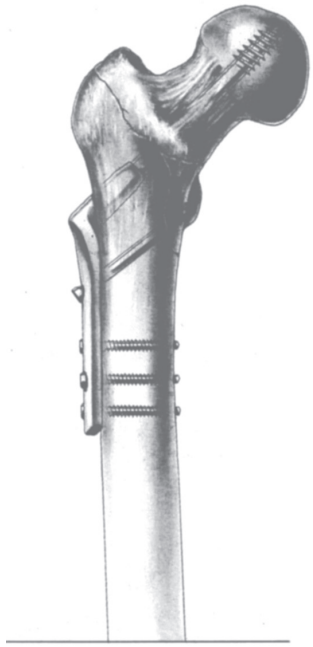
***Warning:** During placement of the guide pins, reaming, tapping and screw insertion, image intensifier control is required. This will assure proper guide pin placement and also assure that the guide pins do not advance during the reaming, tapping or screw insertion procedure.



Step 4. Tapping



Step 5. Screw Insertion



Final Implant Position

Surgical Technique for Fixation of Supracondylar Fractures of the Femur

Introduction

The effective management of supracondylar femur fractures presents a challenging problem to the orthopaedic surgeon. The use of a lag screw and 90- or 95-degree tube/plate provides one acceptable method of rigid internal fixation of such fractures.

The *Versa-Fx/Versa-Fx II* Families provide the surgeon with the flexibility to use either the 90- or 95-degree plate and sliding compression screw for the fixation of supracondylar femur fractures.

Patient Positioning and Radiographic Control

After administering a general or spinal anesthesia, transfer the patient to the operating table in the supine position. If desired, place a sterile bump under the ipsilateral thigh (Fig. 16). Prep and drape the affected leg using a sterile technique. Place the calf and foot in a sterile stockinette. Exclude the contralateral lower extremity from the sterile field with a U-drape. The ipsilateral iliac crest should be included in the operative field, should a bone graft be required.

It will be necessary to use image intensification or other x-ray imaging. The image intensifier should be sterile-draped and may be positioned from either the contralateral or ipsilateral side of the operating table.

Reduction, Incision, and Exposure

Expose the supracondylar fracture through an anterolateral or straight lateral approach (Fig. 17). Make a linear incision proximal to the patella along a line that runs from the anterior-superior iliac spine to the lateral border of the patella. The exact length of the incision is determined by the extent of the fracture. Open the interval between the vastus lateralis and the rectus femoris to expose the vastus intermedius. Longitudinally incise the fibers of the vastus intermedius over the anterior aspect of the femur. Extend the dissection subperiosteally around the bone.

