Surgical Technique

Proven French innovation in orthopaedics

E.SPINE® TANIT®

Iliosacral fixation

SPINE - RACHIS

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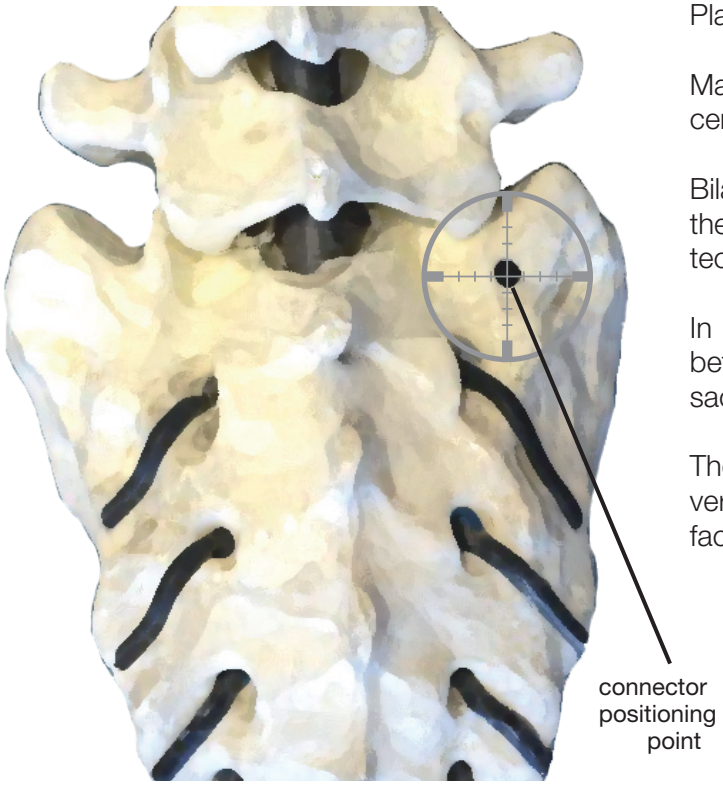
1. INTRODUCTION

The E.SPINE® TANIT® pelvic fixation system - composed of connectors and iliosacral screws - is intended for the extension to the pelvis of lumbar and thoracolumbar spinal osteosynthesis constructs, in adults and in children.

This bilateral fixation requires minimal space. It has been designed to be connected to the rest of the construct by means of titanium or cobalt chromium 5.5 mm diameter rods.

The special feature of this fixation system resides in the anchorage of the connector in the middle of the iliosacral screw, such that lever effects on the anchorage are limited compared to those generated by a fixation anchored at the end of the screw.

2. EXPOSURE AND ANATOMICAL LANDMARKS



Place the patient lying in prone position.

Make a medial posterior 8 to 10 cm-long incision, centered on a horizontal line that runs on the crests.

Bilateral sub-fascial undermining allows access to the lumbosacral joint using Wiltsee's transmuscular technique.

In a subperiosteal approach, clear the space between L5 lower facet joint and the first posterior sacral foramen.

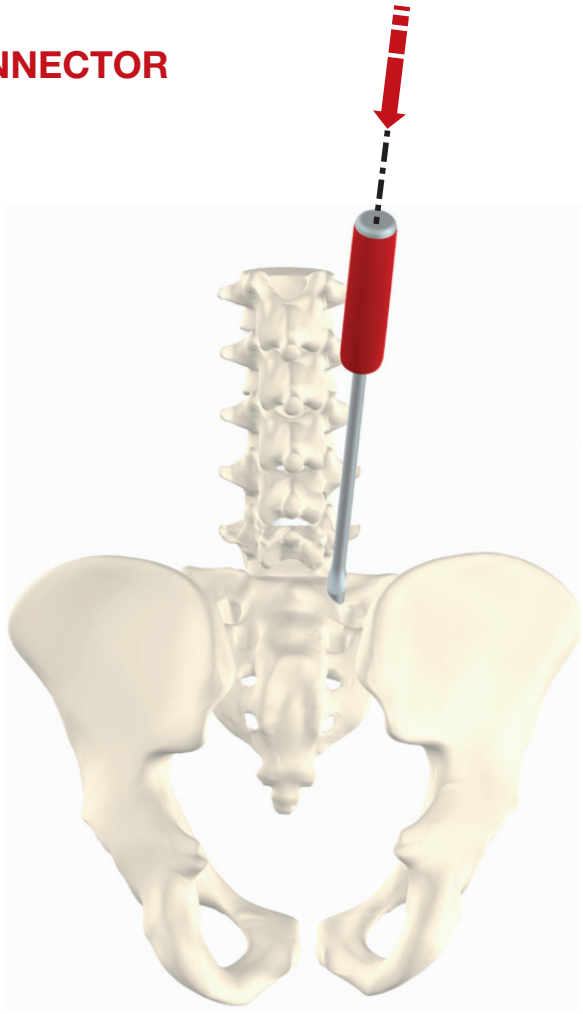
The connector positioning point is located on the vertical line that runs along the lateral rim of L5-S1 facet joint, just above the first sacral hole.

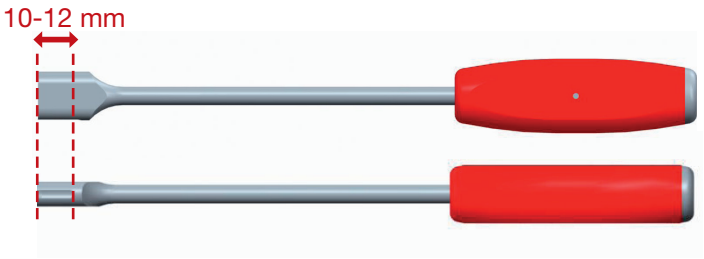
3. CREATING A RECESS FOR THE CONNECTOR

Insert the iliosacral osteotome perpendicular to the sacrum posterior surface and parallel with the spinous process line to create a recess.

