



APOLLON™

The Best MISS Solution

It took more than 8 years for solco to design and test this newly developed MISS solution, APOLLON. Now, test this clinically proven APOLLON. It's simply the best MISS.



SOLCO.
LIFE & SCIENCE

Why Apollon?

The rimmed screw

that ensures ultimate tightening without distortion.

The threaded pivot joint of the screw

that realizes secure fixation at intended angle.

Direct rod insertion mechanism

that simplifies the process.

that allows surgeons to make rod insertion easier.

Alignment guide

that makes both screw heads in parallel and helps the rod be inserted easily.

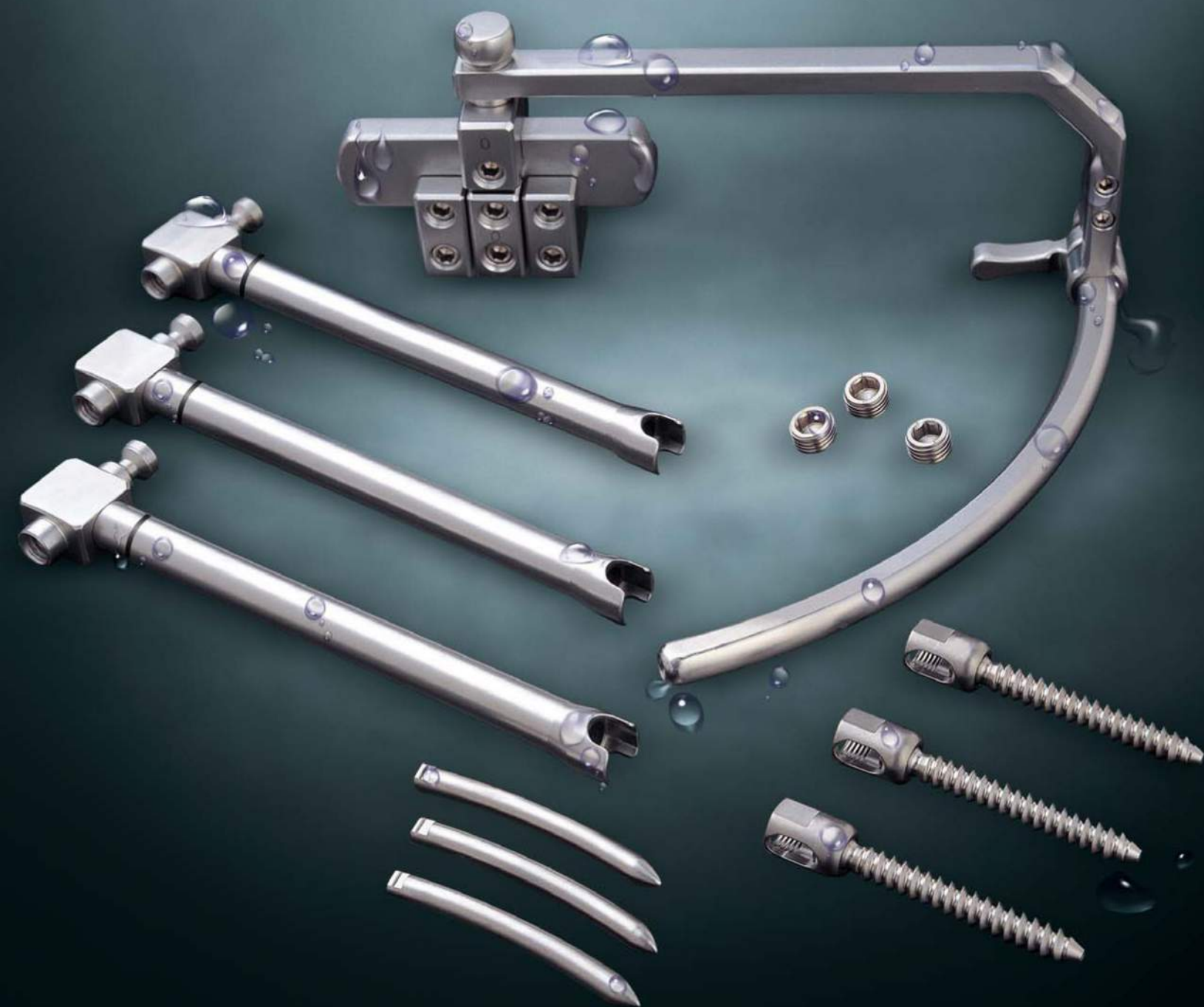


Table of CONTENTS

INDICATIONS & CONTRAINDICATIONS	04
FEATURES & BENEFITS	04
SURGICAL TECHNIQUES	05
Fluoroscopic planning of incision points	06
Placing the VP Needle	07
Placing the Guide wire	08
Soft tissue dilatation	09
Tapping the pedicle pathway	09
Pedicle screw extender assembly	10
Placing the pedicle screw	11
Rod insertion assembly	12
Rod assembly	13
Rod insertion	14
Nut tightening	15
Final tightening and remove	16
Assembly removal	16
CASE STUDIES	17
Preoperation & Postoperation	18
PRODUCT INFORMATION	21
Implants Specifications	22
Instruments Specifications	23

INDICATIONS & CONTRAINDICATIONS

Indications

- Transforaminal Lumbar Interbody Fusion (T.L.I.F)
- Mini open Posterior Lumbar Interbody Fusion (P.L.I.F)
- Posterior stabilization that follows after mini-open Anterior Lumbar Interbody Fusion (A.L.I.F)
- Transient posterior stabilization on compression fracture of spine.
- Scoliotic, lordotic, or kyphotic deformities
- Degenerative disc disease
- Fractured dislocation of the posterior thoracolumbar spine.
- Spondylolisthesis : grade I, II
- Spinal disorders : (HNP+stenosis)
 - ▶ 60%~70% (This is round figure based on surgeries in Korea)
- HIVD
 - ▶ 20%~30%
- Chronic back pain.

Contraindications

- Malalignment
- Severe spinal deformity such as Kyphosis and Scoliosis
- Infection condition

FEATURES & BENEFITS

Features & Benefits

- Minimal complication rate.
- Reduced surgical blood loss.
- Short operation time.
- Minimal postoperative pain.
- Minimal postoperative paraspinal muscle fibrosis rate.
- Decreased trauma to soft tissue during spine fusions.
- Minimal operation scar.
- Avoidance of fusion disease.
- Shorter hospital stays.
- Quicker return to normal activity

Apollon TOUR



- **Threaded screw joint**
 - ▶ Firm and secure fixation



- **One-touch rod locking system**
 - ▶ Easy & quick operation



- **Unique alignment guide**
 - ▶ Easy rod insertion



- **Rimmed screw head**
 - ▶ No risk of screw head loosening



SURGICAL TECHNIQUE

Fluoroscopic planning of incision points

Placing the VP Needle

Placing the Guide wire

Soft tissue dilatation

Tapping the pedicle pathway

Pedicle screw extender assembly

Placing the pedicle screw

Rod inserter assembly

Rod assembly

Rod insertion

Nut tightening

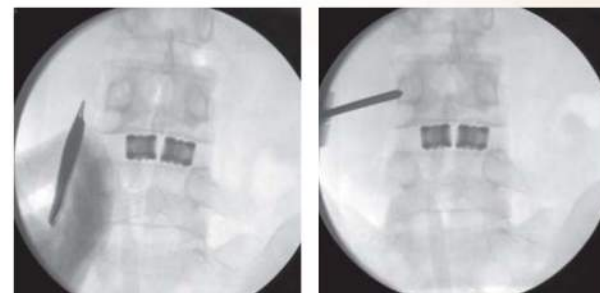
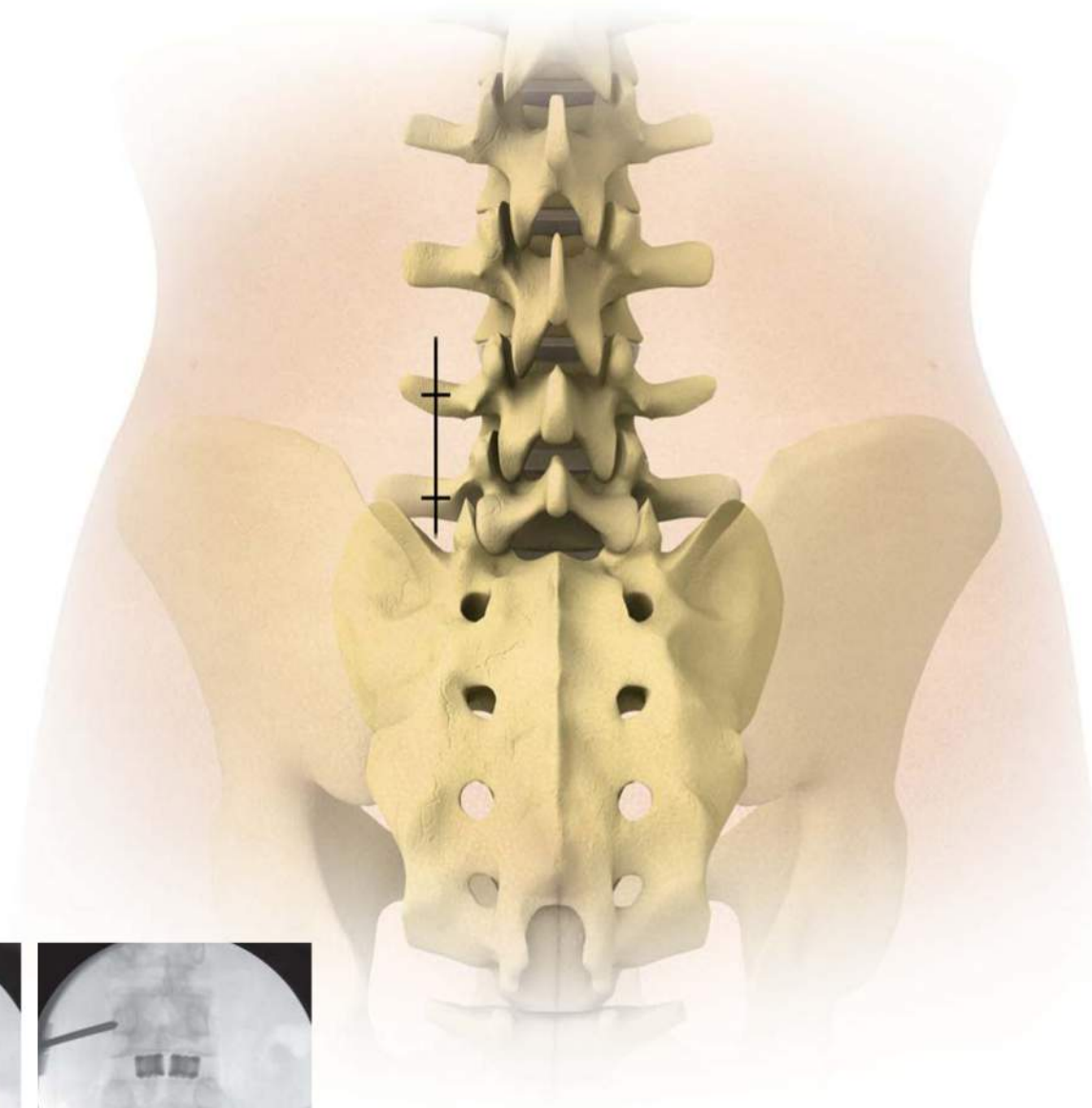
Final tightening and remove