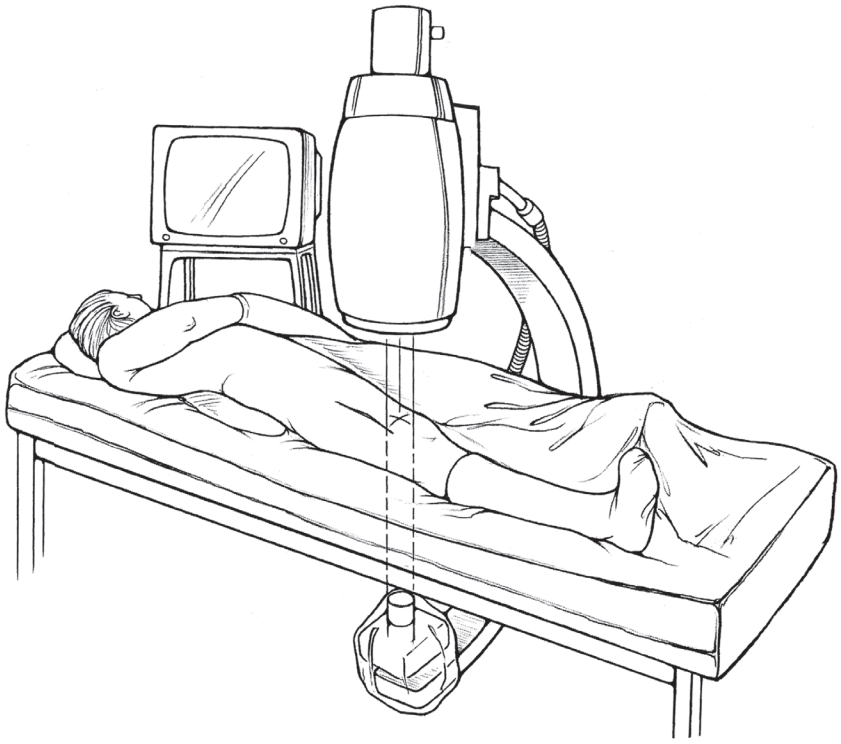


Fig 16. Patient Positioning

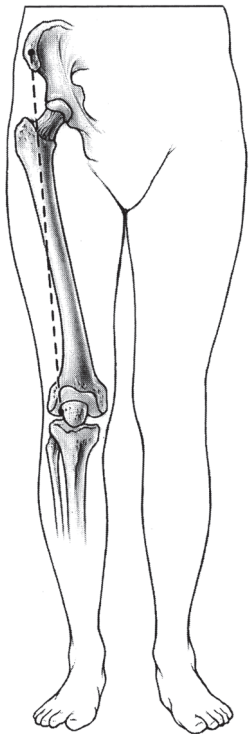


Fig 17. Incision

The exposure may be carried distally by continuing the skin incision distally along the lateral border of the patella, ending 1cm below the joint line of the knee. Incise the lateral patellar retinaculum 1cm from the patella. Incise the synovium to expose intra-articular fractures (Fig. 18a and 18b).

As an alternative method, use a lateral approach that is posterior to the vastus lateralis. However, the anterolateral approach provides a better exposure of intra-articular fractures.

The fracture should be reduced under direct vision. Intra-articular fractures may be temporarily stabilized with cancellous interfragmentary screws or K-wires. Be careful to place these screws or K-wires anterior or posterior to the insertion site of the center of the anterior half of the femoral condyles.

Inspect the supracondylar portion of the fracture for comminution and assess the need for bone grafting. Reduce the fracture under direct vision and stabilize it with bone clamps.

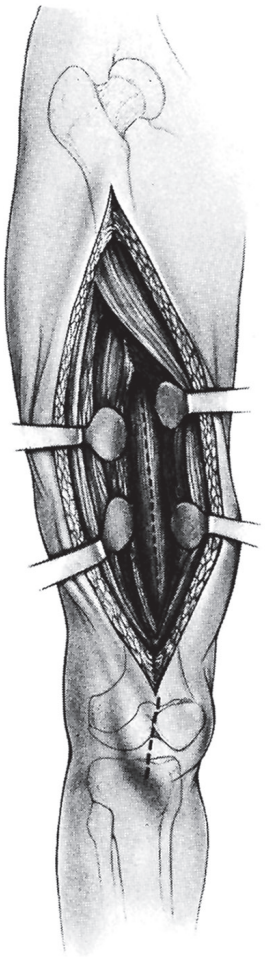


Fig 18a. Exposure

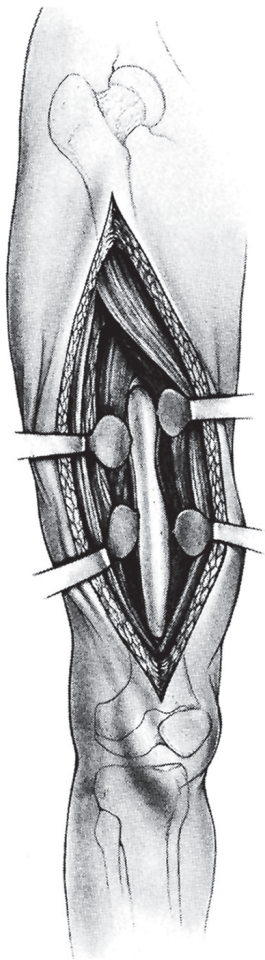


Fig 18b. Exposure

Guide Pin Placement

Place the **90- or 95-degree Guide Pin Template** along the lateral femoral condyle and establish the appropriate angle between the guide pin and the lateral femoral cortex. The guide pin should ideally pass through the center of the anterior half of the condyles without penetrating the intercondylar notch (Fig. 19). The guide pin will pass approximately parallel to the knee joint; however, small angular deviations may be necessary to ensure that the side plate lies flush against the lateral femoral cortex. If desired, temporarily place a guide pin along the anterior aspect of the distal femur running through the center of the femoral condyles and remaining superior to the notch. Use image intensification to confirm the guide pin position.

