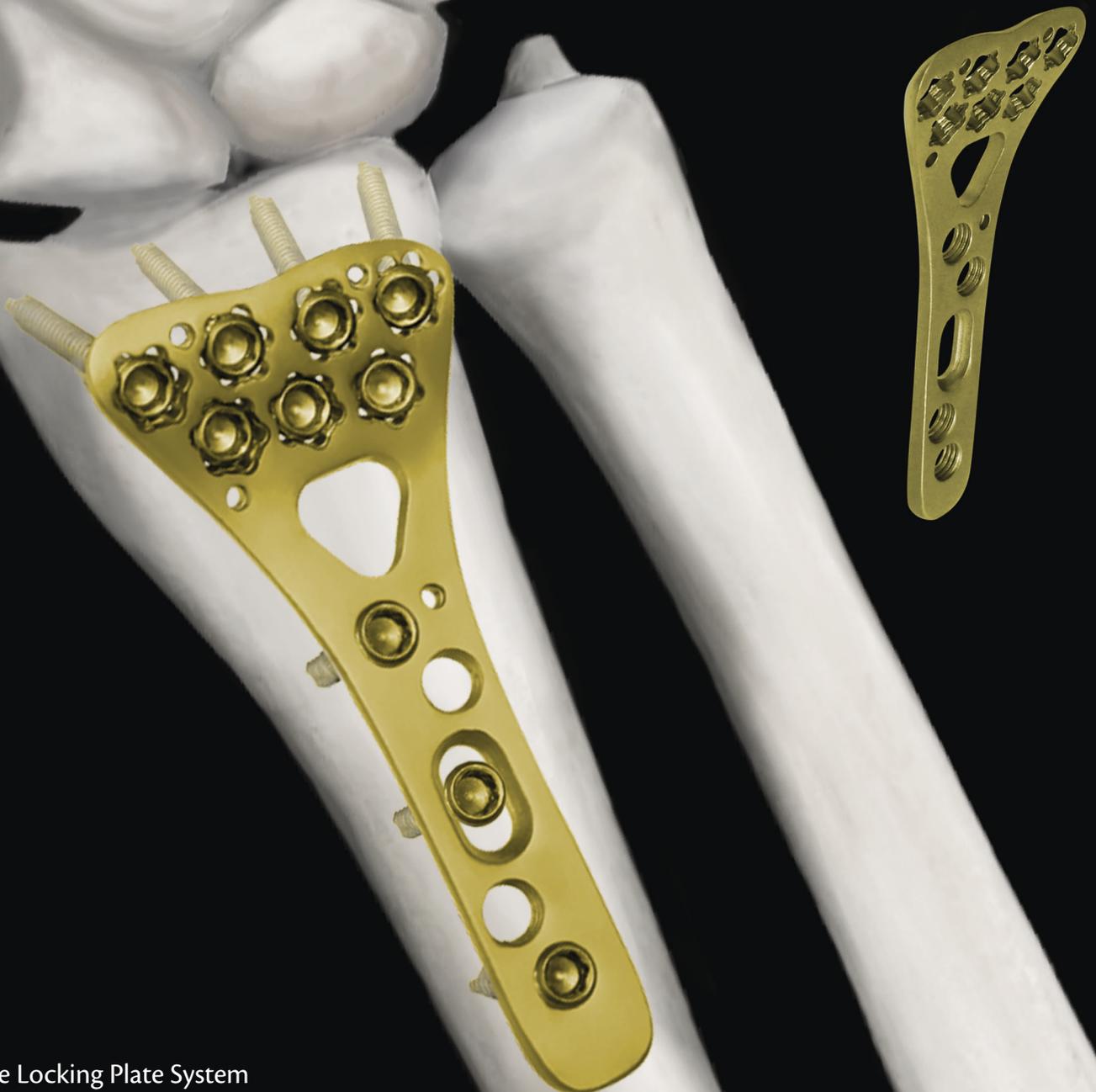


SURGICAL TECHNIQUE

ALP Titanium distal radius plate

**Lionter**  
RADIO DISTAL



Advance Locking Plate System

**TRAUFIX**  
READY TO RUN

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## TECHNOLOGICAL ADVANTAGES

Over time, distal radius fracture is positioned as the most common fracture of humans, regardless of age (See image 1).

In recent years, the treatment of this lesion has undergone some changes in the way the fragments stabilize, being the placement of the volar plate by palmar approach, one of the most used treatments recently, since depending on the type of damage, it can offer us some advantages, one being the direct view of the injury, allowing a better reduction of the palmar cortical, greater control of the fragments (See image 2), better handling of soft tissues, greater coverage of plate with soft tissues (square pronator) at the close of injury and therefore ensure less irritation of the tendons that will be reflected in better function.

For this type of injury, some of the osteosynthesis methods are based on the principle of the variable angle system (See image 3), which maintain the reduction, giving a better short and long term function, by means of a palmar approach, without the need to add bone tissue (or do so at the surgeon's decision), in this way it can significantly decrease some of the post-operation complications, such as an inadequate reduction of the fragments that requires some revision or can lead to an early osteoarthritis of the radio carpal joint.

**Lionter distal radius ALP plate** is an implant that can be placed through a palm approach and is capable of providing angular stability, which allows a fixation of the fracture according to the type of fragments present. It also provides flexibility to lock the screws in different directions, in reference to the central axis of the plate. As a result, support to the joint surface is generated and several stability options are obtained for a wide variety of fractures, thus creating a locked assembly that provides the angular stability necessary for better consolidation of the injury (See image 4).



