



Premium Posterior Spinal Polyaxial Screw System



“Helping our animal
friends
one paw at a time”

Small Animal Veterinary
Surgical Technique

Introduction

Veterinary Polyaxial Screw System

Abmvet is committed to providing customers with excellent quality products and superior customer service. Our company conducts business in an open and honest manner and rejects business practices that unnecessarily increase the cost of health treatment. Abmvet's products fulfill the requirement of ISO 13485. Our Quality Management System carries out all the necessary follow-ups at all levels of our products. Abmvet's products have been placed in quality on domestic and international markets. Abmvet's veterinary products that provide comprehensive medical solutions to help veterinarians treat patients successfully. Abmvet's products portfolio includes technically advanced implants and instruments: The Abmvet Polyaxial Screw System is a titanium screw-rod fixation system that fuses new in veterinary polyaxial screw technology with human conventional fixation techniques. The set was designed to maximize treatment options.

Before the most appropriate method for treating a problem can be selected, the spinal deformity problem must be identified and assessed. Developing surgical skills and familiarity with specialized instrumentation is necessary for performing most spinal procedures. Veterinarians should be aware of their limitations and refer complicated cases when necessary.

Spinal deformity patients should have a thorough and complete physical evaluation. Serial examinations are essential because severe or potentially lethal problems may not appear for several hours or days after the injury.

Abmvet Posterior Spinal has become the spinal anchor of choice because of the superior biomechanics of this technique. The system is a comprehensive solution for posterior thoracolumbar surgical cases and widely used for the treatment of scoliosis, deformity and degenerative disc disease pathologies.

Implant Overview

Abmvet Posterior Spinal is comprised of Poly-axial screws in various diameters and lengths, spinal rods in various lengths, cross-connectors and set screws. All implant components are manufactured from titanium alloy (Ti-6Al-4V ELI) that conforms to ASTM F136. The feature and benefits of the system are following,

- Low profile system
- Easy lock system
- Cylindrical feature Self-Tapping
- 40°-52° with Poly-axial screws
- Implantable pedicle screws as Polyaxial Screws
- Designed to minimize soft tissue interaction
- Excellent anchoring stability of the implant guaranties lasting safety