Assembly removal

1. Fluoroscopic planning of incision points

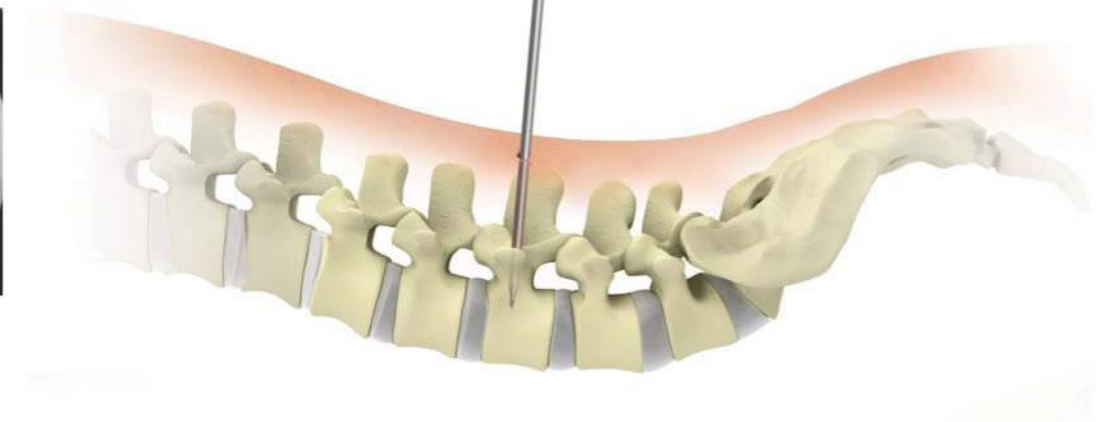
To determine the incision point, identify the entry point of the pedicle, which is at the intersection of the superior facet and the transverse process, with the fluoroscopic imaging of the C-arm on AP view.

The incision point is located at 1cm lateral or more depending on patient size to the targeted pedicle entry point. This is to achieve an ideal guide path for the Pedicle Screw by considering muscles and the depth from the skin to the pedicle entry point. Mark the incision point using a marker.



2. Placing the VP Needle

Make 1.3cm transverse incision (relatively to the VP needle size) and advance the VP needle to the pedicle entry point with about 15-degree-slant medial. The VP needle should be paralleled to the superior endplate of the vertebra on lateral view. Monitor that the VP needle is seen at the posterior margin of the vertebral body on lateral view. Advance the VP needle just as much it perforates into the vertebral body while confirming the direction with C-arm on lateral view. Extra caution is required to avoid excessive advance.



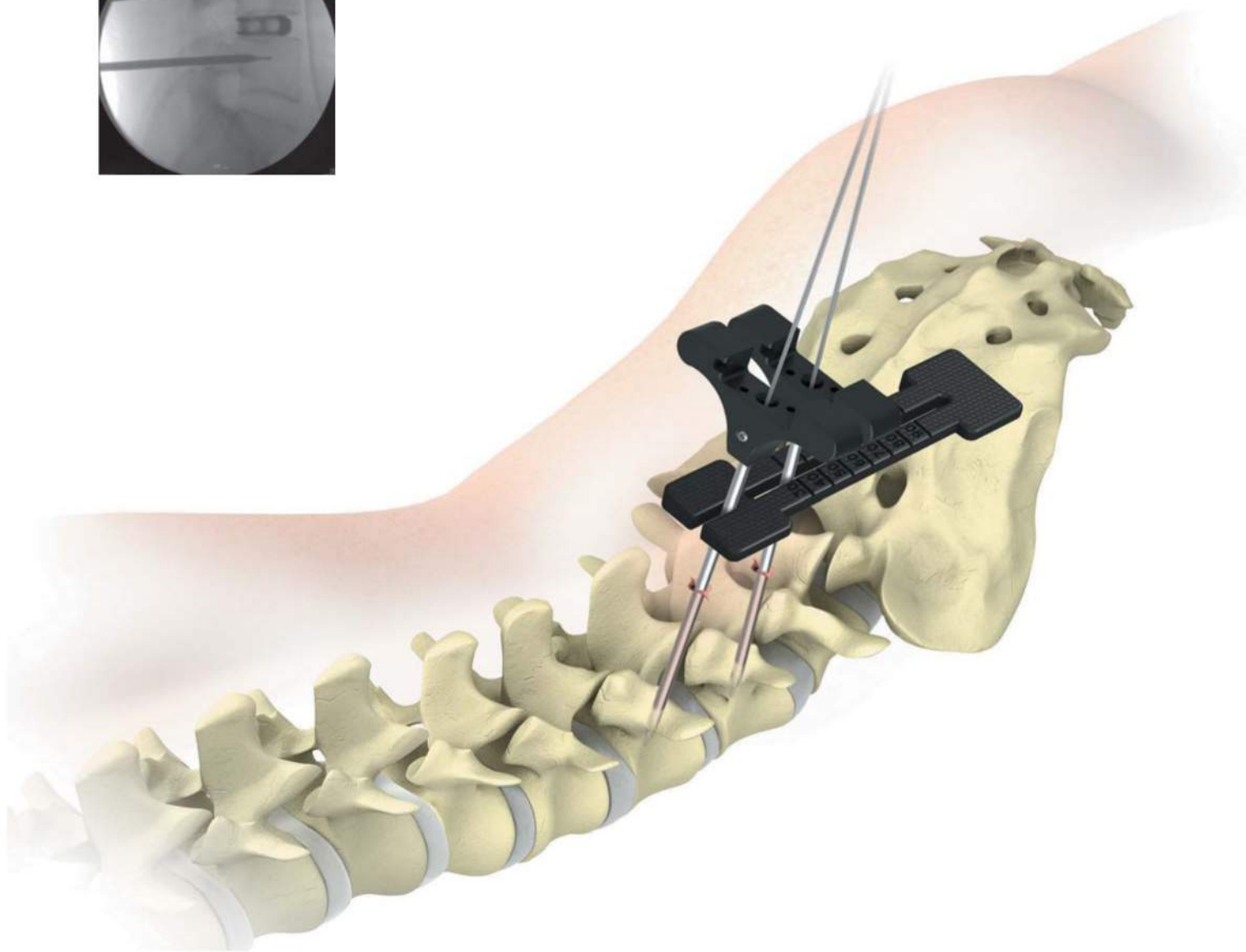
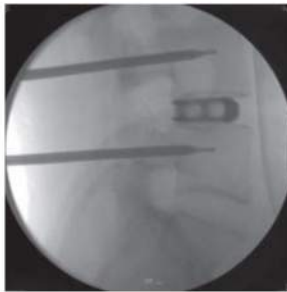
After the first insertion of the VP needle, place the open end of the Alignment Guide (Cat No. 4901-3016) around it. The second VP needle is inserted into the slot of Alignment Guide. If the case is more than 1-level, the third one can be inserted in a row. In this way, the following VP needle is inserted as the first one. It aligns the side slots of the Pedicle Screw and ultimately enables the Rod insertion to be smoother.



3. Placing the Guide Wire

Remove the inner stylet of the VP needle and insert the Guide Wire into the VP needle with caution. Unintentional advancement can cause unexpected result, so the placement of the Guide Wire should be performed very carefully.

Once the Guide Wire is well placed, remove the VP needle carefully while securing the Guide Wire.