Image 1 Distal radius fracture



Image 2



Image 3. Multidirectional Angular Stability ( $\pm 15^\circ$ ) Threaded Screw



Image 4. Post-surgical control

## PLATE DESCRIPTION

- ALP titanium distal radius plate Lionter is available of Titanium alloy (Ti6Al4V ELI) grade 23 ASTM F136, special for surgical implants.
- The plate has 3 options of length 3, 5 and 7 holes in the shaft. And two presentations, with distal rows of 5 (3 holes in the first row and 2 in the second) and 7 (4 distal holes and 3 in the second row).(See image 5).
- It has the option of locking variable angle of 15° in each of the holes of the head for the Traufix ALP screws of 2.5mm (See image 6) and for the radial hole of the first row it has an angle of 18° towards distal and 10° to external. In the second row there is 16° towards distal and 10° to external, in order to fix the radial styloides by means of two screws.
- Fixation of the styloid process of the radius, stabilization of the lunate surface, as well as the metaphysarian zone of the distal radius, can be enhanced by the 2.5mm Traufix ALP screws.
- The plate can be preliminarily fixed as it has 1.1mm Kirschner wire holes (See image 7).
- The plate has an oval hole (See image 8) To place it on the radius precisely and initially, place the screw in that hole, allowing the plate to be raised or lowered according to the surgeon's need. And then make the final placement of the screws of the first distal row once the reduction of the fragments has been made.
- The plate offers anatomical molding suitable for distal radius, as well as rounded edges and a polished surface, in addition, a very low distal profile to reduce the risk of soft tissue irritation, without limiting its firmness and the transmission of loads.
- There are left and right plates duly identified for ease of use and handling.



Image 5



Image 6



Image 7



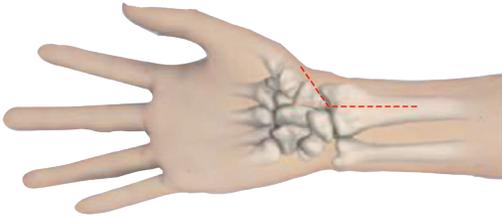
Image 8

## SURGICAL INDICATIONS

1. Intraarticular and extraarticular distal radius fractures.
2. Correction osteotomies.

## CONTRAINDICATIONS

1. Active infections or suspected active infection at the site or near the implant.
2. Known allergies and/or hypersensitivity to foreign bodies.
3. Insufficient or inappropriate bone substance for safe anchoring of the implant.
4. Uncooperative patients.
5. Patients who do not accept its use.



## DESCRIPTION OF THE SURGICAL TECHNIQUE

### Approach

Once the anesthetic procedure has been done and the asepsis protocol chosen, under ischemia support, we incise the previous modified Henry approach, in the distal third of the forearm. It is suggested to start with a longitudinal, slightly radial incision on the radial edge of the FCR tendon (flexor carpi radialis) and radial artery, with a distal angulation of the incision of 45° in comparison to the first one (See image 9), to allow better vision towards the radius styloids and respect the path of the artery and the FCR tendon (See image 10). By blunt dissection of the flexora musculature, should be carefully separated, exposing the pronator quadratus (See image 11). Once this is done, the pronator quadratus muscle of the lateral edge of the radius should be uninserted, (leaving 2mm for reinsertion with sutures, after finishing osteosynthesis) and lift it towards the ulna in a flap form. This will allow you to have a full view of the fracture (See image 12) and greater care of soft tissues.

With soft and flex-extension traction maneuvers perform fragment reduction. You can place your flexed hand, supported by an assistant, in order to maintain the reduction. If so decided, the different support options may be used, for reduction offered by the Lionter distal radius ALP plate system (reduction forceps and fastening material).

**Important:** Leave the wrist volar capsule intact to prevent vascular damage to the fragments, and injury to the volar ligaments.



Image 9



Image 10



Image 11

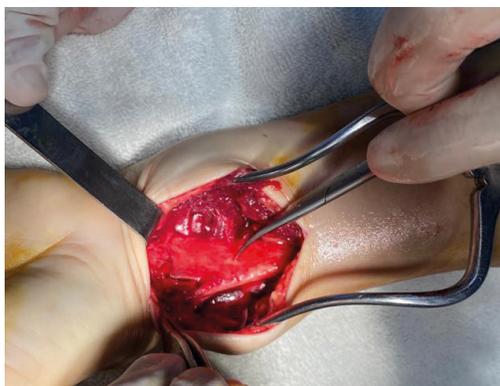


Image 12

## Implant Selection

Select **Lionter distal radius ALP plates** based on the type of fracture and radius anatomy. Make sure you have chosen the correct plate by comparing it to the L (left) or R (right) mark on the plate shaft (See image 13).

## Fracture reduction and plate placement

The method of reduction used will depend in each case on the type of fracture. By gentle handling of the fragments, place the plate, so that it fits the volar surface, following the water line that orients us towards the concave surface of the distal radius, which must be contemplated, thus avoiding the subsequent introduction of screws into the Joint Zone.

Once the reduction has been made and only if the surgeon considers necessary, the 1.1mm Kirschner wires should be inserted through the small hole (marked in red circle) that he deems appropriate, in order to temporarily fix the plate on the distal part of the radius, and have a view of its location, thus allowing it to be repositioned if necessary (See image 14).

The order of insertion of the screws and the use of Kirschner wires may vary depending on the type of fracture and the reduction technique. Obtain multiple X-ray images of the distal section of the radius, in various projections, to check the alignment and reduction of the fracture, as well as the proper placement of the plate.

Alternate method: Use of reduction wires.

1.1mm plate reduction wires can be used for preliminary plate fixing and should be removed when no longer necessary for provisional fixation. Extra support equipment is also offered for fragment reduction and fixing of the Lionter distal radio ALP plate.