Mark the starting point for the guide pin on the lateral femoral condyle. Drill the guide pin into the condyles using image intensification for guidance. Advance the guide pin until it abuts the opposite cortex.

The guide pin placement for a 90-degree compression screw is similar to that for a 95-degree compression screw except that the 90-degree template is used to establish the appropriate angle between the guide pin and the lateral femoral cortex. In this case, when positioned flush against the lateral femur, the 90-degree template will direct the guide pin at approximately five degrees superior to the knee joint.

Determining Guide Pin Depth and Reaming and Tapping the Lag Screw Channel

Use the Guide Pin **Depth Gauge 9 in.** to measure the length of the pin within the bone. This measurement, called the "pilot length," is used to determine the length of the lag screw and to set the depth of the Lag Screw Reamer (Fig. 20).

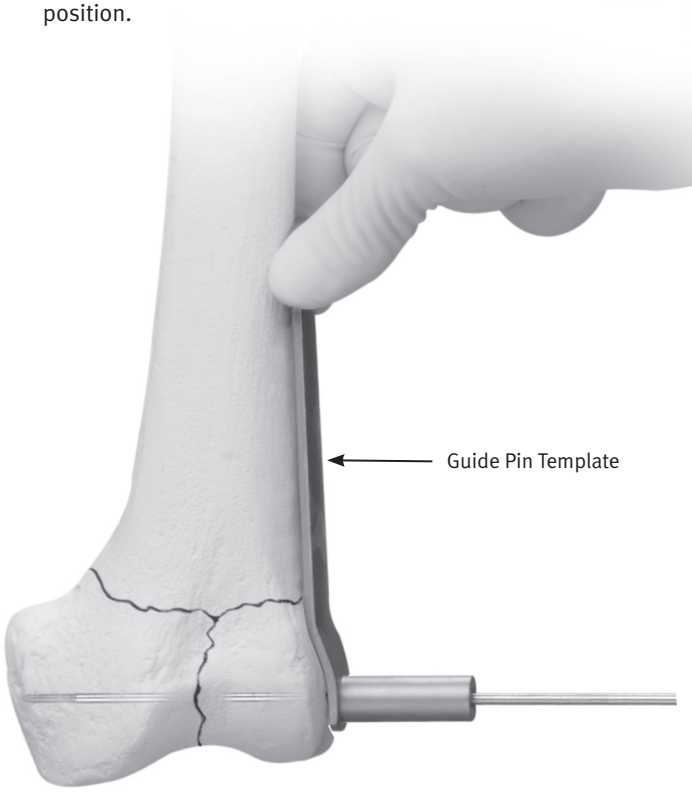


Fig 19. Guide Pin Placement

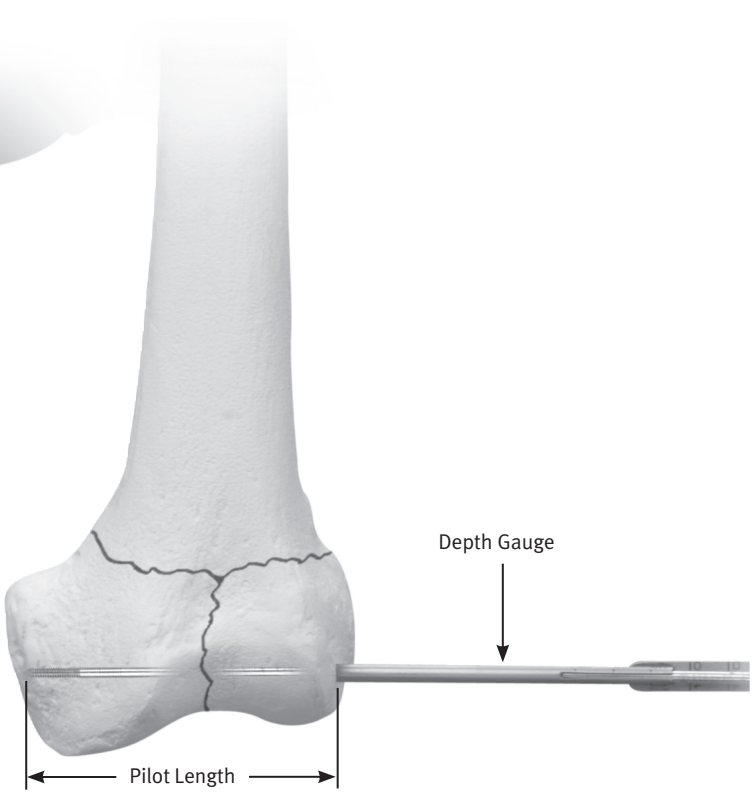


Fig 20. Pilot Length Measurement

For young patients with healthy bone, ream to the pilot length to make lag screw insertion easier. In elderly patients with osteopenic bone, ream to a depth of 10mm shorter than the pilot length to enhance screw purchase in the bone.

Use the Lag Screw Reamer with the Reamer Head, Short only. This will ensure that the reamer head does not cross the fracture site. The reamer is designed to countersink the lateral femoral cortex for optimal side plate placement, flush against the bone. Ream to the point where you countersink as shown in Fig. 21. The depth of reaming may be checked (or affirmed) by image intensification. If the guide pin is pulled out when the reamer is extracted, use the **Guide Pin Relocator** to replace it.

The reamed lag screw channel may be tapped using the **Cannulated Bone Tap**. Assemble the **Cannulated Bone Tap** with the subcomponents; bone tap guide and bone tap stop. Set the bone tap stop by placing the back of the collar with the desired millimeter setting read at the back in the same manner as the reamer (Fig. 22). Tapping is usually not needed with osteopenic bone.