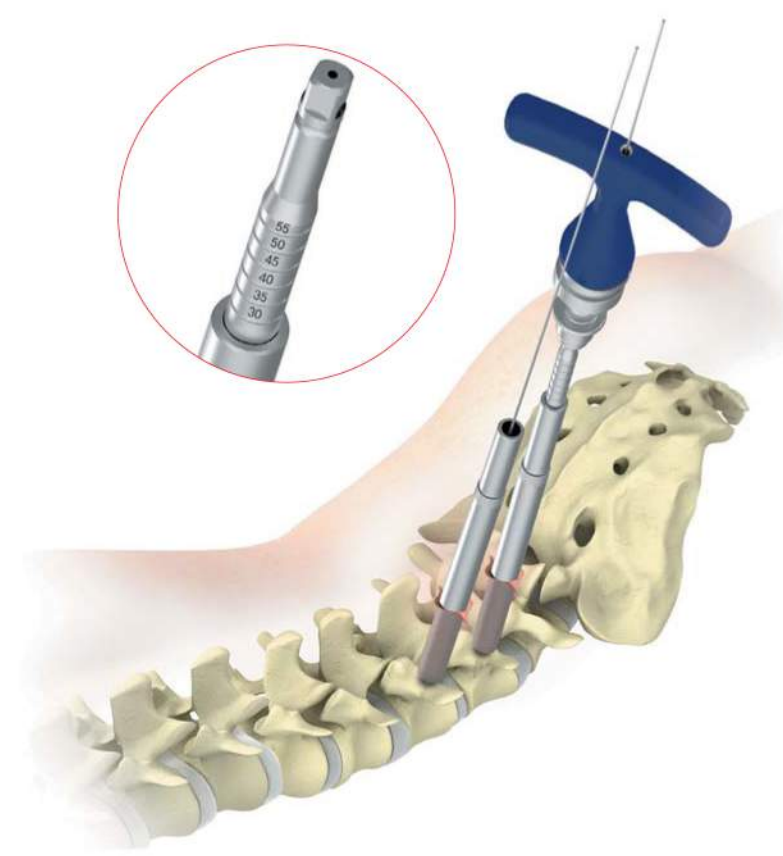
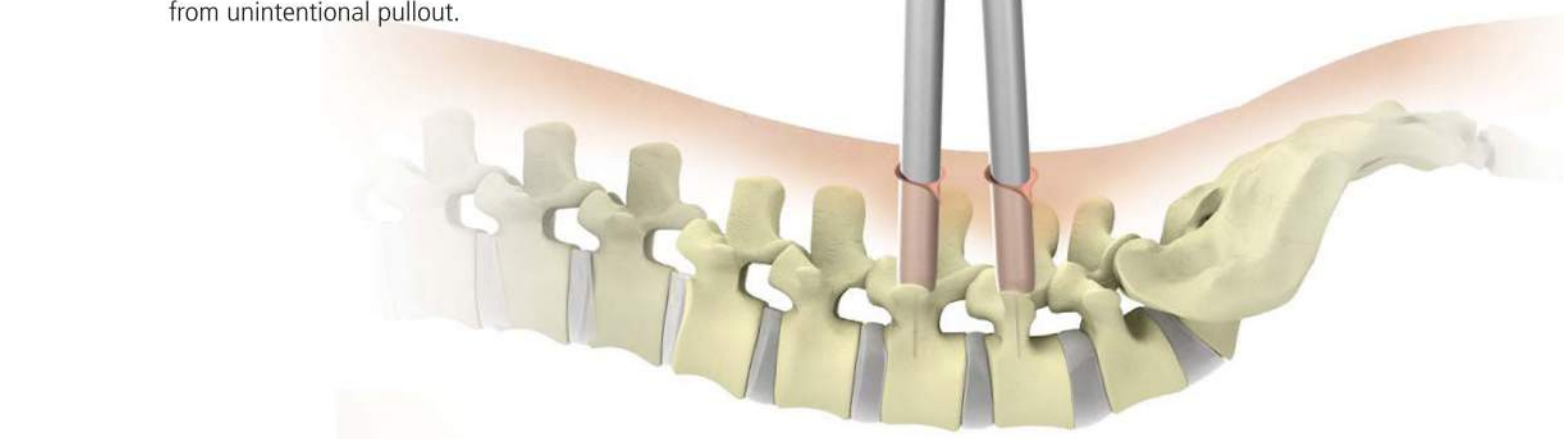


4. Soft tissue dilatation

Make transverse skin incision 1.3cm centering on the Guide Wire. Advance the 4 different size of Dilators sequentially from smaller to larger one down to the bony surface. This procedure is to make enough room for the following screw insertion.

- The 4th Dilator (the largest one) can be omitted if minimal skin incision is wanted.

Retain the outermost Dilator in place and remove other Dilators. Be sure to secure the Guide Wire from unintentional pullout.



Tapping the pedicle pathway

After assemble the Apollon Cannula Tap with T-handle or T-Ratchet handle or I-Ratchet handle, Slide down over the guide wire and advance it up to the first quarter of the vertebral body.

Graduation markings on the shaft of the Tap can be used to determine the depth of the tap and also for selecting the appropriate length of pedicle screw.

While tapping, lateral imaging is taken to ensure the guide wire from any further advancement anteriorly. Repeat the same step for the adjacent pedicle. Remove the Tapper carefully and look out any unintentional withdrawal of the Guide Wire.

5. Pedicle screw extender assembly

Determine the proper sized Pedicle Screw and assemble it to screw Holder set securely.

The Screw Holder set is constituted by 3 devices as shown below.

- 1) Attach the Pedicle Screw to the Outer Holder. Place the flat sides of the screw head to fit into the distal end of the Outer Holder.
- 2) Slide the Inner Holder down to the screw head through the sleeve of the Outer Holder. As the tip of the Inner Holder meets the screw threads, engage the both threads by turning clockwise. Yet this Poly-Axial Pedicle Screw is still freely rotating

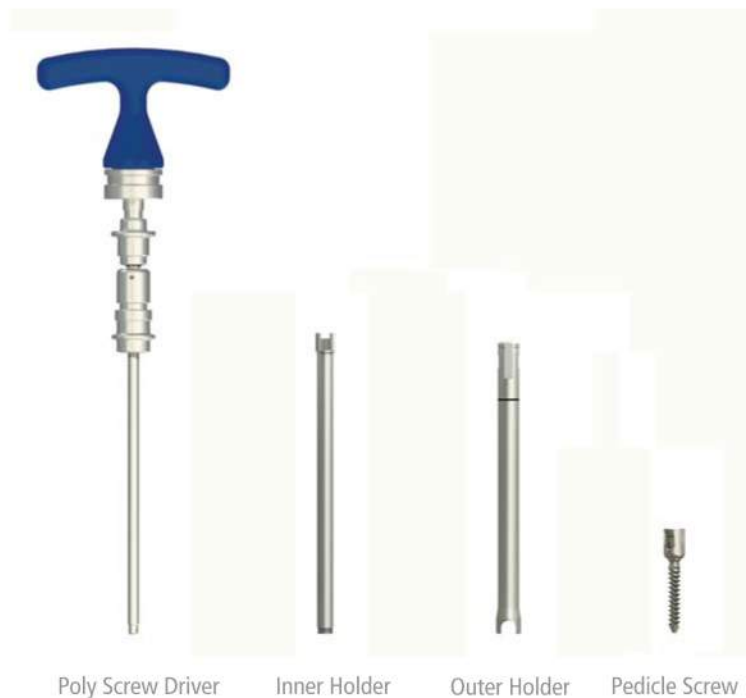
* Caution : Inner holder and Pedicle screw head should be combined by hand because excessive force, using small T-wrench, can be the cause of breakage of inner holder thread

- 3) Make sure that the Inner Holder and the Pedicle Screw are securely engaged against each other.

Tip : Use the Holder Clamp for an easy and solid lockup.

- 4) Assemble the Pedicle Screw with the Poly Screw Driver. Slide the Poly Screw Driver down to the Pedicle Screw head and engage the distal end of the driver with the Pedicle Screw.

Confirm that the Pedicle Screw assembly is solidly assembled. Now, advance the assembled screw set over the Guide Wire.