**Note:** Kirschner's 1.1mm reduction wires are for single use only; must not be reused (See image 15).

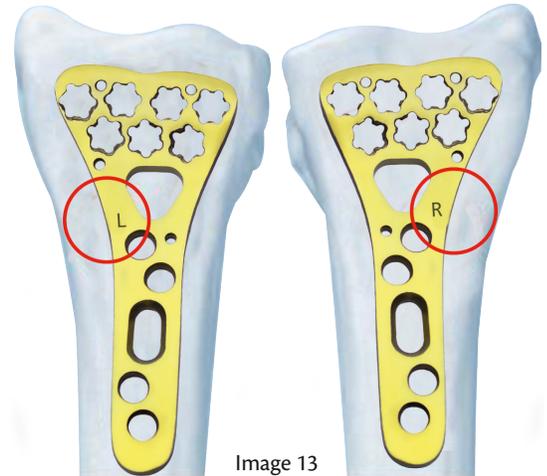


Image 13

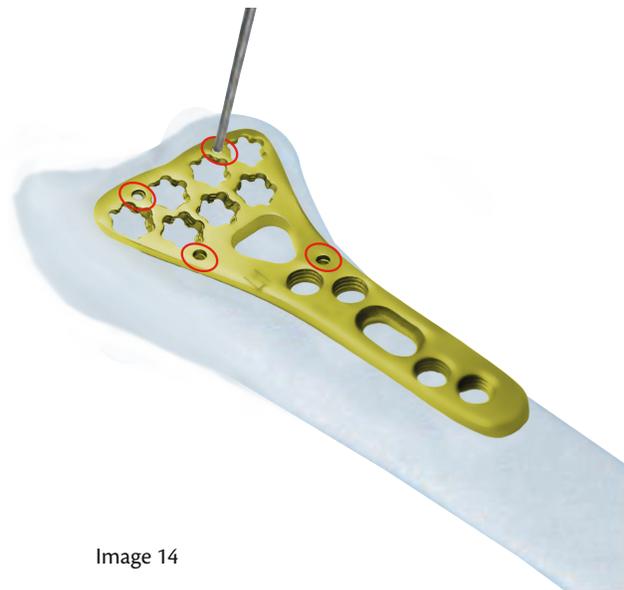


Image 14

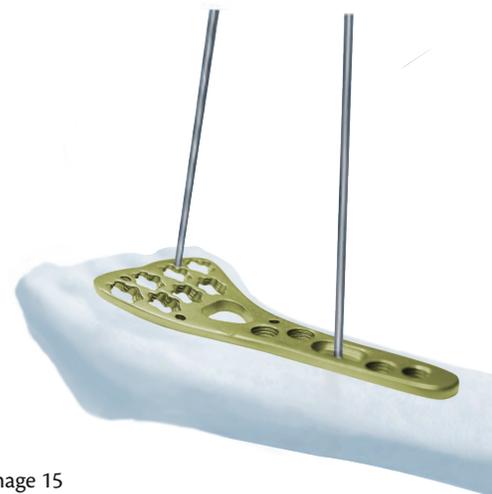


image 15

### Screw placement techniques

Before proceeding to explain the surgical technique it should be known that there are two different forms for inserting the screws into the plate: Variable angle technique and predefined normal angle technique, which will be detailed below.

### Angulation of screws

The LIONTER distal radius ALP plate features holes ordered in two rows in the distal part, which allow the placement of Traufix ALP locking screws with variable angles of up to 15°, allowing various types of fractures to be treated. (See images 16 and 17)

When planning the placement of the screws, especially if the nominal angle of the paths is used, we suggest consulting the angulation charts below. The reference value for all angles provided is the plate shaft, with 0° angulation for the screws.

### Caution

This description of the technique is not sufficient for its immediate clinical application. Hands-on learning with an experienced surgeon is highly recommended.

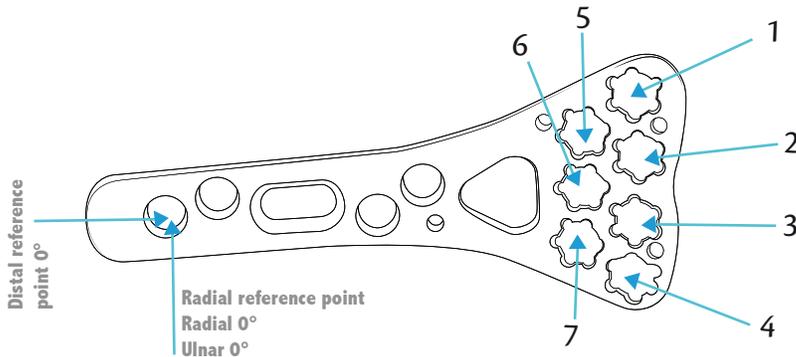


Image 16

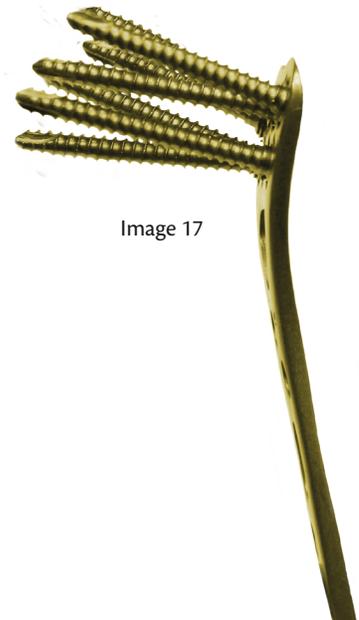


Image 17

### Plate with 7 holes in the head

ANGLES	FRONTAL(°)	LATERAL(°)
1	10-14	10-14
2	1-3	1-3
3	1-3	1-3
4	11-15	1-5
5	8-12	8-12
6	3-7	1-3
7	6-10	1-3

Plate table 7 holes

Start with the oval hole in the plate shaft and drill with the 2.0mm drill bit through the 2.5/2.7mm DCP double screw guide. (See image 18).

Measure the depth using the special depth gauge for **ALP distal radius plate LIONTER**

Insert a 2.5mm cortical screw through the elongated hole in the plate shaft. Adjust the required position of the plate (this hole allows you to move the plate to distal or proximal, depending on the surgeon's need up to a range of 10mm), and tighten the screw (See image 19).

### Insertion of Distal Screws

Determine in which holes, of the two distal rows offered by the plate, the 2.5mm Traufix ALP locking screws will be used.