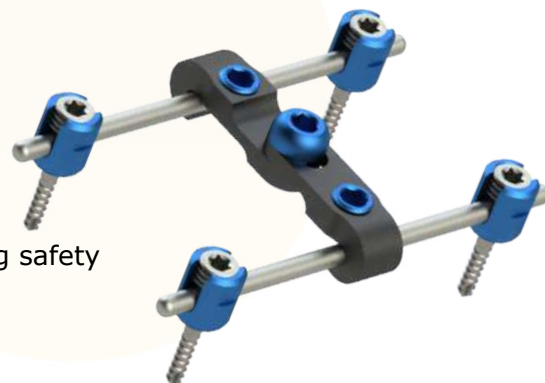



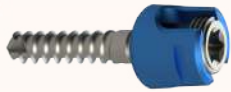







Figure 1: Premium Posterior Spinal System





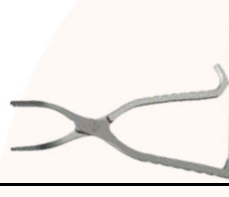






Premium Posterior Spinal Polyaxial Set Implants

# Code	Description	Hole/Size	Qty	Image
MPS2014	Polyaxial Screw, Ø2,0 mm, 14 mm	14 mm	4	
MPS2016	Polyaxial Screw, Ø2,0 mm, 16 mm	16 mm	8	
MPS2018	Polyaxial Screw, Ø2,0 mm, 18 mm	18 mm	8	
MPS2020	Polyaxial Screw, Ø2,0 mm, 20 mm	20 mm	4	
MPS2514	Polyaxial Screw, Ø2,5 mm, 14 mm	14 mm	4	
MPS2516	Polyaxial Screw, Ø2,5 mm, 16 mm	16 mm	8	
MPS2518	Polyaxial Screw, Ø2,5 mm, 18 mm	18 mm	8	
MPS2520	Polyaxial Screw, Ø2,5 mm, 20 mm	20 mm	4	
MPS3524	Polyaxial Screw, Ø3,5 mm, 24 mm	24 mm	8	
MPS3526	Polyaxial Screw, Ø3,5 mm, 26 mm	26 mm	8	
MPS3528	Polyaxial Screw, Ø3,5 mm, 28 mm	28 mm	8	
MPS3530	Polyaxial Screw, Ø3,5 mm, 30 mm	30 mm	8	
MPS4526	Polyaxial Screw, Ø4,5 mm, 26 mm	26 mm	8	
MPS4528	Polyaxial Screw, Ø4,5 mm, 28 mm	28 mm	8	
MPS4530	Polyaxial Screw, Ø4,5 mm, 30 mm	30 mm	8	
MPS4534	Polyaxial Screw, Ø4,5 mm, 34 mm	34 mm	8	
MPS4536	Polyaxial Screw, Ø4,5 mm, 36 mm	36 mm	8	
MPS4540	Polyaxial Screw, Ø4,5 mm, 40 mm	40 mm	8	
MTC2525	Transverse Connector, Ø2,5, 25 mm	25 mm	1	
MTC2535	Transverse Connector, Ø2,5, 35 mm	35 mm	1	
MTC2545	Transverse Connector, Ø2,5, 45 mm	45 mm	1	
MTC3535	Transverse Connector, Ø3,5, 35 mm	35 mm	1	
MTC3545	Transverse Connector, Ø3,5, 45 mm	45 mm	1	
MTC3555	Transverse Connector, Ø3,5, 55 mm	55 mm	1	
MLC2510	Lateral Connector, Ø2,5, 10 mm	10 mm	1	
MLC2512	Lateral Connector, Ø2,5, 12 mm	12 mm	1	
MLC2514	Lateral Connector, Ø2,5, 14 mm	14 mm	1	
MLC3514	Lateral Connector, Ø3,5, 14 mm	14 mm	1	
MLC3516	Lateral Connector, Ø3,5, 16 mm	16 mm	1	
MLC3518	Lateral Connector, Ø3,5, 18 mm	18 mm	1	
MSR2530	Rod, Ø2,5, 30 mm	30 mm	2	
MSR2545	Rod, Ø2,5, 45 mm	45 mm	2	
MSR2560	Rod, Ø2,5, 60 mm	60 mm	2	
MSR2575	Rod, Ø2,5, 75 mm	75 mm	2	
MSR2533	Rod, Ø2,5, 300 mm	300 mm	2	
MSR3540	Rod, Ø3,5, 40 mm	40 mm	2	
MSR3560	Rod, Ø3,5, 60 mm	60 mm	2	
MSR3580	Rod, Ø3,5, 80 mm	80 mm	2	
MSR3511	Rod, Ø3,5, 100 mm	100 mm	2	
MSR3533	Rod, Ø3,5, 300 mm	300 mm	2	
Total			160	








Premium Posterior Spinal Polyaxial Set Instruments

# Code	Description	Hole/Size	Qty	Image
MTL2500	Polyaxial Screw Set Outer Container		1	
MTL2600	Polyaxial Screw Set Screw-Connector Tray		1	
MTL2720	Polyaxial Screw Driver, For $\varnothing 2,0$	For $\varnothing 2,0$	1	
MTL2745	Polyaxial Screw Driver, For $\varnothing 2,5-3,5-4,5$	For $\varnothing 2,5-3,5-4,5$	1	
MTL1200	Depth Gauge	0-40mm	1	
MTL2820	Set Screw Driver, For $\varnothing 2,0$	For $\varnothing 2,0$	1	
MTL2845	Set Screw Driver, For $\varnothing 2,5-3,5-4,5$	For $\varnothing 2,5-3,5-4,5$	1	
MTL2920	Set Screw Holder, For $\varnothing 2,0$	For $\varnothing 2,0$	1	
MTL2945	Set Screw Holder, For $\varnothing 2,5-3,5-4,5$	For $\varnothing 2,5-3,5-4,5$	1	
MTL3000	Connector Set Screw Driver		1	
MTL3100	Knob Quick Coupling Handle		1	
MTL3220	Probe, For $\varnothing 2,0-2,5$	For $\varnothing 2,0-2,5$	1	
MTL3235	Probe, For $\varnothing 3,5-4,5$	For $\varnothing 3,5-4,5$	1	
MTL3300	Bone AWL		1	