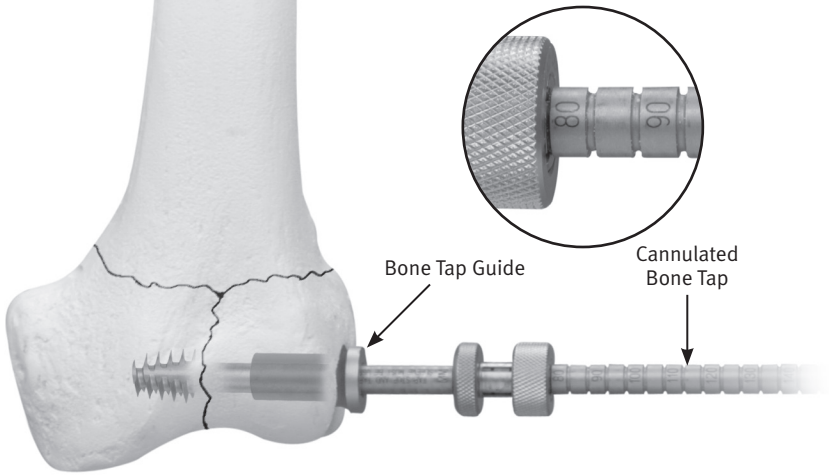


Fig 22. Tapping

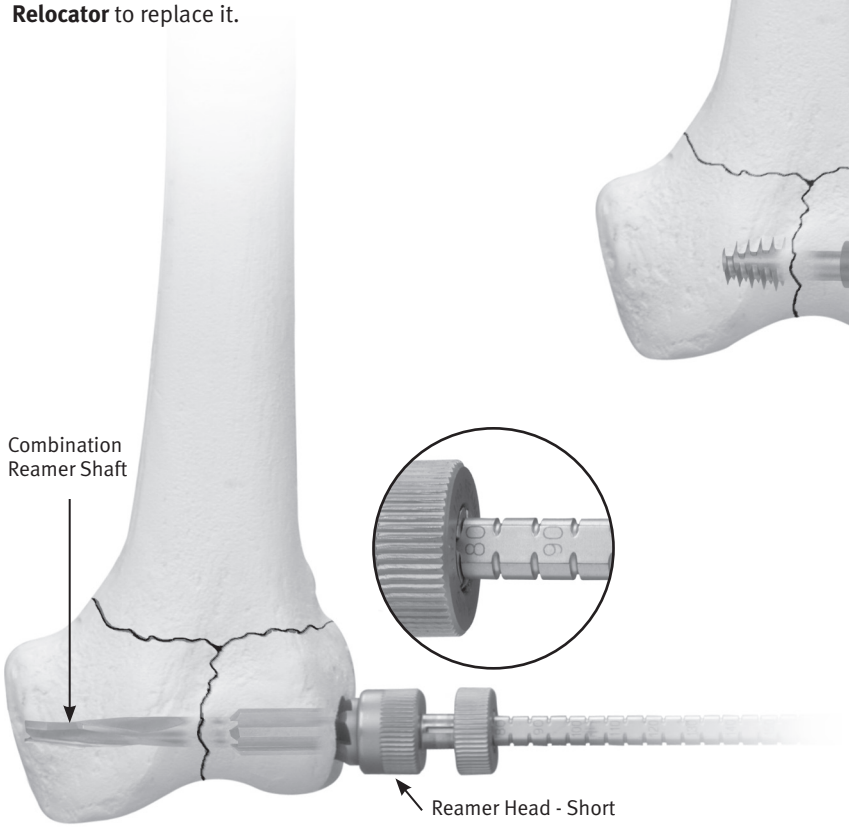


Fig 21. Reaming Depth

Determining the Lag Screw Length

Determine the lag screw length from the "pilot length." When pilot length is between the available incremental lag screw lengths, select the longer of the two. In osteopenic patients, it may be desirable to use a lag screw with extra-wide threads (VersaFx II Lag Screw, Large Thread - 15.8mm diameter threads) in order to increase the purchase in the medial condyle.

Insertion of the Implant

Assemble the **T-handle** onto the **Linked Lag Screw Inserter** and place the selected tube/plate onto the recessed diameter of the inserter. Place the appropriate length lag screw into the driving tip of the instrument. Then place the entire assembly over the guide pin and insert it into the prepared lag screw channel (Fig. 23). The T-handle of the inserter and the shaft of the tube/plate should be parallel to the shaft of the femur as the screw is inserted to. After inserting the lag screw, move the tube/plate into position over the lag screw with the barrel resting in the lag screw channel. If desired, clamp the tube/plate to the shaft of the femur. At this point, there should be solid fixation of the condyles.