Impact the osteotome to traverse the sacrum upper cortical wall and penetrate into the sacrum to a depth of 10 to 12 mm.

Make a slight pivotal movement with the osteotome along the sagittal plane to remove delicately the piece of bone cut from the sacrum.





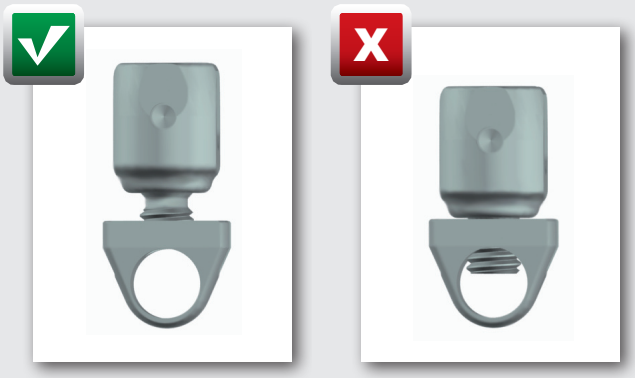
4. POSITIONING THE CONNECTOR

IMPORTANT

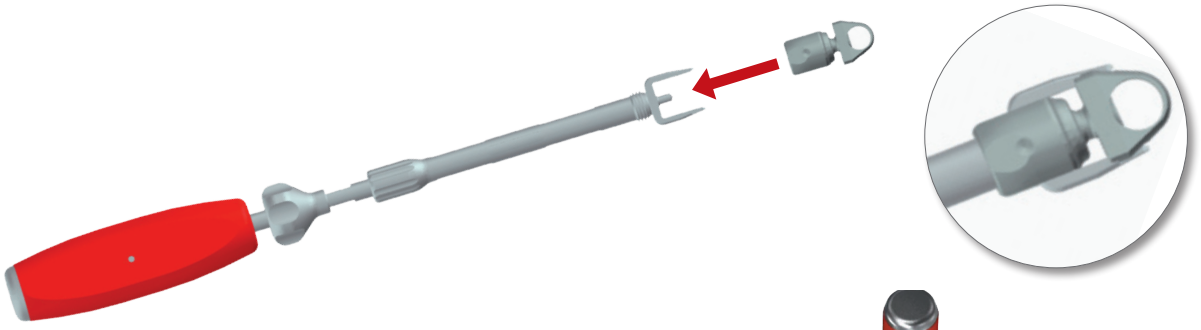
The connector is supplied with a calibration made during the assembling, intended to ensure that the iliosacral screw passes through the connector ring.

Before the implantation, it is recommended to check the setting of the screw which should allow the iliosacral screw to slide freely within the connector ring.

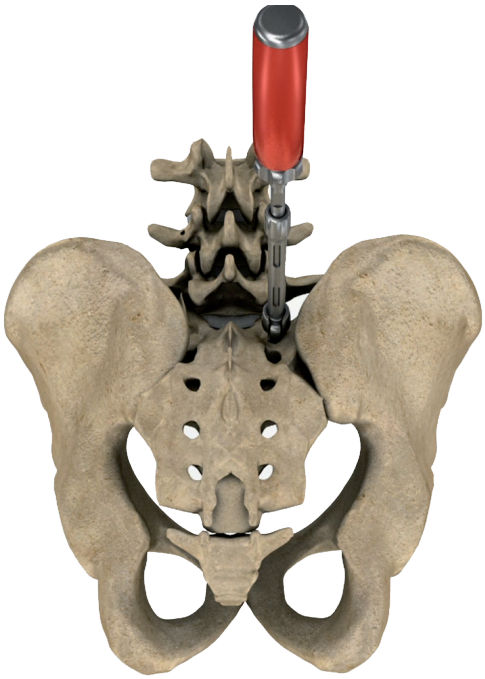
If necessary, adjust the position of the assembling screw using a screwdriver.



Assemble the connector on the implant holder. The latter shall also be used as a support for a specific targeting device.

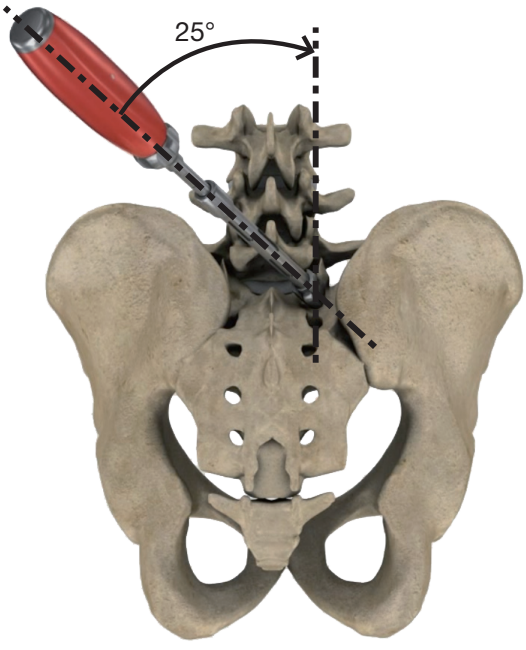


Then introduce the implant inside the recess to the point when the flared portion comes into contact with the sacrum posterior cortical wall.