### Drill with drill guide (128.20X)

The fixed angle end of the drill guide only allows the bit to follow the nominal path of the locking hole. Place the drill guide over the hole of the previously selected plate. Then with the 2.0mm bit perform the drilling. Determine the screw length with the help of the corresponding depth meter (See image 20).

**Note:** The direction of the predefined angle for the different holes is indicated in the reference chart on page 5.

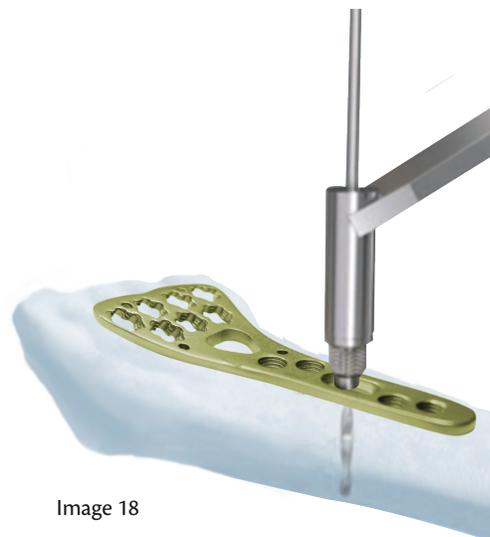


Image 18

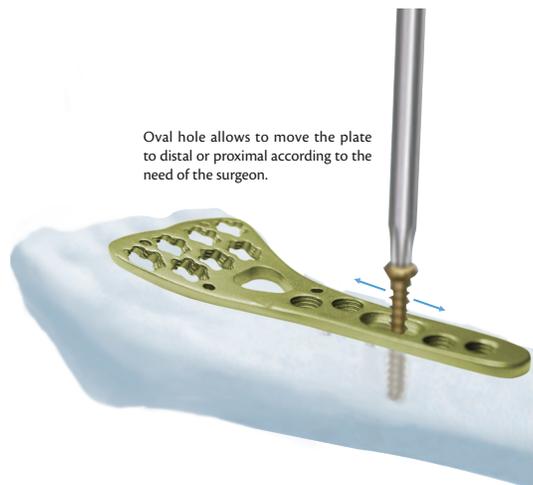


Image 19



Image 20

### Insertion of Locking Screws

Remove the drill guide and place the selected screw according to the previous measurement.

Enter the ALP Traufix locking screws manually, by following the most distal and according to the need of the surgeon, give the necessary angulation. To do this, use the 2.5mm torx screwdriver, and tighten only enough for the screw head to completely lower into the locking hole (See image 21). Do not overtighten the screw. This will allow you to easily remove the screws in case they are not in the desired position, or you need to make some change of measurement.



Image 21

### Insertion of Proximal Screws and Locking Screws

In the case of proximal locking screws, carefully insert the 2.0mm Traufix ALP system bit guide with scale, perpendicular to the plate and aligned with the hole shaft, until it is seated in the desired locking hole. Drill with 2.0mm bit. Read the screw length directly on the laser mark of the bit. You can also determine the screw length using the corresponding depth meter (See image 22).

Insert a Torx Titanium Traufix ALP locking screw with the 0.8Nm dynamometric adapter. (See image 23).

The dynamometric adapter prevents excessive tightening and ensures that the Traufix ALP locking screws are firmly locked on the plate.

**Note:** In case of dense bone, visually check if the screw is hidden after tightening it with the dynamometric adapter. If necessary, tighten it carefully without the dynamic adapter until the screw head is aligned with the plate surface.