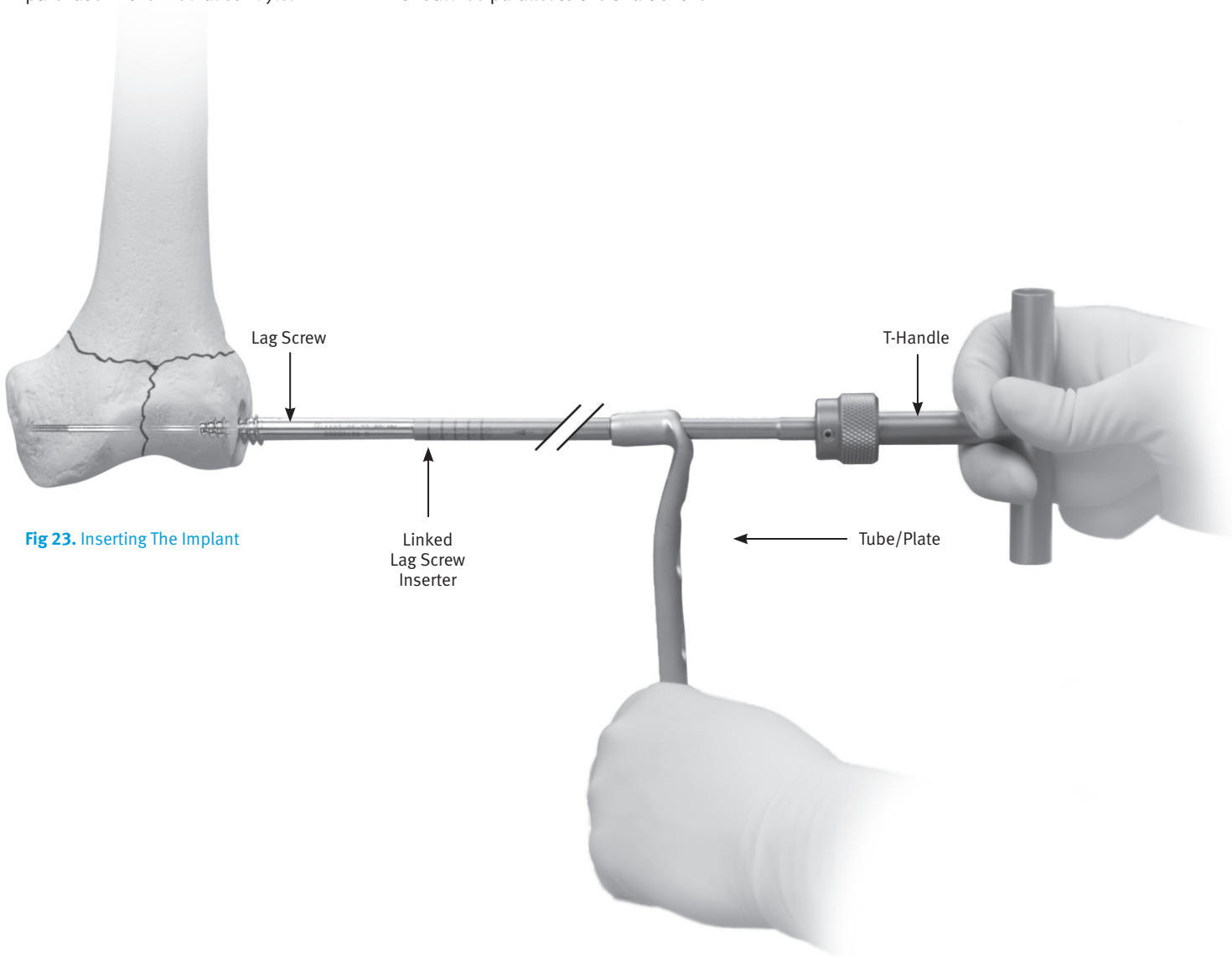


Fig 23. Inserting The Implant

Fig 24. Drilling For Side Plate Insertion Screws

Attaching the Side Plate

Check to be sure that reduction of the supracondylar portion of the fracture has been accomplished. Fix the side plate to the lateral femoral cortex using either 4.5mm diameter bicortical bone screws, 6.5mm cancellous, or 7.0mm cannulated screws. The larger 6.5mm and 7.0mm screws are helpful in capturing medial