Tilt the implant holder over approximately 25° towards the medial line, to provide the future iliosacral screw with a level of obliquity that will allow it to pass forwards from the canal.

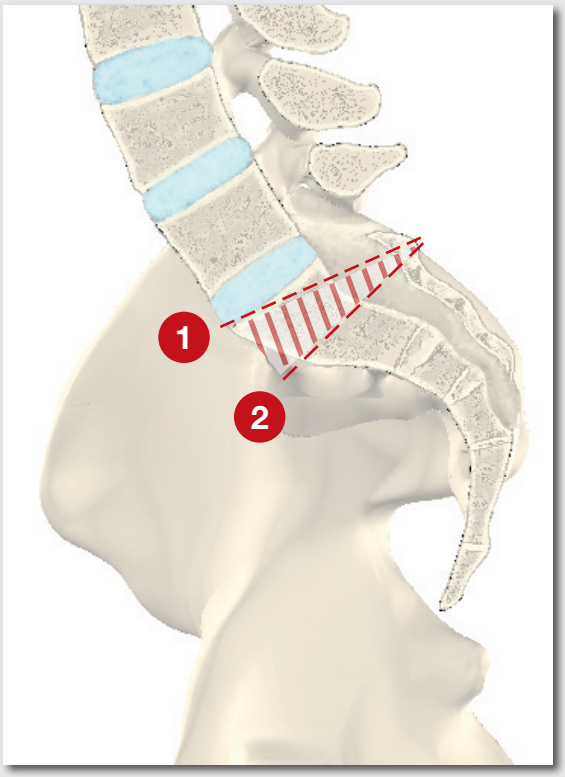
Through a neutral rotation of the implant holder handle relative to the medial line, it is possible to maintain the direction of the iliosacral screw parallel with the sacral plate.

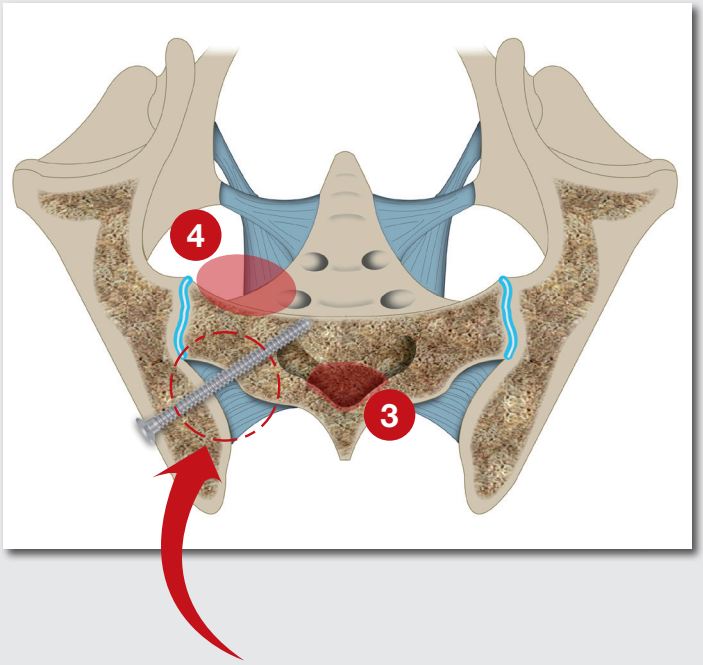


5. ILIOSACRAL SCREW ORIENTATION

IMPORTANT

1. **Over ascending screw :**
Risk of impingement with the disc L5-S1
2. **Over descending screw :**
Risk of impingement with S1 root
3. **Over-posterior screw:**
Risk of impingement with the canal
4. **Over-anterior screw:**
Risk of impingement with vessels