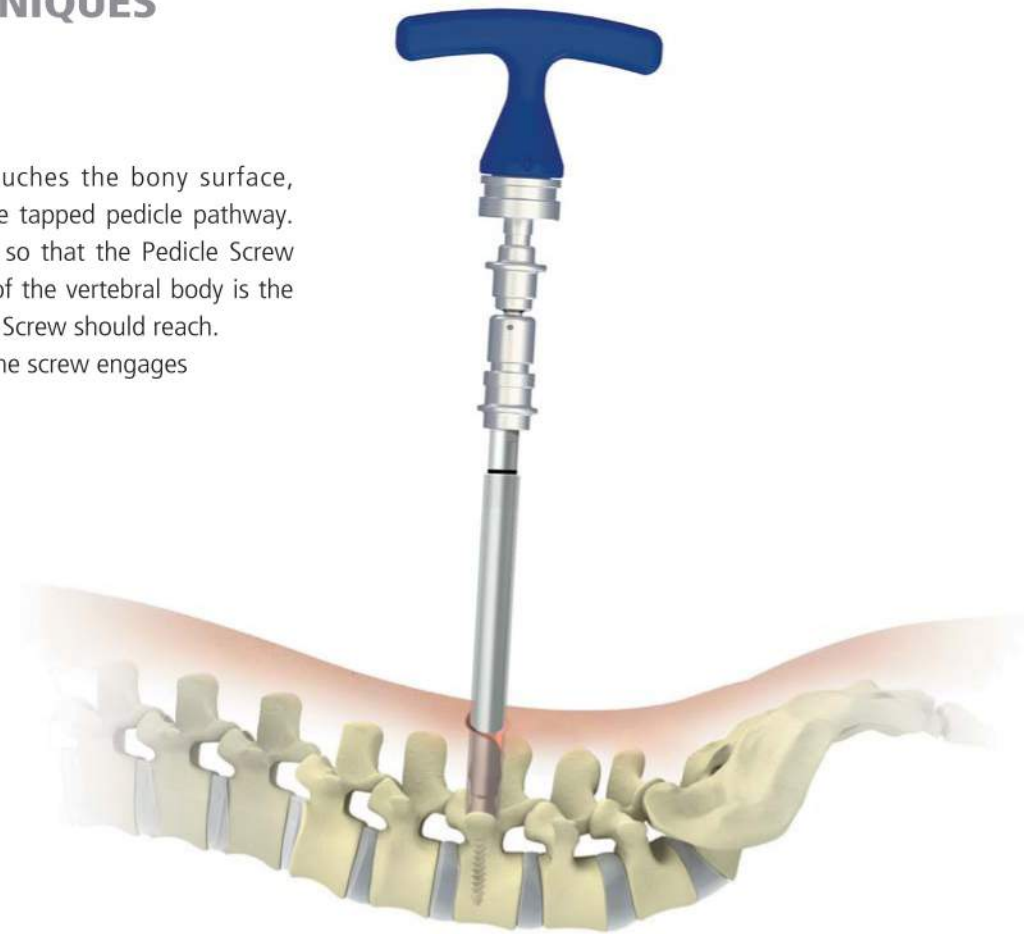
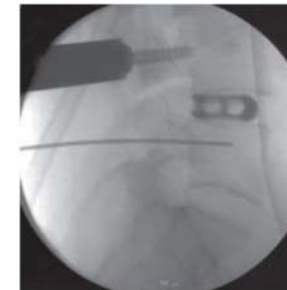


Poly Screw Driver Inner Holder Outer Holder Pedicle Screw

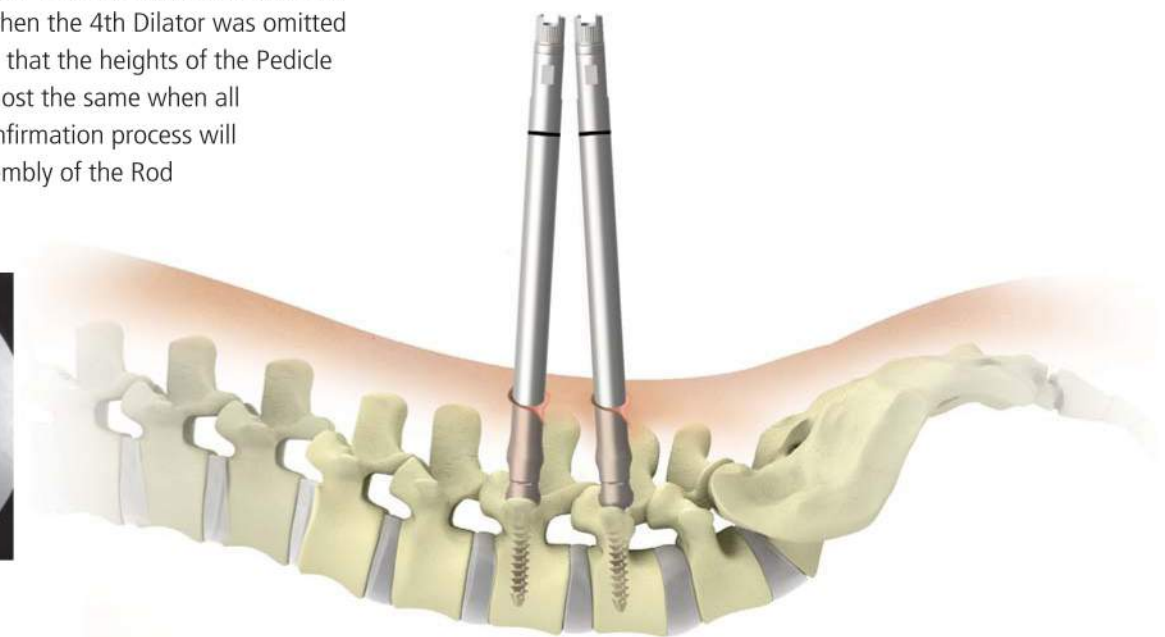
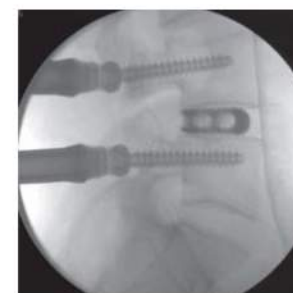


6. Placing the pedicle screw

Once the assembled screw set touches the bony surface, advance it into the pedicle along the tapped pedicle pathway. Monitor with C-arm on lateral view so that the Pedicle Screw shouldn't go too far. The 3/4 point of the vertebral body is the ideal depth that the tip of the Pedicle Screw should reach. The Guide Wire may be removed as the screw engages the bony surface.

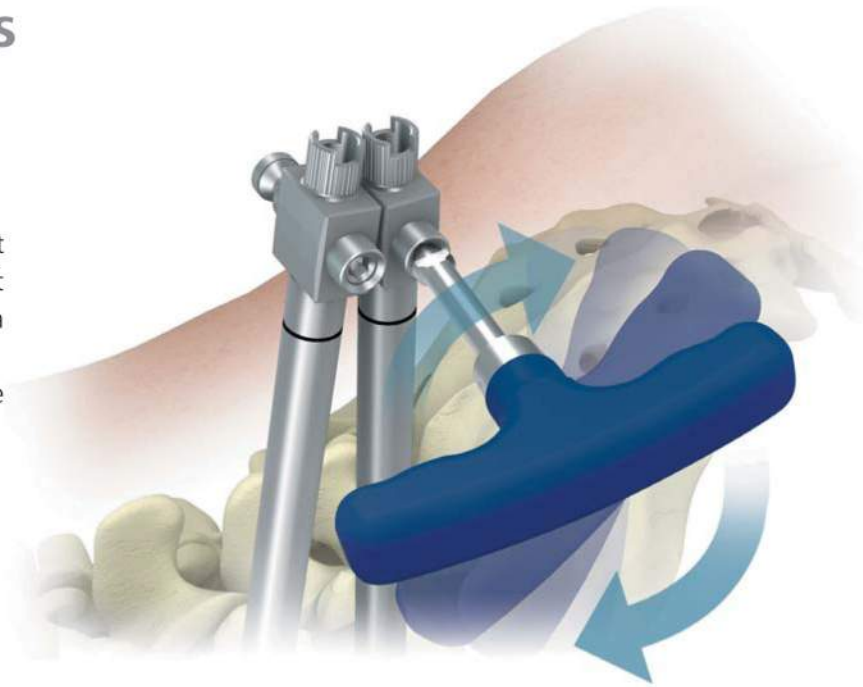


After the Pedicle Screw insertion, pull out the Poly Screw Driver from the assembly set and remove. The Dilator is also removed and only the screw with the screw extension set remains. (skip this step when the 4th Dilator was omitted in the first place) Confirm that the heights of the Pedicle Screw assemblies are almost the same when all insertion is done. This confirmation process will enable the following assembly of the Rod Insertion Set properly.