fragments. Each hole should be sequentially drilled, measured and tapped, and the appropriate length screw should be inserted in a neutral position (Figs. 24 and 25).

If necessary, place bone graft at the fracture site.

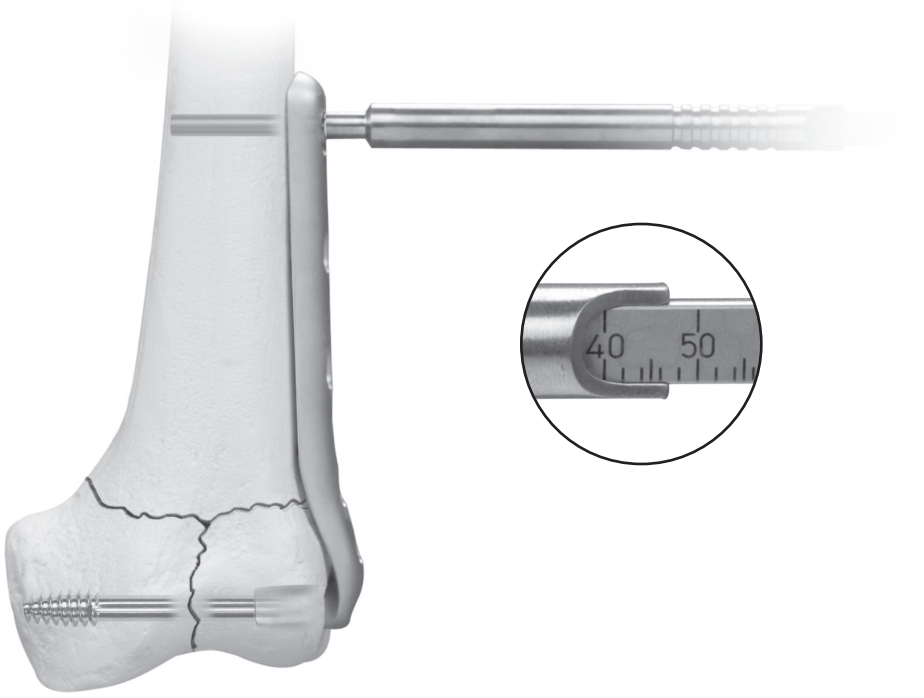


Fig 25. Measuring Screw Depth

Impaction (Optional)

If you elect to impact the fracture, use the Impactor. (If bone graft will be used at the fracture site, the graft should be inserted before impaction.)