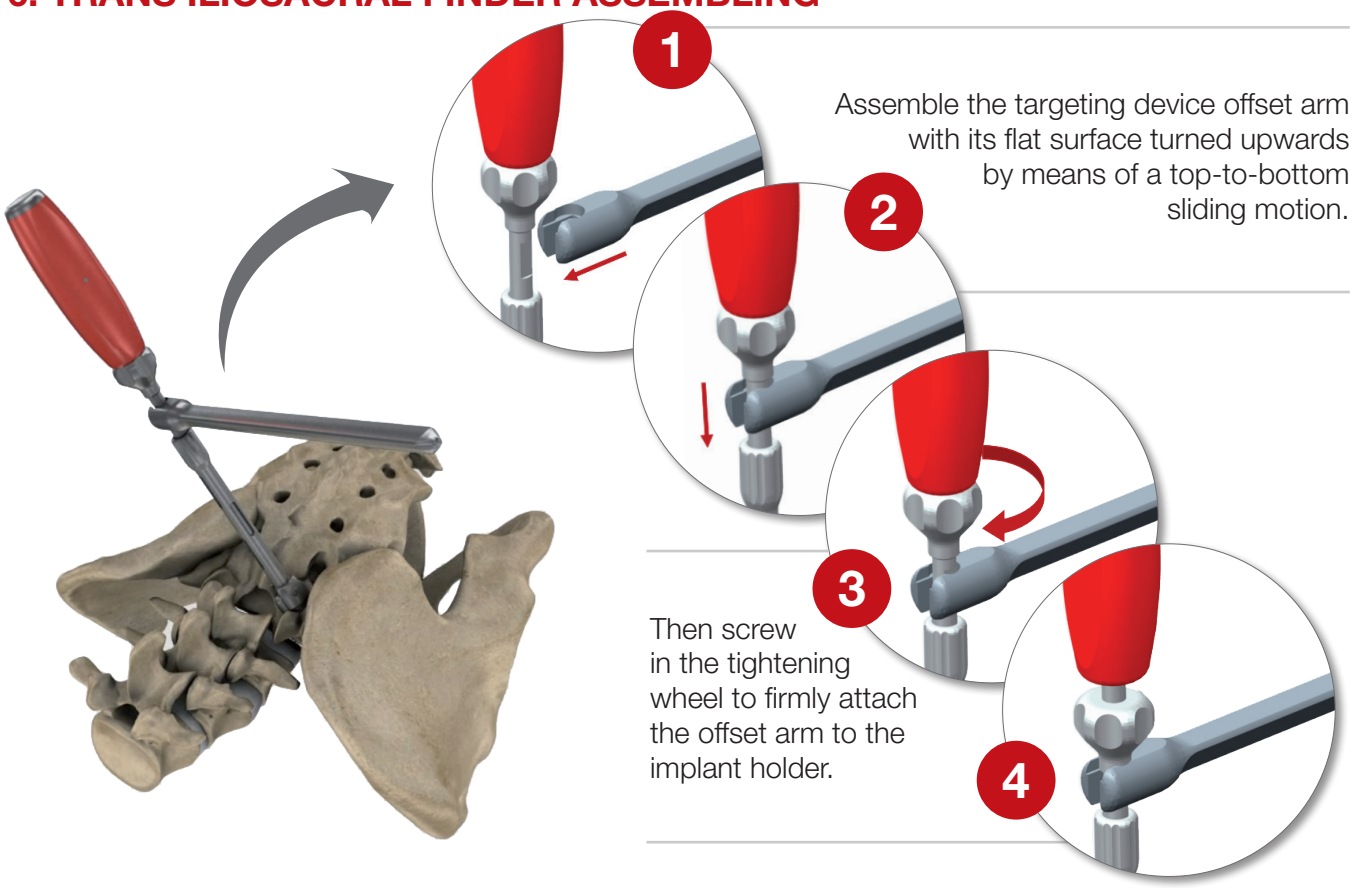
The screw trajectory and positioning enable the sacroiliac facet joint to be respected.

ATTENTION

In some cases where the iliac wings are poorly developed posteriorly, the screw entry point may be located just above the iliac crest without passing through the bone; this would make the fixation unstable.

For optimal targeting safety, proceed with pre-operative planning or per-operative fluoroscopic monitoring.

6. TRANS ILIOSACRAL FINDER ASSEMBLING

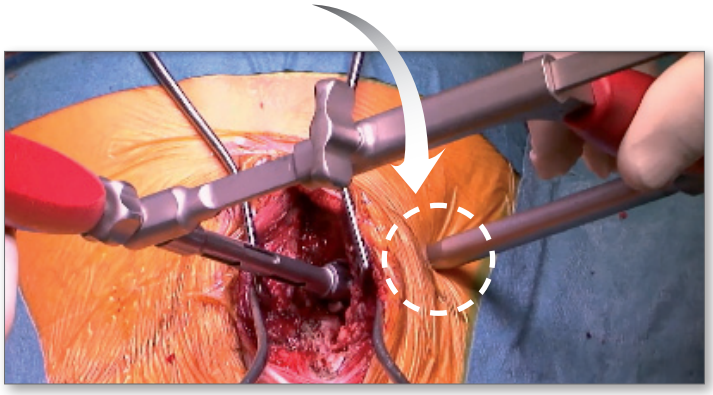


Assemble the targeting device offset arm with its flat surface turned upwards by means of a top-to-bottom sliding motion.

Then screw in the tightening wheel to firmly attach the offset arm to the implant holder.

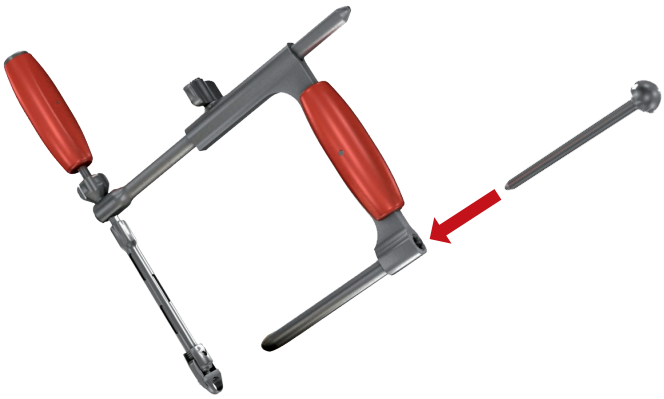
Then insert the body of the trans-iliosacral targeting device by sliding along the offset arm.

The guiding tube sets the screw trajectory and its entry point by making a contact mark on the skin.
Make a 10 to 12 mm horizontal incision on the mark.



IMPORTANT

The mark is made by the guiding tube **without the bougie** which is to be introduced in the next step.
It is essential to preserve the position of the implant holder throughout the operation.