Image 22

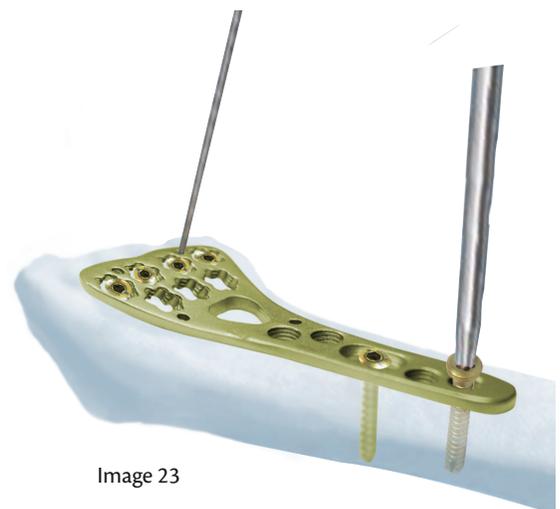


Image 23

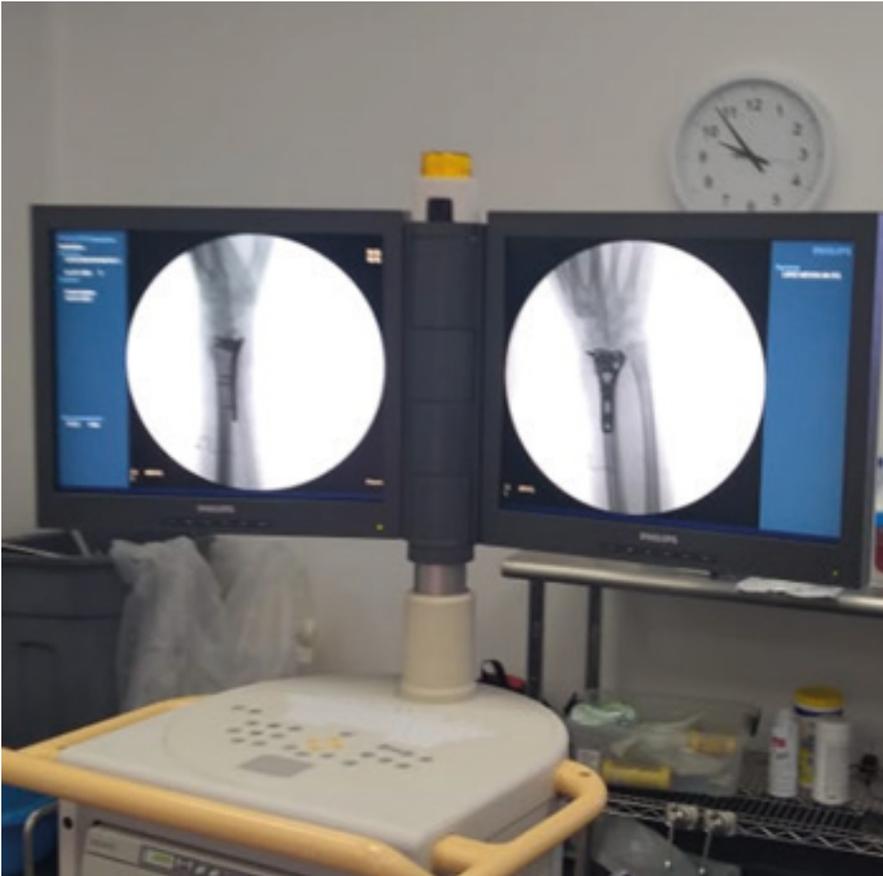


Image 24

### Joint Reconstruction Check

Once the placement of Lionter distal radius ALP plate and Traufix ALP 2.5mm locking screws has been done, obtain X-ray images in different projections (See image 24), to confirm that the joint reconstruction, the placement of the screws and the length thereof, are correct. (AP, lateral, supinated oblique, pronated oblique and distal radius tangential projection suggested).



Image 25



Image 26

Check that the distal screws do not reach the joint with complementary projections; for example:

- 1.- Side projection. It should be taken with 10° elbow flexion, relative to the support surface. (See image 24)
- 2.- Anteroposterior projection. It should be taken by resting the forearm and hand on the same surface. (See image 25)
- 3.- Tangential x-rays can be taken directly on the fluoroscope by flexing the wrist. They should also be taken under the same image scheme anteroposterior pronated and anteroposterior supined, in order to assess the greater introduction of the locking screws, on the dorsal compartments (See image 26).

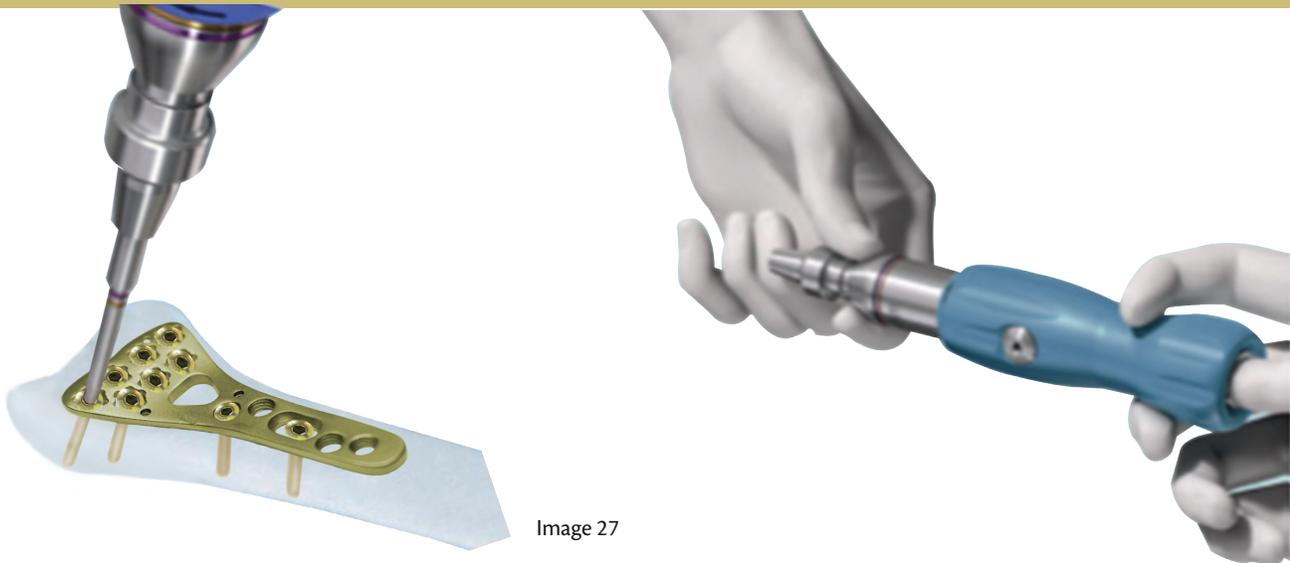


Image 27



Image 28

### Definitive fixing of Variable Angle Screws

Use the 0.8Nm dynamometric adapter to perform the end locking of the Traufix ALP locking screws (See image 27).

The dynamometric adapter prevents excessive tightening and ensures that the locking screws are firmly locked on the plate.

**Note:** In case of dense bone, visually check if the screw is hidden after tightening it with the dynamometric adapter. If necessary, tighten it carefully without the dynamometric adapter until the screw head is aligned with the plate surface.



Image 29

Once the reduction and osteosynthesis of the fracture with the material you have selected has been done, and finally in radiographic controls its proper placement has been seen, we will proceed to the closure of the surgical wound, washing tissues, the reinsertion of the square pronator is started (See image 28), making sure to cover the plate and screws carefully. It is then sutured in planes, ending the closure of the skin (See image 29).

Immobilization of the limb or placement of a soft and soft bandage will be up to the surgeon's discretion. Finalizing the surgical procedure.