Carefully tap on the Impactor with a mallet while monitoring the degree of impaction (Fig. 26).

Use of a compression screw is recommended in all cases to ensure adequate overlap of the screw in the tube as well as to achieve further impaction (Fig. 27). **However, it is important to avoid excessive force with compression or impaction because the lag screw may strip the threads in soft bone.**

The required compression screw length varies by case and is dependent upon the lag screw length and fracture gap prior to compression. If too long of a compression screw is initially utilized upon insertion, it may bottom out in the lag screw, preventing the fracture from being fully compressed. Compression screws are available in seven lengths ranging from 1/2 inch to 2 inch lengths in quarter inch increments. The recommended starting length is 1 inch and may be adjusted accordingly.

In osteopenic patients, it may be desirable to use a lag screw with extra-wide threads (VersaFx II Lag Screw, Large Thread - 15.8mm diameter threads) in order to increase the purchase in the medial condyle. Use image intensification to examine the fracture alignment and hardware position.

After compression is achieved, the compression screw may be removed.

Final radiographs should be obtained before closing to make certain that the fracture is completely compressed and there is no gap or abnormal angulation at the fracture site (Fig. 28).

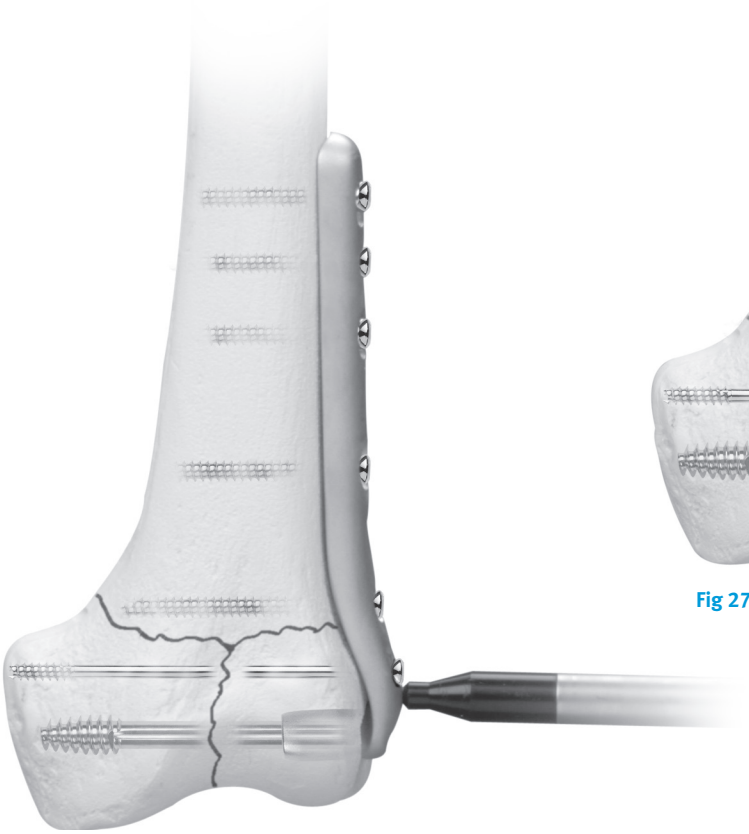


Fig 26. Impaction

Fig 27. Inserting The Compression Screw

Wound Closure

Irrigate the wound. Place closed suction drains in the wound and use for 48 hours postoperatively. Close the wound with interrupted absorbable sutures in muscle, fascia and subcutaneous tissues. Close the skin with staples and apply a pressure dressing.

Postoperative Care

Encourage the patient to sit in a chair on the first postoperative day. On the second postoperative day, begin physical therapy for non weight-bearing ambulation training. Use serial X-rays to document healing. When appropriate, gradually increase weight bearing as healing progresses.