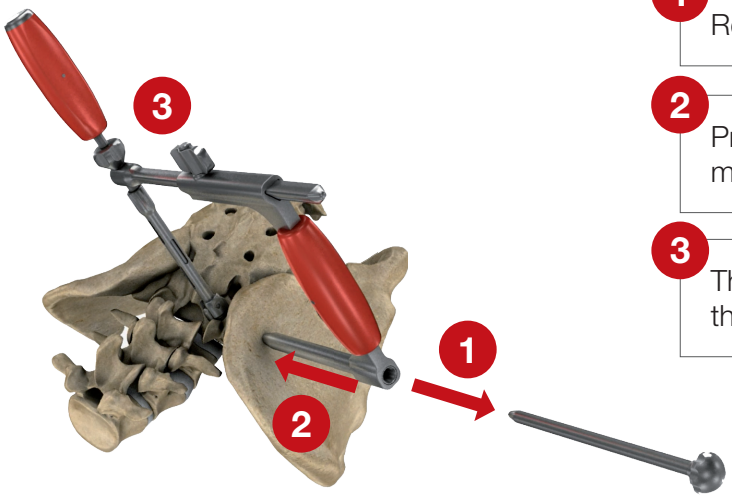


Insert and then screw the bougie in the guiding tube. Then move the bougie through the soft tissues until it comes into contact with the iliac wing.

It is advisable to slightly impact the bougie with a hammer to come into contact with the bone.

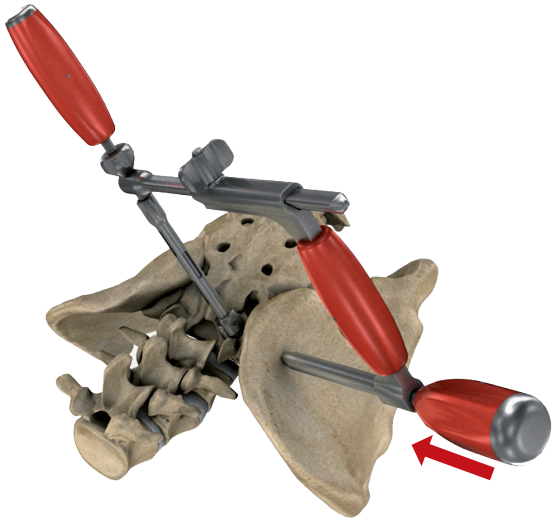
If possible, it is recommended to prepare the trajectory through the soft tissues using a Kelly clamp.

At this stage, you must ascertain that there is contact between the end of the guiding tube and the iliac wing surface.



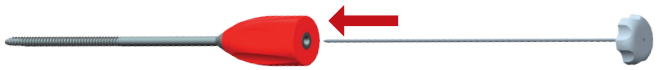
1. Remove the bougie.
2. Press the guiding tube against the iliac crest, by means of a hammer.
3. Then tighten the tightening screw to lock fully the targeting device.

7. PREPARATION OF THE ILIOSACRAL SCREW PATH

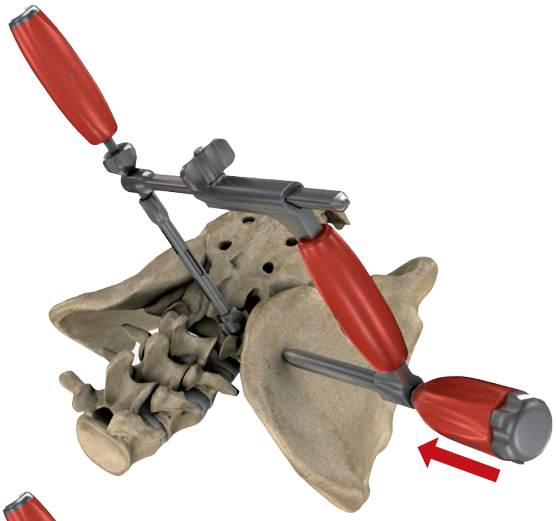


Prepare the path of the screw through the bone using an awl, from the iliac wing to the body of S1, passing through the connector.

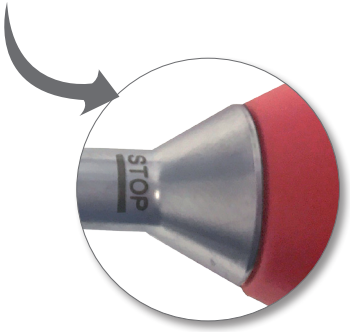
Fluoroscopic control can be made with the awl in position.

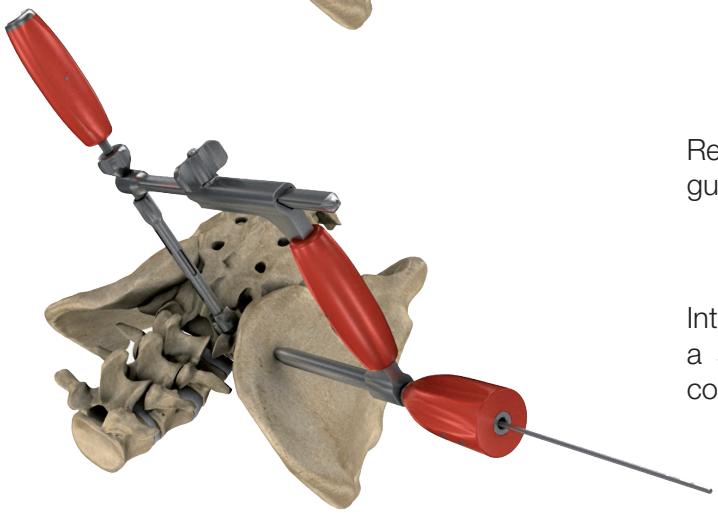


Assemble the pin with plate to the cannulated tap.