Premium Posterior Spinal Polyaxial Set Instruments

# Code	Description	Hole/Size	Qty	Image
MTL3400	In-situ bender, Left	Left	1	
MTL3400	In-situ bender, Right	Right	1	
MTL3500	Rod Pusher		1	
MTL3600	Distractor		1	
MTL3700	Compressor		1	
MTL3801	Torque Handle, 1 Nm	1 Nm	1	
MTL3803	Torque Handle, 3 Nm	3 Nm	1	
MTL3900	T Quick Coupling Handle, T QC	T QC	1	
MTL4000	Rod Bender		1	
MTL4100	L Anti Torque		1	
MTL0315	Drill Bit, Ø1,5	Ø1,5	1	
MTL0320	Drill Bit, Ø2,0	Ø2,0	1	
MTL0330	Drill Bit, Ø3,0	Ø3,0	1	
MTL0340	Drill Bit, Ø4,0	Ø4,0	1	

Premium Posterior Spinal Polyaxial Set Instruments

# Code	Description	Hole/Size	Qty	Image
MTL4225	Tap, 2.5mm	2.5mm	1	
MTL4235	Tap, 3.5mm	3.5mm	1	
MTL4245	Tap, 4.5mm	4.5mm	1	
MTL4301	Straight Feeler		1	
MTL4302	Curved Feeler		1	
MTL4400	Rod Holder Forcep		1	
MTL4500	Persuader		1	
Total			34	

Surgical Technique

1. Patient Positioning

The patient is placed under anesthesia and positioned dorsal recumbency with head and neck extended. The radiographic equipment may be used to assist in confirm the affected disc level and implant for intraoperative placement of the implants. The surgical approach is carried out through a standard midline incision to the spinal column over anatomic position of the spinous process.