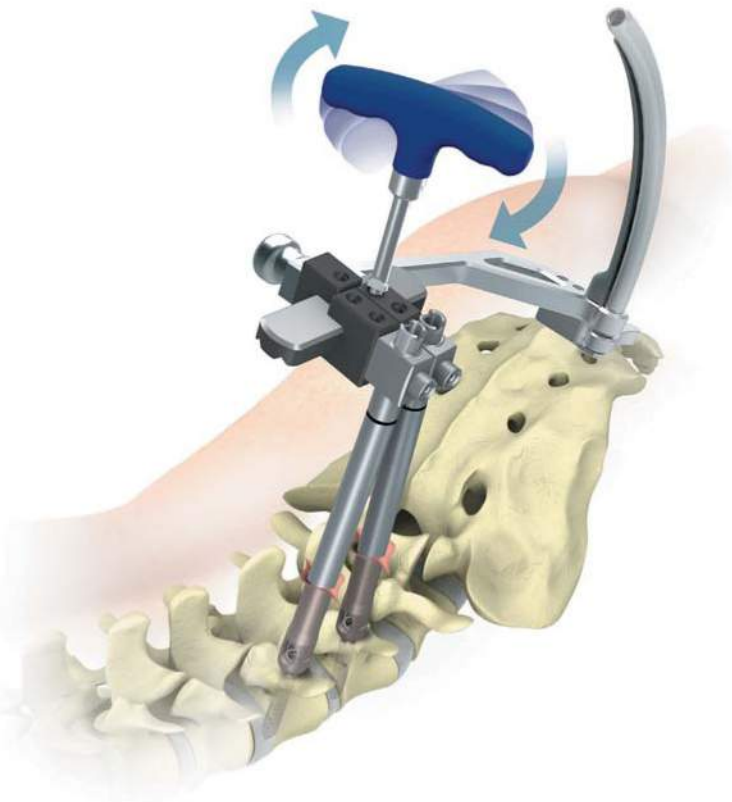


7. Rod insertion assembly

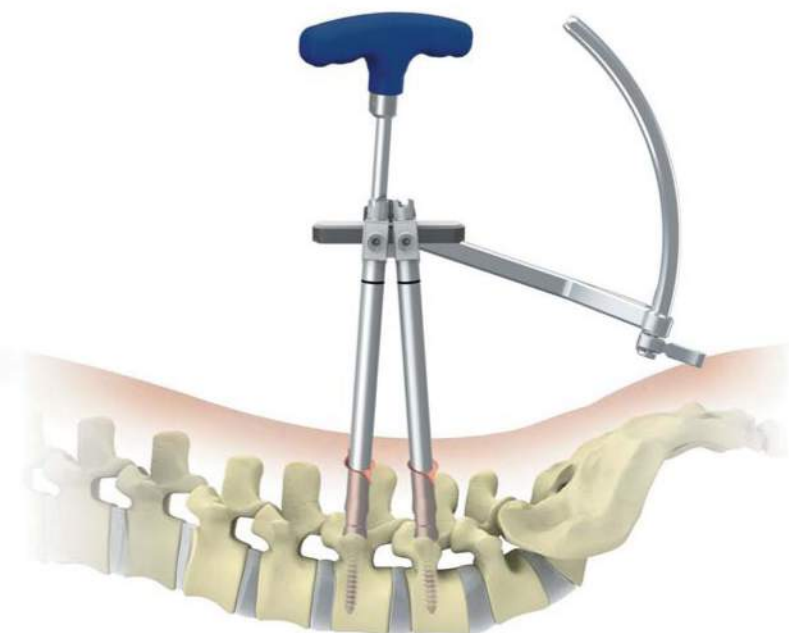
- 1) Assemble the Holder Clamp over the Holder set and place the projected open part of the clamp left side. Fix the device to the Pedicle Screw extension set using the small T-Wrench. The direction of both clamps must be facing the same side.



- 2) Assemble the Rod Insertion Set to the Holder Clamp. Engage the socket of the Insertion Set to the Clamp. It clicks when a assembling is well done.
- 3) Lock the Rod Insertion Set using the Small T-Wrench.

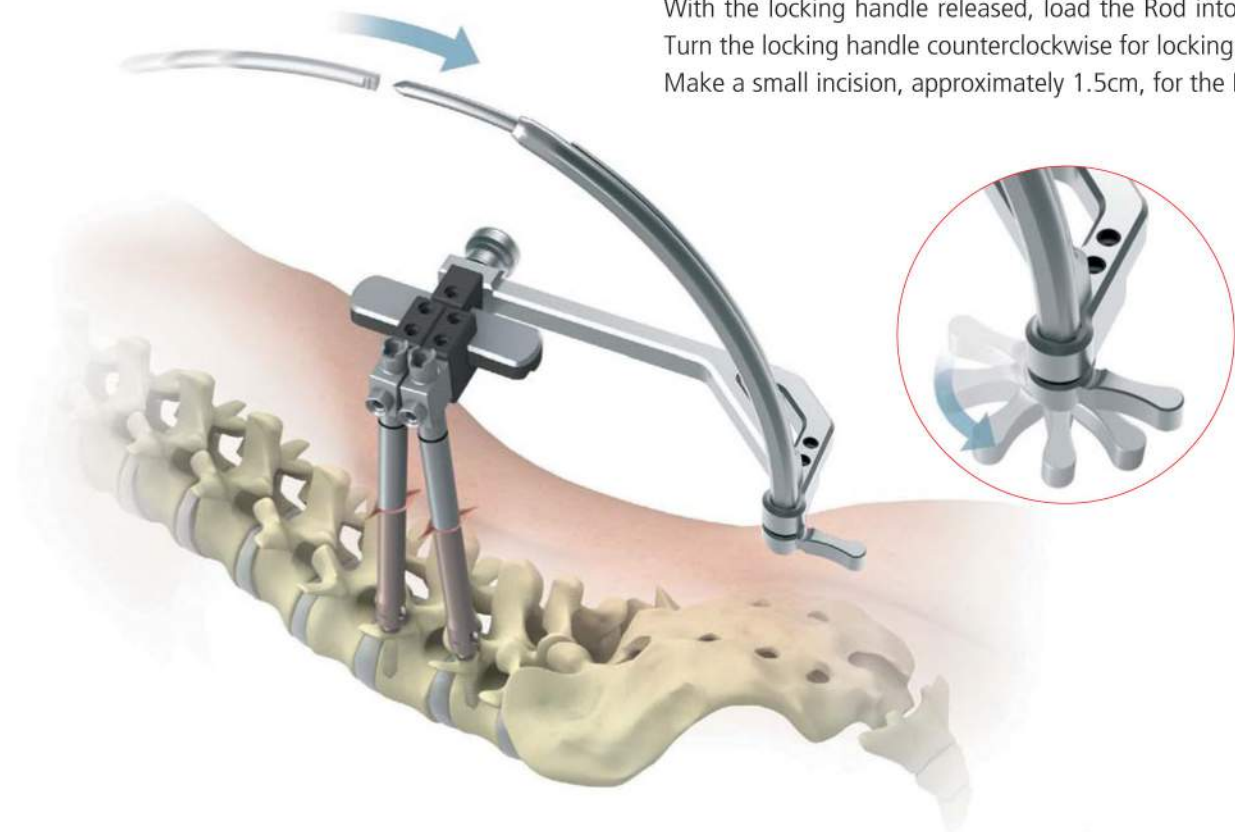


- 4) After the Rod Insertion Set and the Holder Clamp are assembled, make sure if
 - the Holder Clamps are horizontally arranged to each other.
 - the holders are in the bilateral symmetry to each other.



8. Rod assembly (Select the appropriate sized rod.)

With the locking handle released, load the Rod into the hole. Turn the locking handle counterclockwise for locking. Make a small incision, approximately 1.5cm, for the Rod entry.

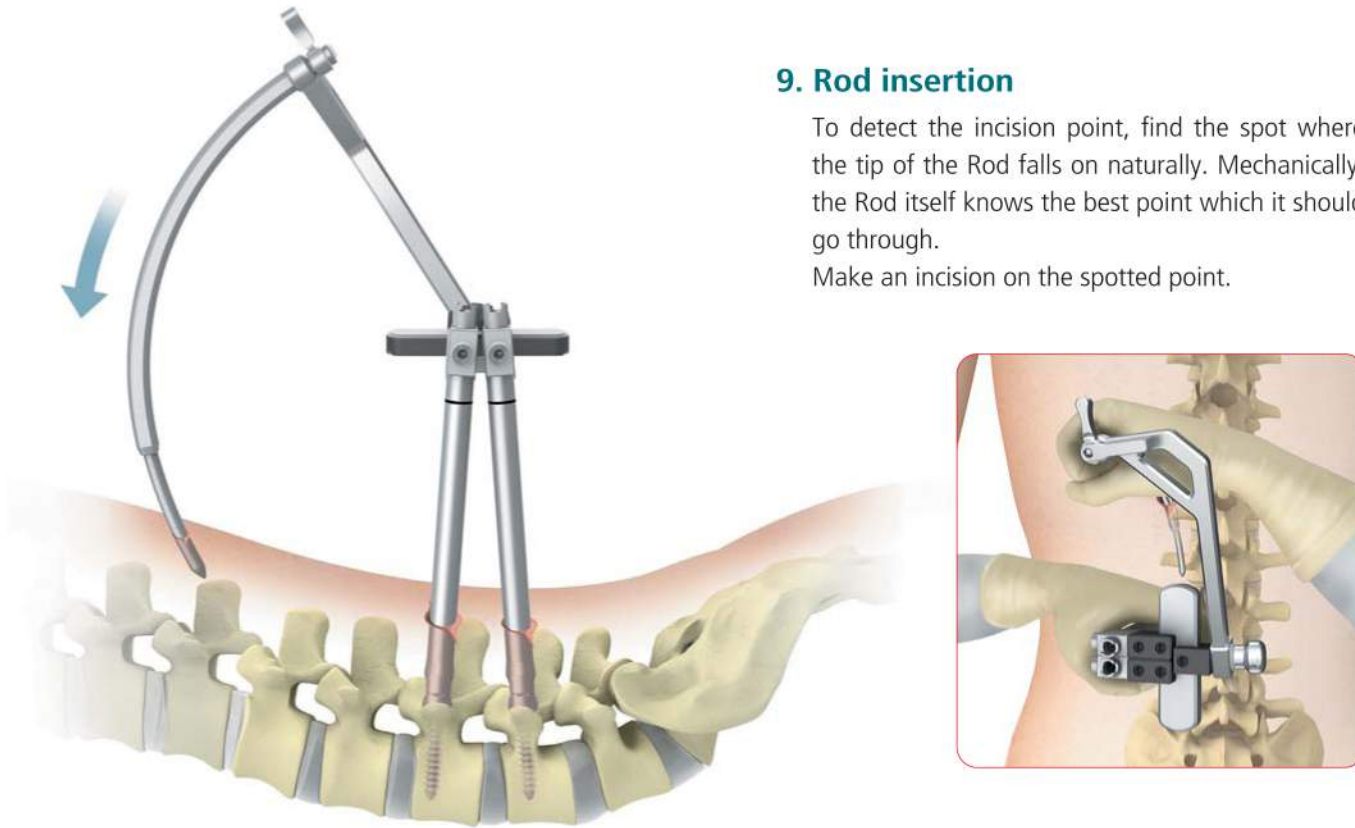


Tip: Grab the shoulder of the Rod Insertion Set and gently move it back and forth perpendicularly to the rod inserting direction for 2~3 times. This helps implanted Poly-Screws comfortably settle in their places and make the Rod insertion easier.