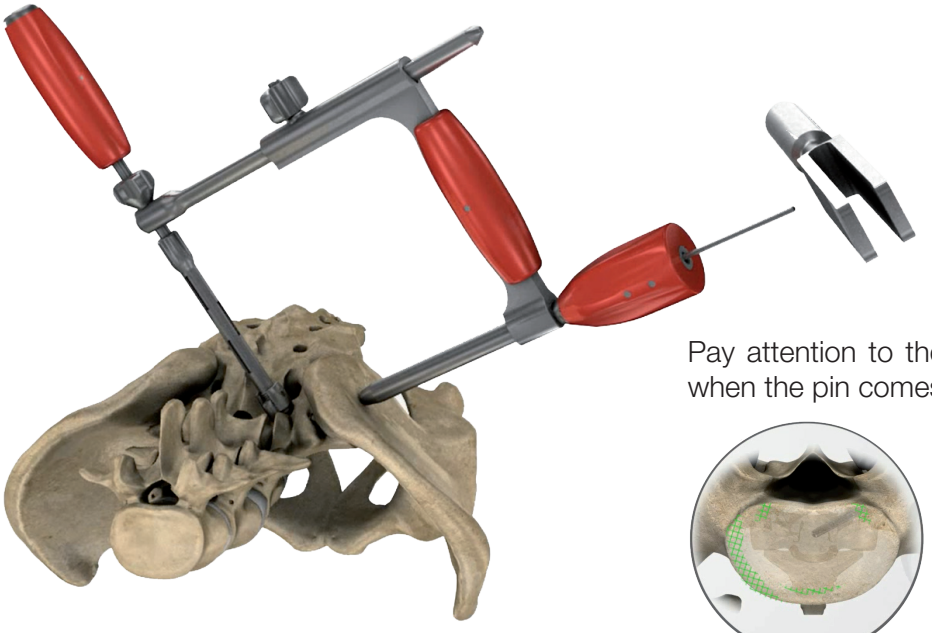
The cannulated tap-plate pin assembly is then screwed in up to the **STOP** mark on the tap shaft.



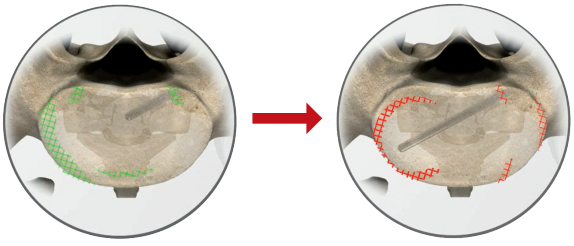


Remove the pin with plate and replace it with a pin guide with blunt ends.

Introduce it into the bone by tapping it gently using a slotted hammer, until its distal end comes into contact with S1 opposite anterolateral cortical wall.

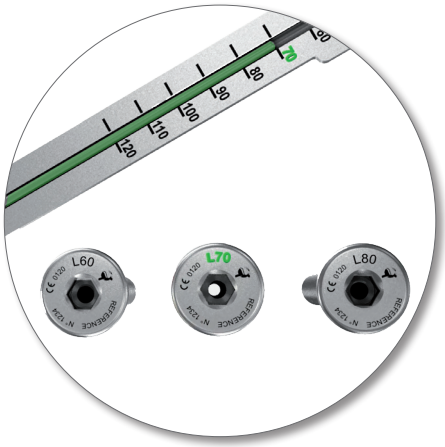


Pay attention to the change of the hammer sound when the pin comes into contact with the bone :

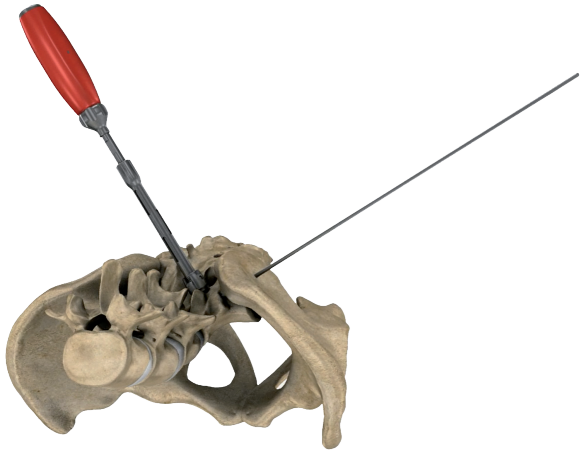


Then remove the tap while holding the pin in position.

Place the graduated gauge at the targeting device opening to measure the length of the screw to be inserted.



8. REMOVING THE TRANS ILIOSACRAL FINDER AND INSERTING THE SCREW

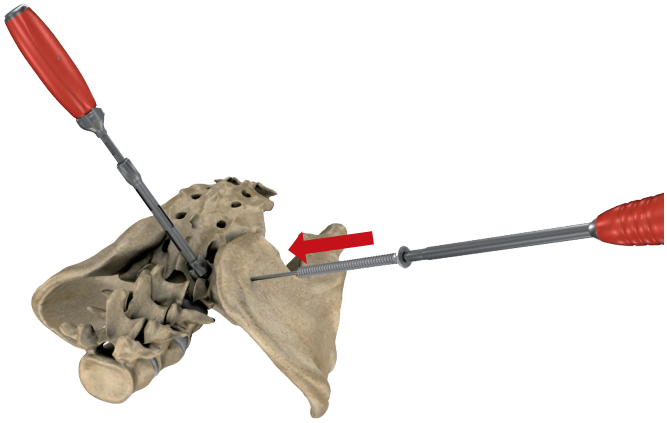


Remove the offset arm from the implant holder.

Make sure that the pin is held in position.

IMPORTANT

Apply a slight upward traction to the handle of the implant holder to ascertain the proper passage of the pin inside the connector ring.