Extraction

Extract the cortical screws, cancellous screws, and tube/plate in the usual manner. Use the **Lag Screw Extractor** to extract the lag screw, without using the inserter. Insert the extractor shaft into the lag screw hole where the tube/plate has been previously extracted, fitting into the large hexagonal part of the lag screw shaft. To assemble the Lag Screw Extractor, insert the **Extractor Link** into the lumen of the **Extractor Shaft**, and then screw the **Lag Screw Extractor** into the lag screw. After the lag screw is attached to the Lag Screw Extractor, attach the T-handle, and extract the lag screw by turning counterclockwise.

Fig 28. Final Implant Position

Instruments

Prod. No.	Description
00-1193-000-00	Complete Instrumentation Set in Sterilization Storage Tray (Includes all the following, which may be ordered individually:)
00-1180-040-00	Depth Gauge 9 in. (for lag screws)
00-1193-002-00	Combination Reamer Shaft
00-1193-004-00	Reamer Head, Standard
00-1193-003-00	Reamer Head, Short
00-1193-005-00	Cannulated Bone Tap (Includes bone tap guide and bone tap stop)
00-1193-006-00	Impactor
00-1193-008-00	T-Handle
00-1193-009-00	Lag Screw Extractor (Includes 1193-09-01/1193-09-02)
00-1193-010-00	Adjustable Double Pin Guide
00-1193-012-00	Linked Lag Screw Inserter (Includes 1193-12-01/1193-12-02)
00-1193-014-00	Cannulated Bone Tap, Large (For use with bone tap guide and bone tap stop)
00-1193-090-00	Sterilization Case (Includes 6 parts)
00-1193-022-00	90° Guide Pin Template
00-1193-023-00	95° Guide Pin Template
00-1199-008-00	Pin Relocator
00-1291-004-00	Long Drill, 1/4in (6.4mm) Diameter, 8in (20.3cm) Length
00-4812-045-05	Large Holding Sleeve
00-4812-045-01	Large Hex Screwdriver Shaft
00-4812-045-00	Large Hex Screwdriver
00-4810-003-01	Depth Gauge, Large (for non-lag screws)
00-4808-045-01	Double Drill Sleeve, 4.5mm/3.2mm
00-4808-045-05	4.5mm Compression Drill Guide
00-4808-065-01	Double Drill Sleeve, 6.5mm/3.2mm
00-4812-001-00	Self-Holding Screw Forceps, Standard
00-4811-035-00	T-Handle, Quick-Connect
00-4811-125-45	Tap, Quick-Connect, 4.5mm 125 Length
00-4811-196-65	Tap, Quick-Connect, 6.5mm 196mm Length
00-4806-145-32	Drill Bit, Quick-Connect, 3.2mm Diameter 145mm Length
00-4817-001-00	Sharp Hook

Optional	(Not included in instrument set 1193-00:)
00-1180-034-00	Standard Tube Reamer Head, 15mm Diameter
00-1181-020-00	Threaded Guide Pin, 3.2 x 230mm (Presterile package of 5)
00-1163-030-00	Fixed Angle Guide 130 Degree
00-1163-035-00	Fixed Angle Guide 135 Degree
00-1163-040-00	Fixed Angle Guide 140 Degree
00-1163-04500	Fixed Angle Guide 145 Degree
00-1163-050-00	Fixed Angle Guide 150 Degree
00-1193-013-00	Centering Sleeve
00-1193-015-00	Calibrated Guide Wire, 3.2 x 230mm (Presterile package of 5)
00-1193-016-00	Cannulated Bone Tap (For use with 1193-13)
00-1193-017-00	Cannulated Bone Tap, Large (For use with 1193-13)
00-4816-004-00	Stag beetle Forceps,125mm
00-4806-195-32	Drill Bit Quick-Connect 3.2mm Diameter 195mm Length

Replacement Item	
00-1193-006-01	Impactor Nose (For 1193-06)
00-1193-010-05	Replacement Parallel Guide
00-1193-009-01	Replacement Extractor Drive Link
00-1193-009-02	Replacement Extractor Drive Shaft
00-1193-012-01	Replacement Inserter Drive Link
00-1193-012-02	Replacement Inserter Drive Shaft

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