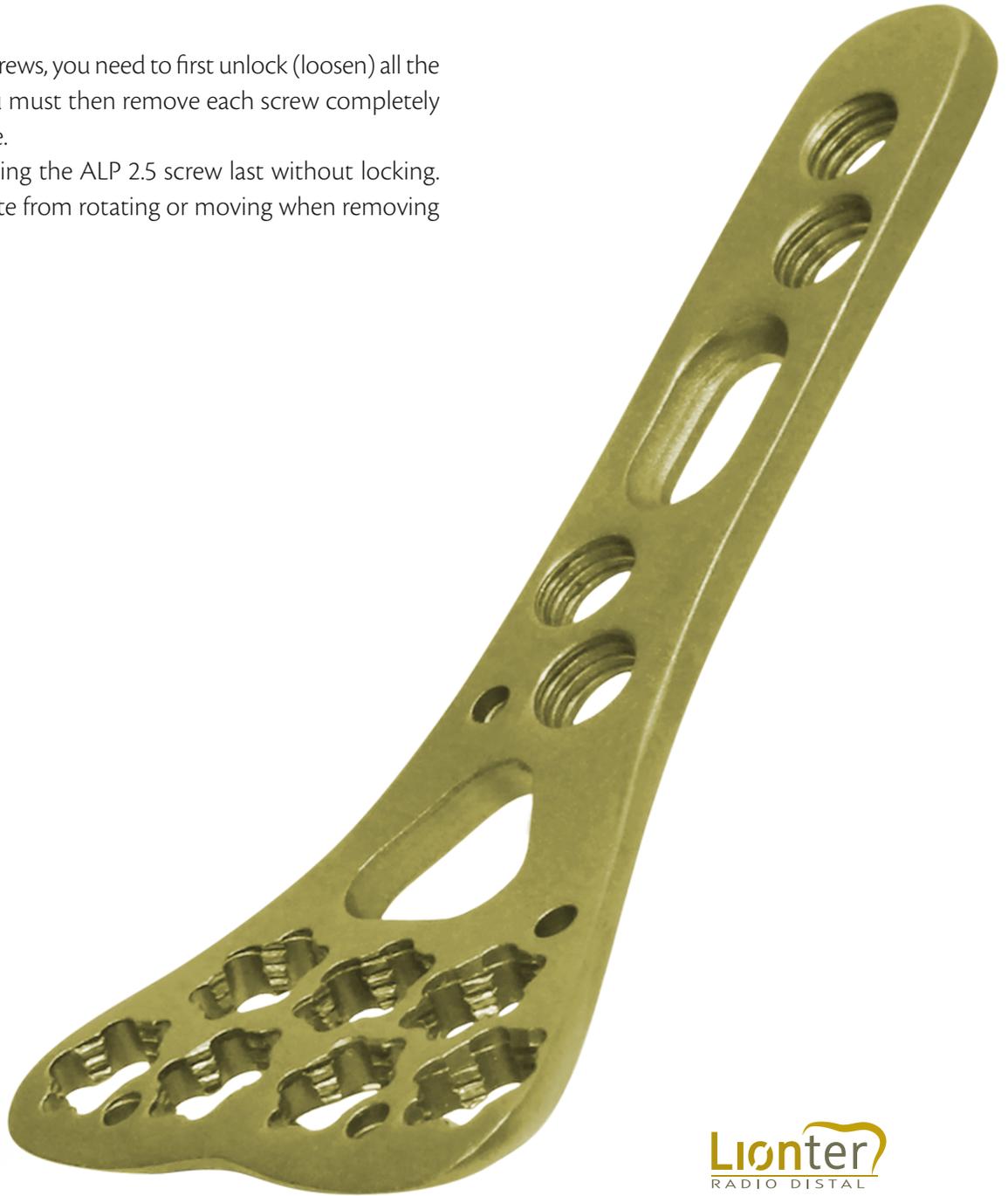
### Post-operation Treatment

Post-operation treatment for **LIONTER distal radio ALP plates** does not differ from what is usual for traditional osteosynthesis material procedures.

### Implant Removal

To remove the locking screws, you need to first unlock (loosen) all the screws on the plate. You must then remove each screw completely from the bone and plate.

Next, we suggest removing the ALP 2.5 screw last without locking. This will prevent the plate from rotating or moving when removing the other screws.



**Lionter**  
RADIO DISTAL

## IMPLANTS AND INSTRUMENTS

### PLATES

#### ALP TITANIUM DISTAL RADIUS PLATE LIONTER RIGHT

148.03 ALP titanium distal radius plate LIONTER 3 holes right

148.05 ALP titanium distal radius plate LIONTER 5 holes right

148.07 ALP titanium distal radius plate LIONTER 7 holes right

#### ALP TITANIUM DISTAL RADIUS PLATE LIONTER LEFT

149.03 ALP titanium distal radius plate LIONTER 3 holes left

149.05 ALP titanium distal radius plate LIONTER 5 holes left

149.07 ALP titanium distal radius plate LIONTER 7 holes left

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#### ALP TITANIUM DISTAL RADIUS PLATE LIONTER S RIGHT

148.03S ALP titanium distal radius plate LIONTER S 3 holes right

148.05S ALP titanium distal radius plate LIONTER S 5 holes right

148.07S ALP titanium distal radius plate LIONTER S 7 holes right

#### ALP TITANIUM DISTAL RADIUS PLATE LIONTER S LEFT

149.03S ALP titanium distal radius plate LIONTER S 3 holes left

149.05S ALP titanium distal radius plate LIONTER S 5 holes left

149.07S ALP titanium distal radius plate LIONTER S 7 holes left

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#### ALP TITANIUM DISTAL RADIUS PLATE LIONTER L RIGHT

148.08L ALP titanium distal radius plate LIONTER L 8 holes right

148.10L ALP titanium distal radius plate LIONTER L 10 holes right

148.12L ALP titanium distal radius plate LIONTER L 12 holes right

#### ALP TITANIUM DISTAL RADIUS PLATE LIONTER L LEFT

149.08L ALP titanium distal radius plate LIONTER L 8 holes left

149.10L ALP titanium distal radius plate LIONTER L 10 holes left

149.12L ALP titanium distal radius plate LIONTER L 12 holes left

## Screws

### 2.5mm TITANIUM CORTEX SCREW TORX DRIVE

154.08X	2.5mm titanium cortex screw 8mm torx drive
154.10X	2.5mm titanium cortex screw 10mm torx drive
154.12X	2.5mm titanium cortex screw 12mm torx drive
154.14X	2.5mm titanium cortex screw 14mm torx drive
154.16X	2.5mm titanium cortex screw 16mm torx drive
154.18X	2.5mm titanium cortex screw 18mm torx drive
154.20X	2.5mm titanium cortex screw 20mm torx drive
154.22X	2.5mm titanium cortex screw 22mm torx drive
154.24X	2.5mm titanium cortex screw 24mm torx drive
154.26X	2.5mm titanium cortex screw 26mm torx drive
154.28X	2.5mm titanium cortex screw 28mm torx drive
154.30X	2.5mm titanium cortex screw 30mm torx drive