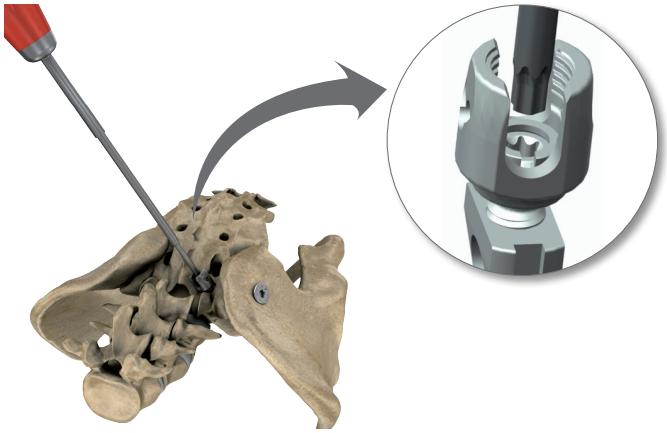
Insert the cannulated screw fitted on the cannulated screwdriver along the pin.

It passes through the connector and takes position into the sacrum.

Tighten the screw until the countersunk head comes into contact with the iliac wing lateral cortical wall.

Check the head-bone contact using a small clamp slid along the screwdriver still in position, to assess the screw head-to-bone distance.

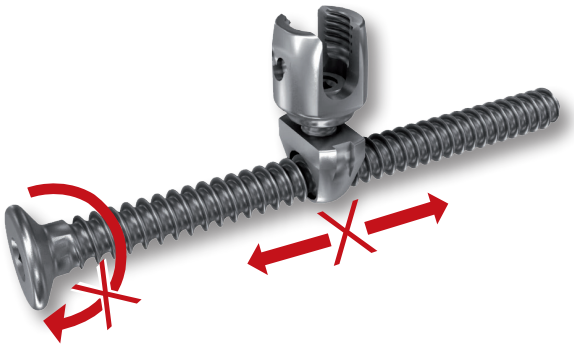
9. ILIOSACRAL SCREW LOCKING



Remove the pin and the implant holder to tighten the locking screw located at the bottom of the connector; this solidly attaches the latter to the iliosacral screw while preserving its polyaxial orientation.

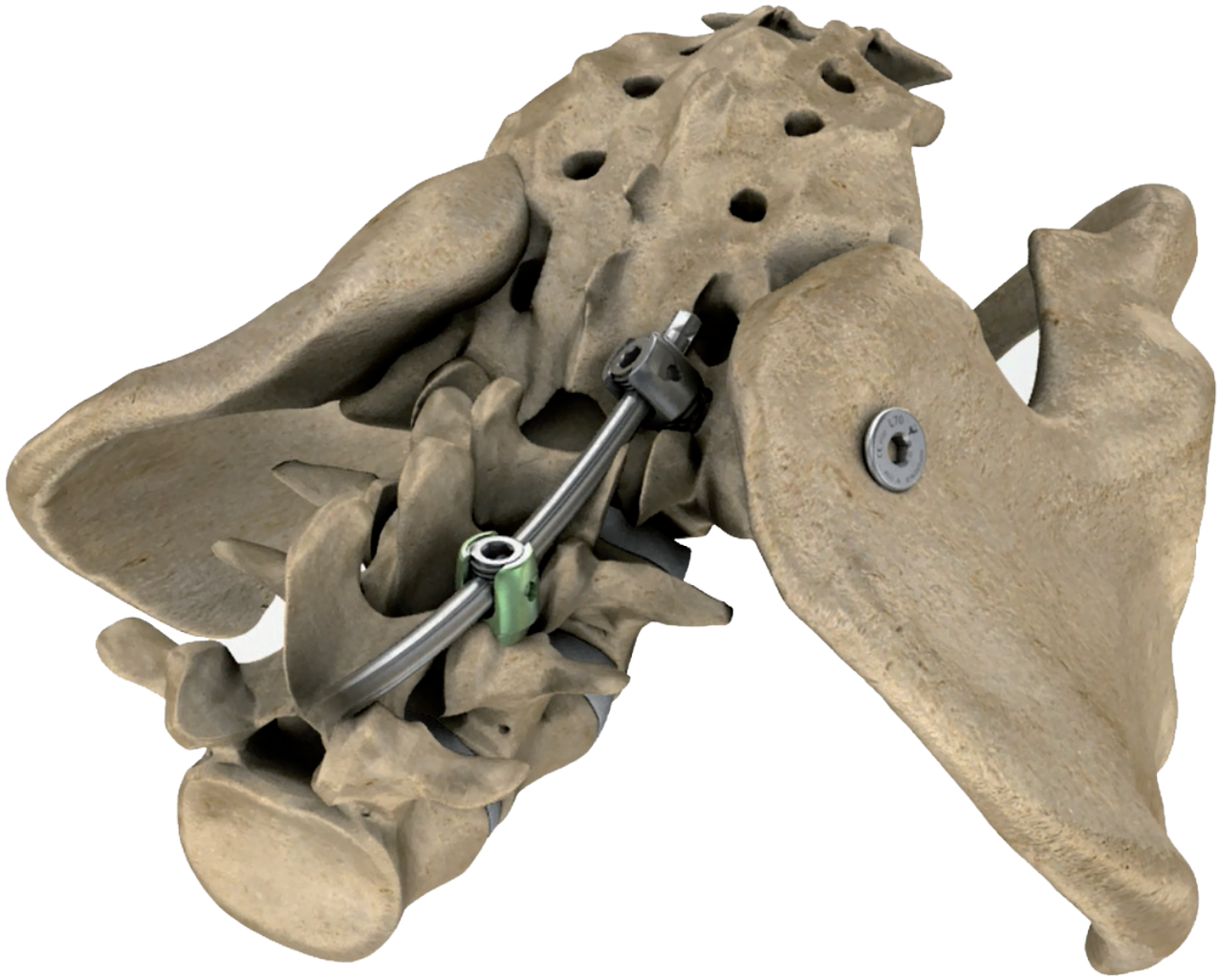
Screw-connector attachment

The connector lock screw maintains the iliosacral screw



Once locked, the screw can neither turn nor slide in the connector.