9. Rod insertion

To detect the incision point, find the spot where the tip of the Rod falls on naturally. Mechanically, the Rod itself knows the best point which it should go through.
Make an incision on the spotted point.



Advance the rod assembly clockwise through the underlying fascia and muscle until it intersects through slots of the screws. But avoid inserting it by excessive force, since it may cause wrong insertion like failing to meet slots of screw heads. Assure the placement of the rod with flurosopic image on AP and lateral view. The margin of each end should be about 5mm.

Caution: Don't separate the Rod from the Insertion Set until it is securely fixed by Nuts.

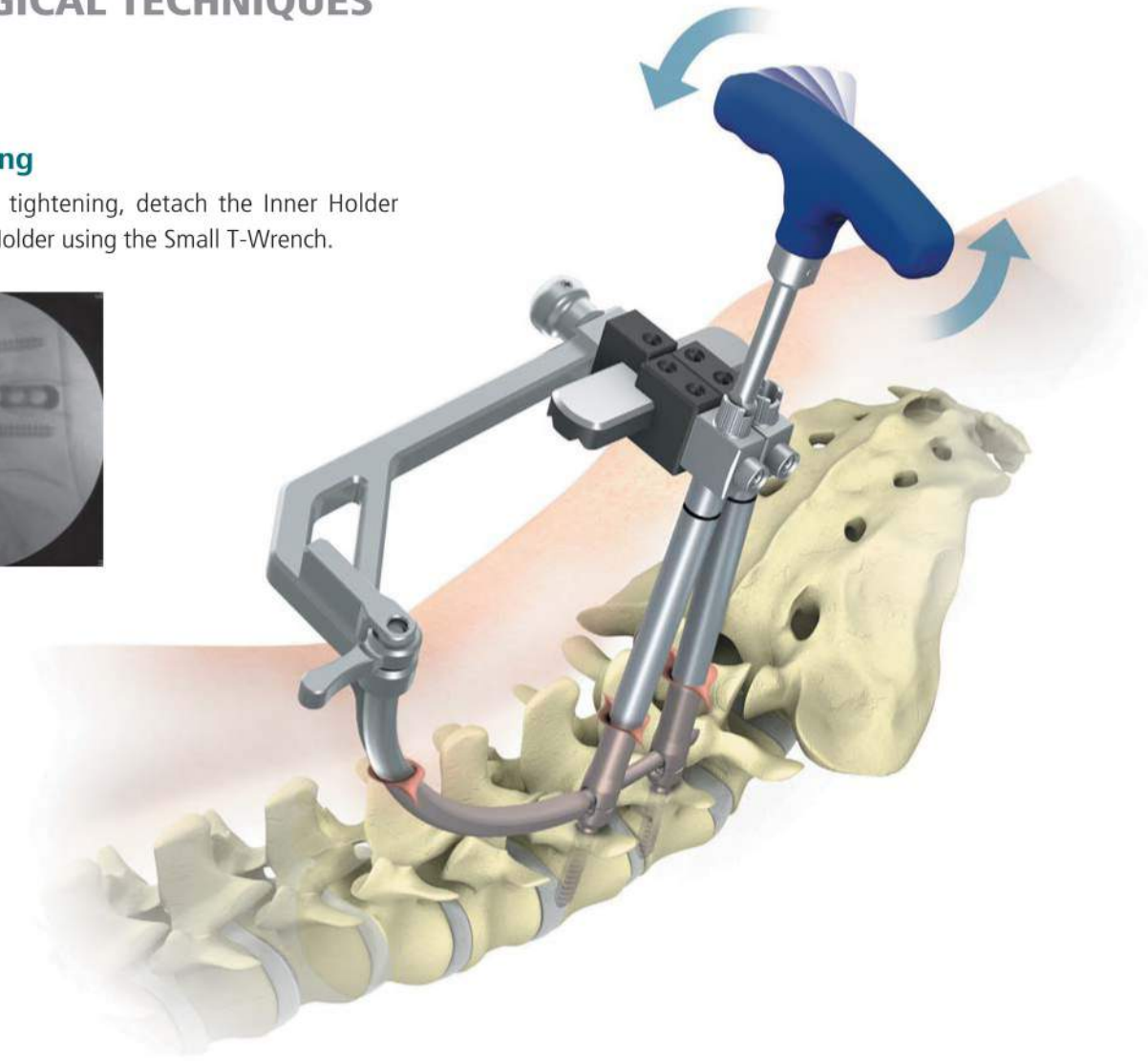
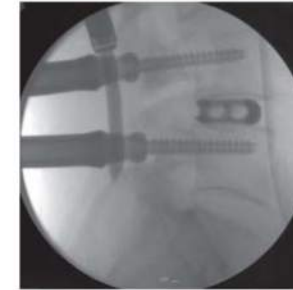


Checking out the insertion.

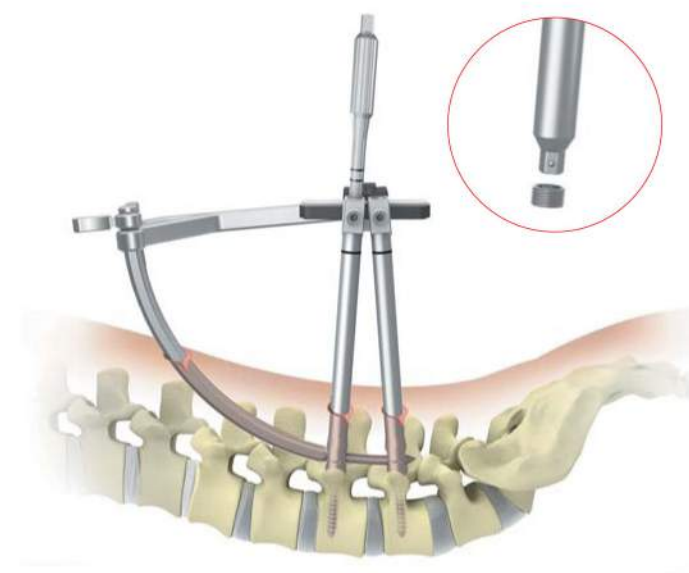
Place the Nut Starter inside the Inner Holder. Two Marks will be shown on the shaft of Nut Starter if the insertion is performed successfully. If a single mark is shown, the insertion is not properly done.

10. Nut tightening

Prior to the nut tightening, detach the Inner Holder from the Outer Holder using the Small T-Wrench.



Engage the Nut to the Pedicle Screw using the Nut Starter for initial tightening

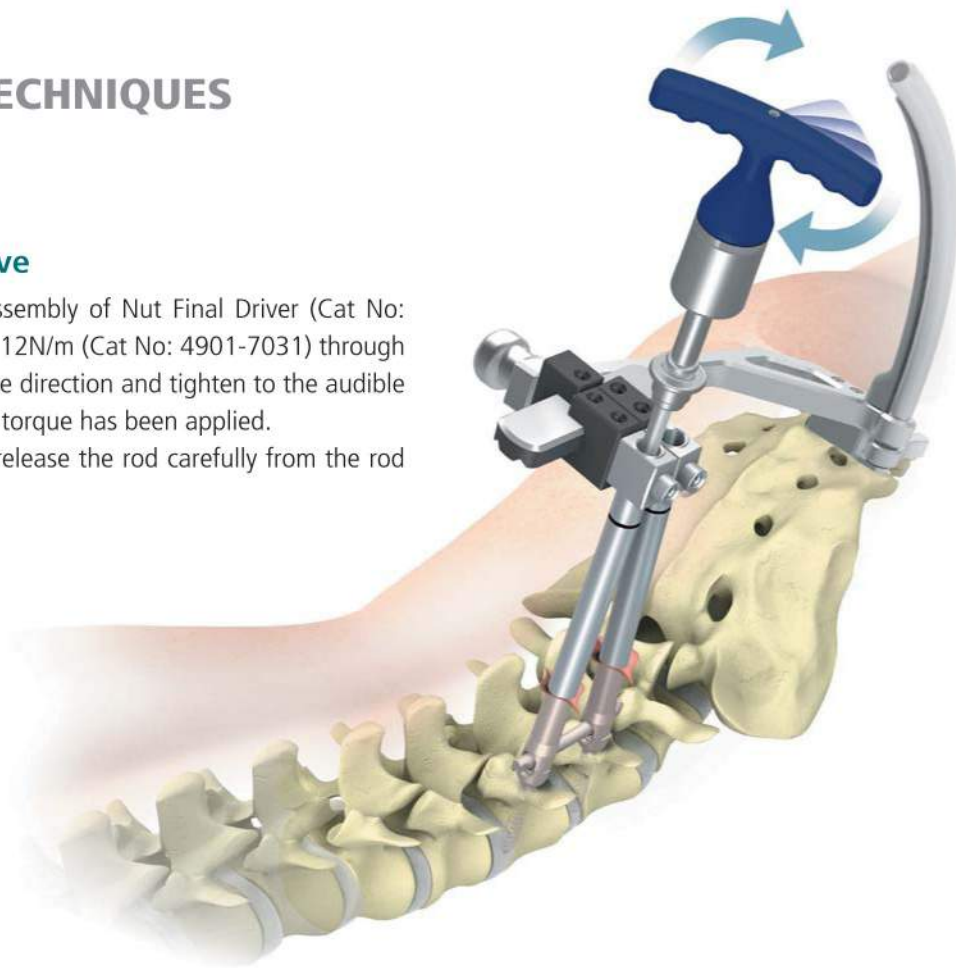
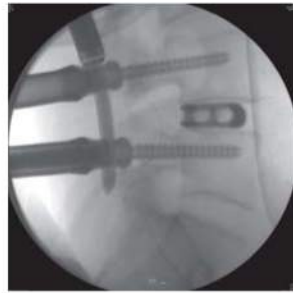


Finalize the tightening with the Final Nut Driver (Cat no. 4901-3010) to achieve the solid fixation. Use the Compressor for provisional tightening, if needed, before the tightening of the other nut.