### 2.5mm TITANIUM CORTEX LOCKING SCREW TORX DRIVE

155.08X	2.5mm titanium cortex locking screw 8mm torx drive
155.10X	2.5mm titanium cortex locking screw 10mm torx drive
155.12X	2.5mm titanium cortex locking screw 12mm torx drive
155.14X	2.5mm titanium cortex locking screw 14mm torx drive
155.16X	2.5mm titanium cortex locking screw 16mm torx drive
155.18X	2.5mm titanium cortex locking screw 18mm torx drive
155.20X	2.5mm titanium cortex locking screw 20mm torx drive
155.22X	2.5mm titanium cortex locking screw 22mm torx drive
155.24X	2.5mm titanium cortex locking screw 24mm torx drive
155.26X	2.5mm titanium cortex locking screw 26mm torx drive
155.28X	2.5mm titanium cortex locking screw 28mm torx drive
155.30X	2.5mm titanium cortex locking screw 30mm torx drive

## INSTRUMENTS

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

### BASIC INSTRUMENTS

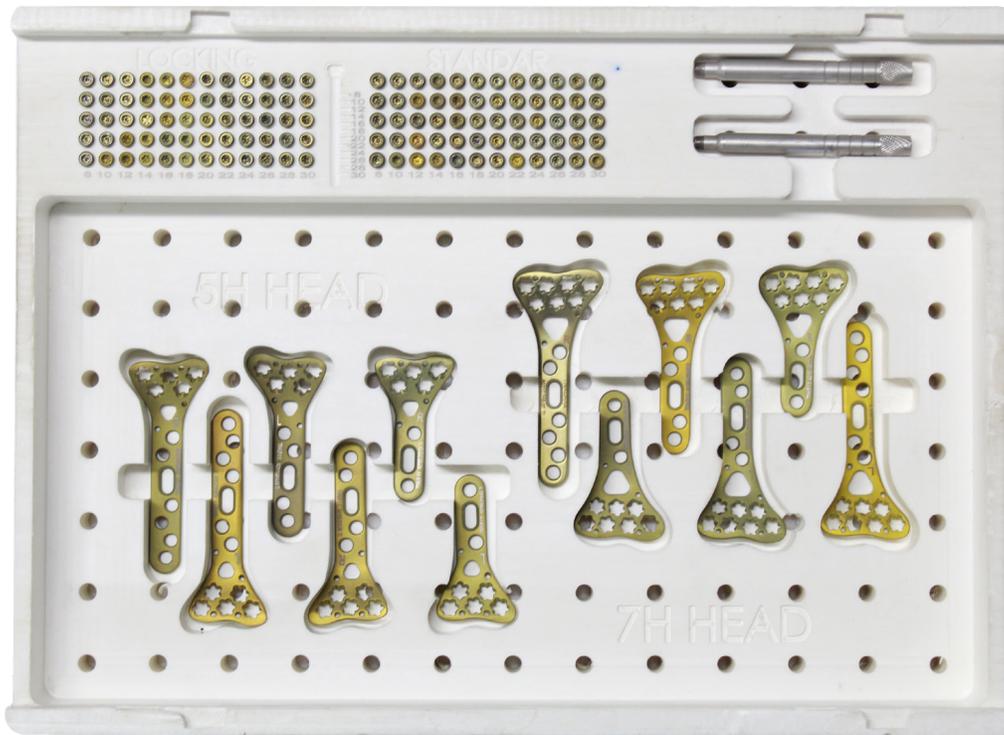
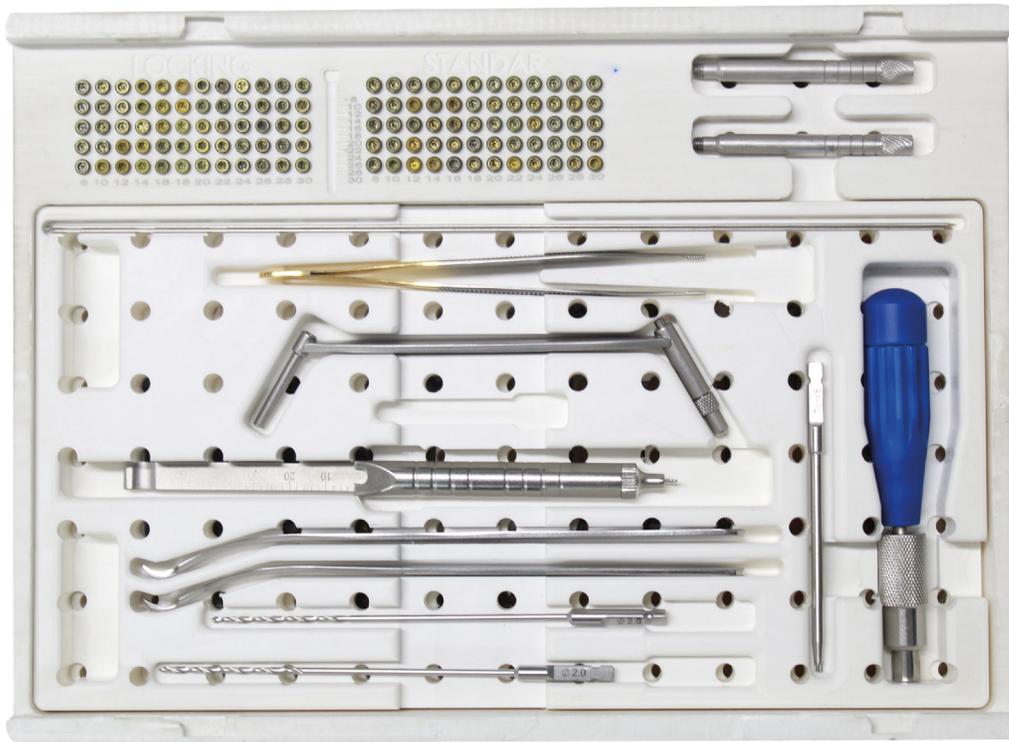
CODE	DESCRIPTION
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128.20X	Drill guide Lionter for 2.0mm drill bit
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**QTY.**