10. ROD INSTALLATION



Then install the other spinal implants.

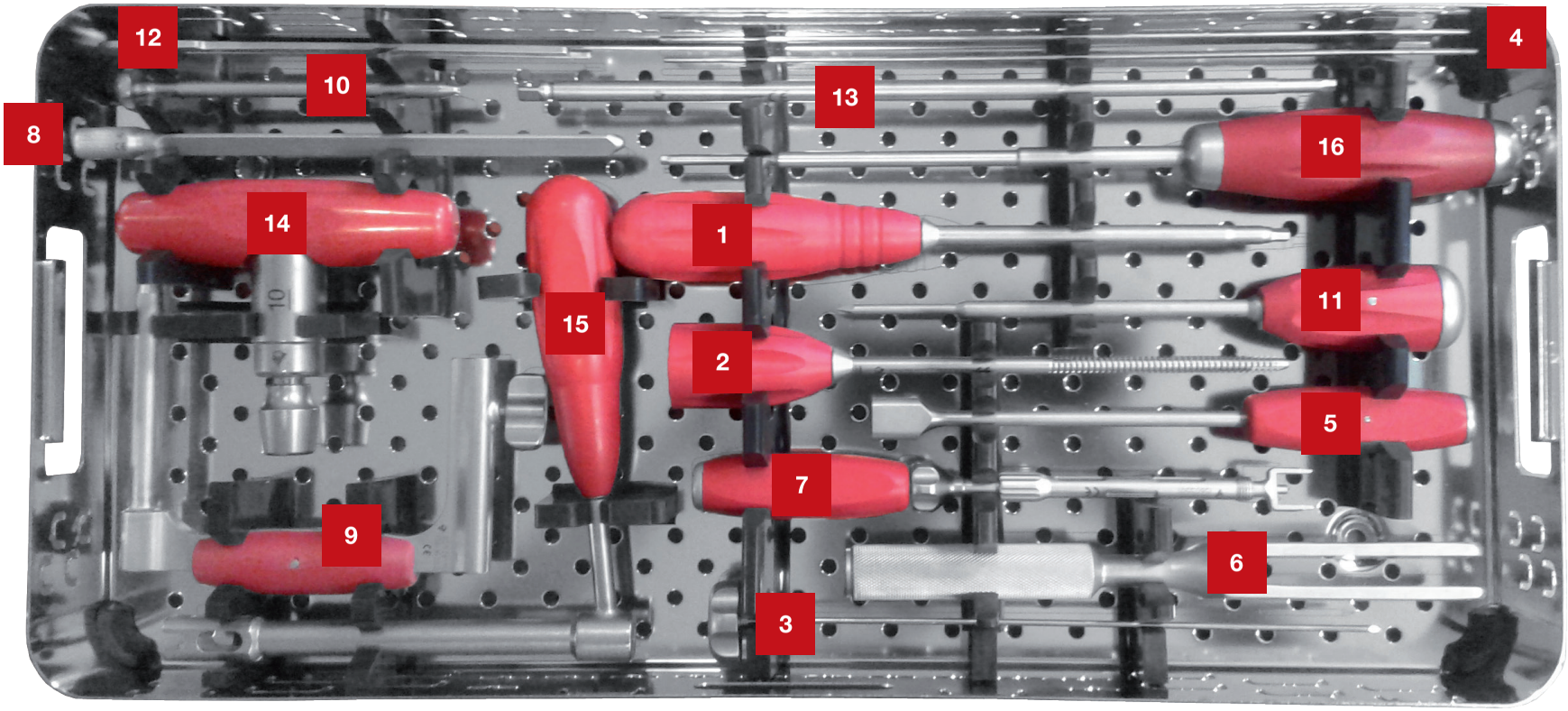
Install the rod in the connector and the rest of the implants, then secure it using the locking screw, by means of the 10 Nm torque wrench once you have completed the compression or distraction necessary to correct the deformity.

For additional information on the utilization of the E.SPINE® implants, see the corresponding surgical technique documentation.

INSTRUMENT SET

E.SPINE® TANIT®

Instrument set 1.E-SPINE-TIS



N°	Reference		Instrument
1	B2526011		Cannulated screwdriver hexagonal 4,5 mm
2	B2526021		Trans iliosacral cannulated tap
3	B2526031		Pin with plate
4	B2526041		April pin Ø 2,5 mm
5	B2526061		Iliosacral osteotome
6	B2526071	or	Slotted hammer
6	M02190	or	Slotted hammer
7	B2526111		Iliosacral connector holder
8	B2526121		Runner

N°	Reference		Instrument
9	B2526131		Trans iliosacral finder
10	B2526141		Bougie
11	B2526151		Iliosacral square awl
12	B2526161		Graduated gauge
13	B2522031		Locking screwdriver
14	G04ITM084-10	or	Dynamometric T handle
14	B2524052	or	Dynamometric T handle
15	B2522051		Counter torque
16	B2522021		T20 screwdriver

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