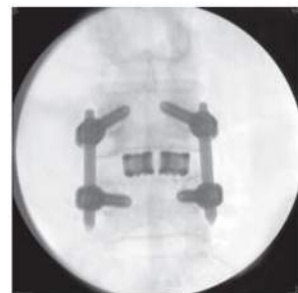
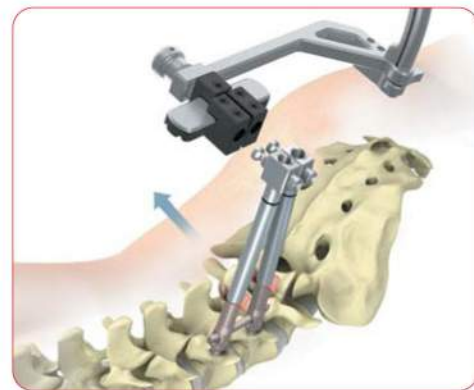
11. Final tightening and remove

Inserting the Driver which is the assembly of Nut Final Driver (Cat No: 4903-3801) and Torque Limiter for 12N/m (Cat No: 4901-7031) through the Screw Holder. Turn in a clockwise direction and tighten to the audible click, which indicates that 12N/m of torque has been applied. After final tightening of all of nuts, release the rod carefully from the rod Insertion Set.



12. Assembly removal

Detach the Rod Inserter Assembly from the Rod by following the reversing order of attachment and remove the Pedicle Screw Extension Set from the Pedicle Screw.

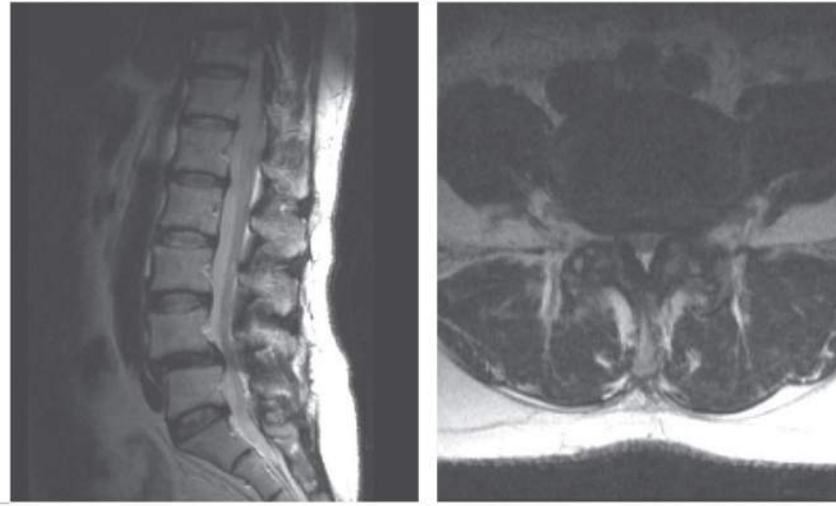


**CASE STUDIES -
PREOPERATION & POSTOPERATION**

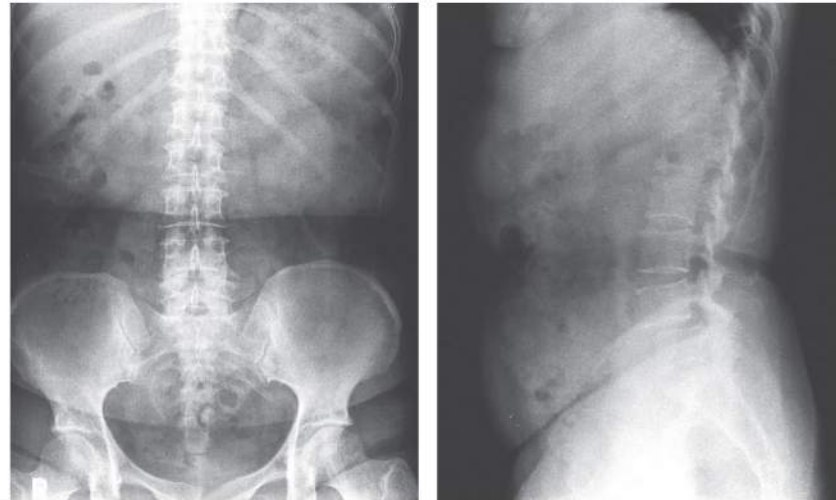
L5 Spondylolisthesis, Isthmic type
L3-4-5 Spinal stenosis
T12 Pyogenic spondylitis