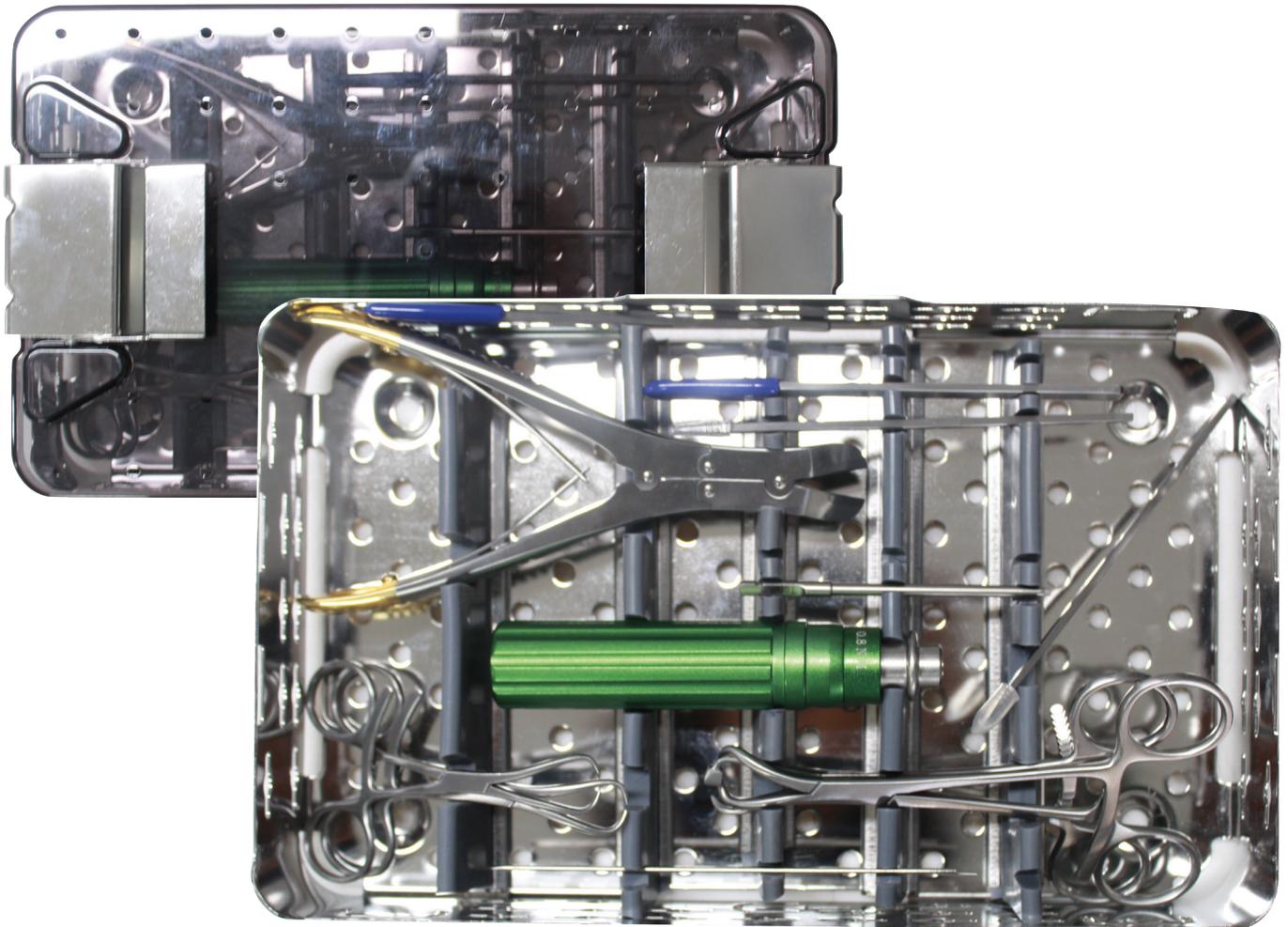
2	2.0mm drill bit fast-coupling
1	Screwdriver
1	2.5mm Torx screw tip, self-supporting, quick coupling
1	Depth gauge for screws up to 50mm
1	2.0mm/2.7mm double drill guide
1	Adson Brown Forceps
2	6mm Hohman retractor





## SUPPORT EQUIPMENT

QTY.	DESCRIPTION
1	Wire cutting forceps, 160mm long
2	Reduction forceps tip-tip, 100mm long
1	Bone forceps, 135mm long
1	Field type reduction forceps, 140mm long
1	End stop forceps, 120mm long
1	Quick coupling torque wrench of 0.8Nm
1	2.5mm Torx screw tip, self-supporting, quick coupling
1	Mini-lambotte osteotome 3mmx125mm
1	Mini-lambotte osteotome 4mmx125mm
1	Mini-lambotte osteotome 6mmx125mm
1	Mini-lambotte osteotome 8mmx125mm
1	Spoon, 2mm







**Lionter**  
RADIO DISTAL



Exclusive distributor in Mexico



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**FIXIER S.A. DE C.V.**

Carretera Doctor Mora a San Miguel de Allende km 3.4,  
C.P. 37967, Comunidad de San Rafael, Doctor Mora,  
Guanajuato, México.  
Tel. +52 419 688 1191