Case 1. L5 Spondylolisthesis, Isthmic type
OP Name : Mini-open PLIF

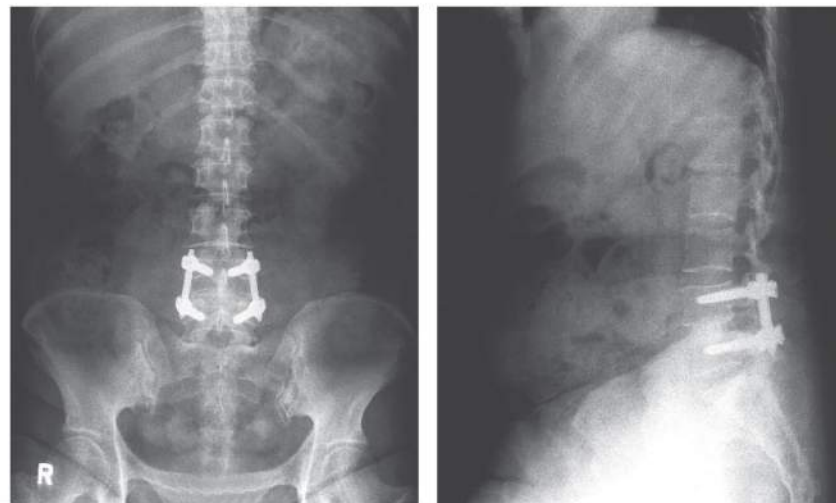
Pre OP MRI



Pre OP X-ray

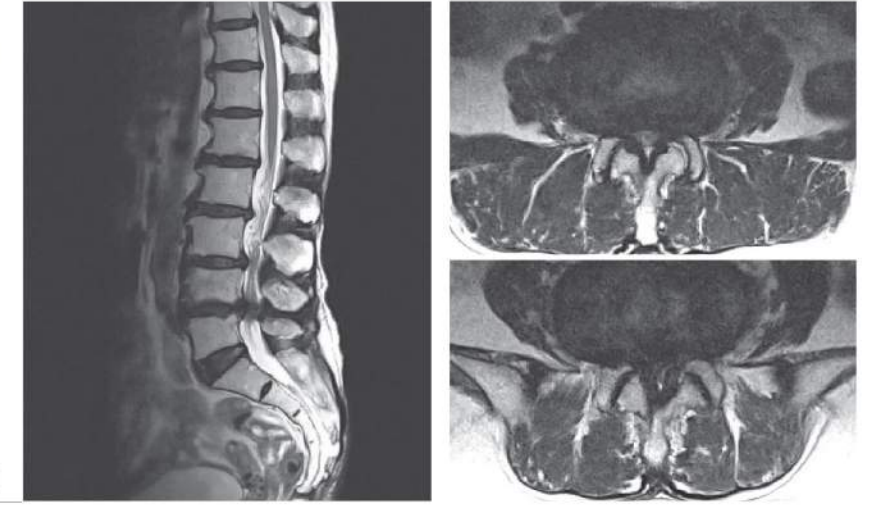


Post OP X-ray

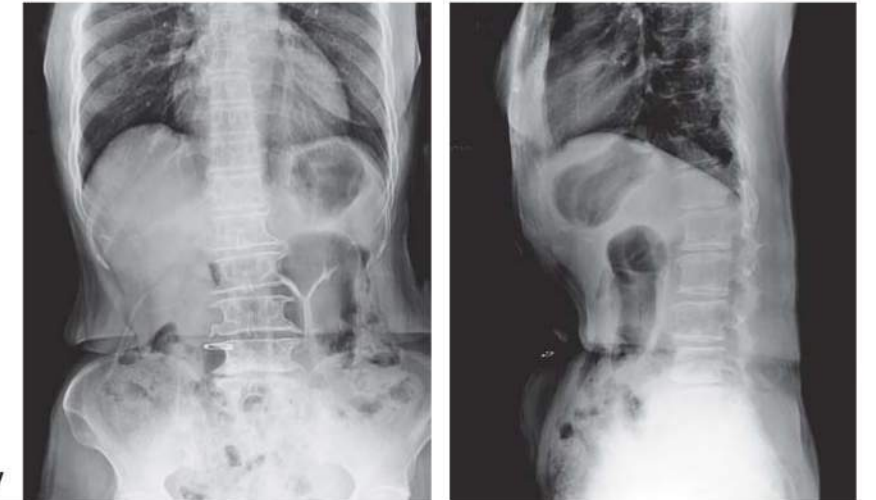


Case 2. L3-4-5 Spinal stenosis
OP Name : Mini-open PLIF of L3-4-5

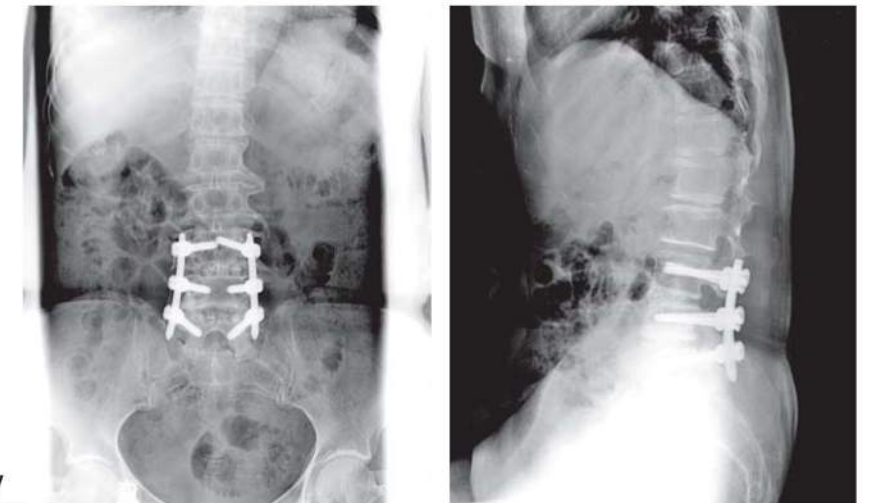
Pre OP MRI



Pre OP X-ray



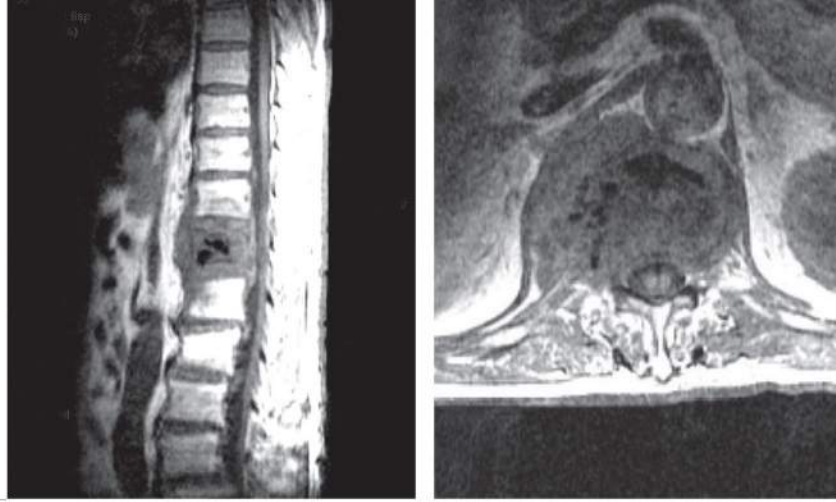
Post OP X-ray



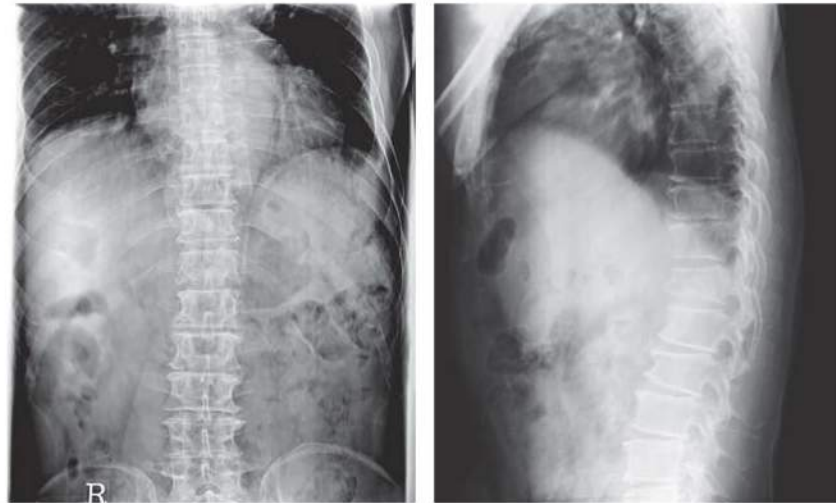
Case 3. T12 Pyogenic spondylitis

OP Name : Miniopen ALIF with percutaneous post stabilization

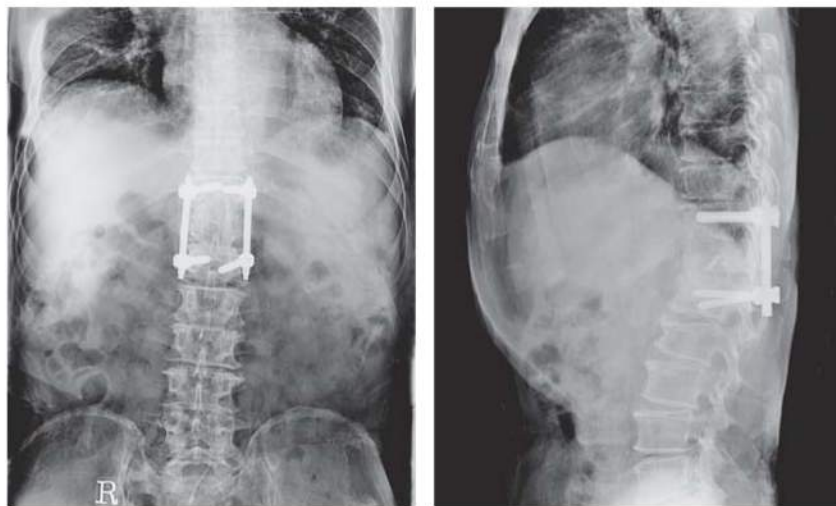
Pre OP MRI



Pre OP X-ray



Post OP X-ray


















PRODUCT INFORMATION


Implants Specifications
Instruments Specifications








* Advantages of APOLLON

Screw head - Rimmed edge	Save the screw head from being distorted as the Nut is deeply engaged into.
Screw joint- Threaded type	Prevent the screw joint from rotating. Enable the firm and secure fixation at the designated location.
Rod assembly - locking handle	Easy and quick loading/unloading of Rod. Simple yet secure.
Unique Alignment Guide	Easy Rod Insertion

Implants Specifications

Pedicule screw		
	4192-6535	Pedicule screw 6.5 × 35mm
	4192-6540	Pedicule screw 6.5 × 40mm
	4192-6545	Pedicule screw 6.5 × 45mm
	4192-6550	Pedicule screw 6.5 × 50mm
	4192-6555	Pedicule screw 6.5 × 55mm
	4192-7035	Pedicule screw 7.0 × 35mm
	4192-7040	Pedicule screw 7.0 × 40mm
	4192-7045	Pedicule screw 7.0 × 45mm
	4192-7050	Pedicule screw 7.0 × 50mm
	4192-7055	Pedicule screw 7.0 × 55mm
	4192-7535	Pedicule screw 7.5 × 35mm
	4192-7540	Pedicule screw 7.5 × 40mm
	4192-7545	Pedicule screw 7.5 × 45mm
	4192-7550	Pedicule screw 7.5 × 50mm
	4192-7555	Pedicule screw 7.5 × 55mm

Nut		
	4232-0855	Nut 5.5mm(H)

Rod		
	4322-5740	Rod 5.7 × 40mm
	4322-5745	Rod 5.7 × 45mm
	4322-5750	Rod 5.7 × 50mm
	4322-5760	Rod 5.7 × 60mm
	4322-5770	Rod 5.7 × 70mm
	4322-5780	Rod 5.7 × 80mm
	4322-5790	Rod 5.7 × 90mm

► The design of products can be amended without prior consent.

Instruments Specifications

	Apollon VP Needle 4901-3019 VP Needle		Apollon Alignment Guide 4901-3016 Alignment Guide
	Apollon Guide Wire 4901-3037 Guide Wire 400mm (ø1.5mm) 4901-3038 Guide Wire 450mm (ø1.5mm) 4901-3039 Guide Wire 500mm (ø1.5mm)		Apollon Dilators 4901-3003 Dilators ø5.7mm 4901-3004 Dilators ø9.7mm 4901-3005 Dilators ø14.0mm 4901-3020 Dilators ø15.5mm
	Apollon Cannula Tap 5.5mm 4901-3026 Cannula Tap 5.5mm		Apollon Cannula Tap 6.5mm 4901-3027 Cannula Tap 6.5mm
	Apollon Rod length gauge 4901-3036 Rod length gauge		Apollon Screw Driver 4901-3008 Screw Driver
	Apollon Nut Starter 4901-3009 Nut Starter		Apollon Nut Final Driver 4901-3801 Nut Final Driver
	Apollon Outer (Screw) Holder 4901-3023 Outer (Screw) Holder		Apollon Inner (Screw) Holder 4901-3024 Inner (Screw) Holder

► The design of products can be amended without prior consent.

Lined writing area for page 26.

Lined writing area for page 27.



SOLCO.
LIFE & SCIENCE

www.solco.co.kr  ISO9001 ISO13485 **510(K)**

HEAD OFFICE

#34-6, Keumam-ri, Seotan-myeon, Pyeongtaek, Gyeonggi-do 451-852 Korea
Tel. +82-31-664-4101 Fax. +82-31-663-6520

SEOUL OFFICE

13F, #505-14, Gasan-dong, Geumcheon-gu, Seoul 158-803 Korea
Tel. +82-2-2082-7700 Fax. +82-2-2082-7701