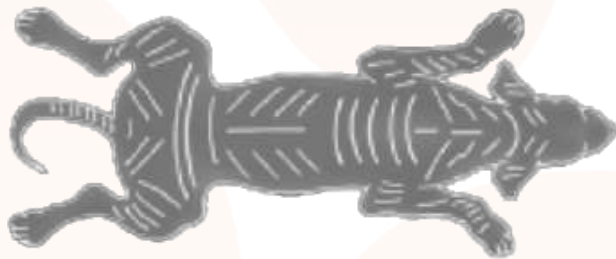


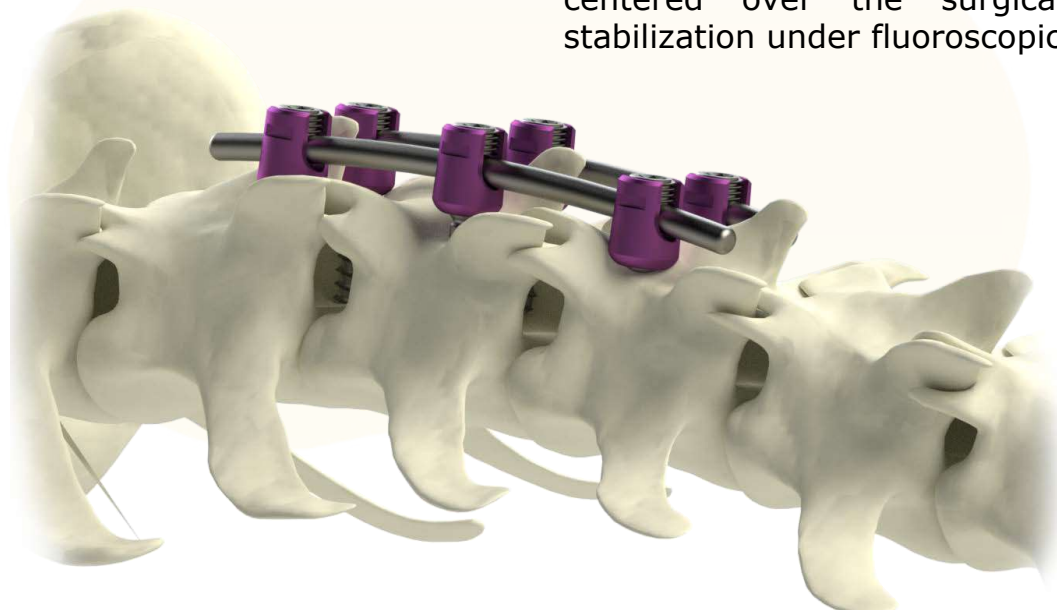
Figure 2: Dorsal Position

Approximate skin tension line in dogs.



Figure 3: Skin tension line

Incisions made across tension lines. Perpendicular incisions gape requires more sutures for closure. The incision is centered over the surgical site of stabilization under fluoroscopic guidance.



2. Screws Insertion

In preparation for the screw insertion process, it is important to determine the sagittal orientation of the pedicles for the vertebrae to be instrumented. A plain intraoperative lateral radiograph is sufficient for this purpose.

Identify the appropriate anatomical landmarks for creating the entry points of the lead holes for screw insertion (example for Lumbar subluxation and screw placement in **(Figure 4-5)**).



Figure 4: Example Anterior Posterior (AP) view of lead hole location for lumbar fusion.

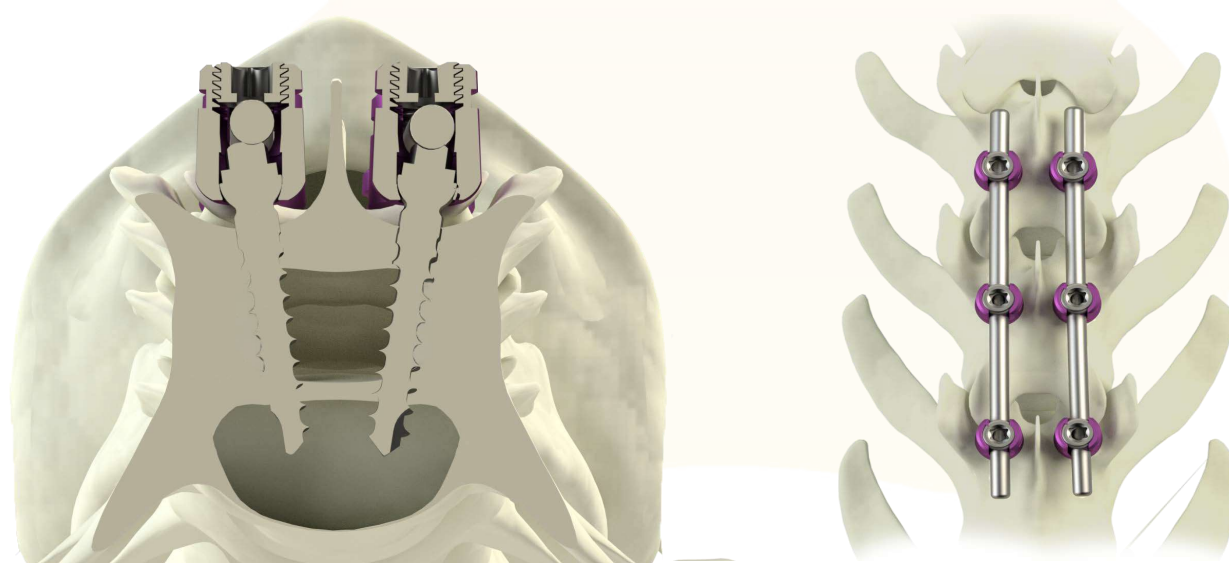
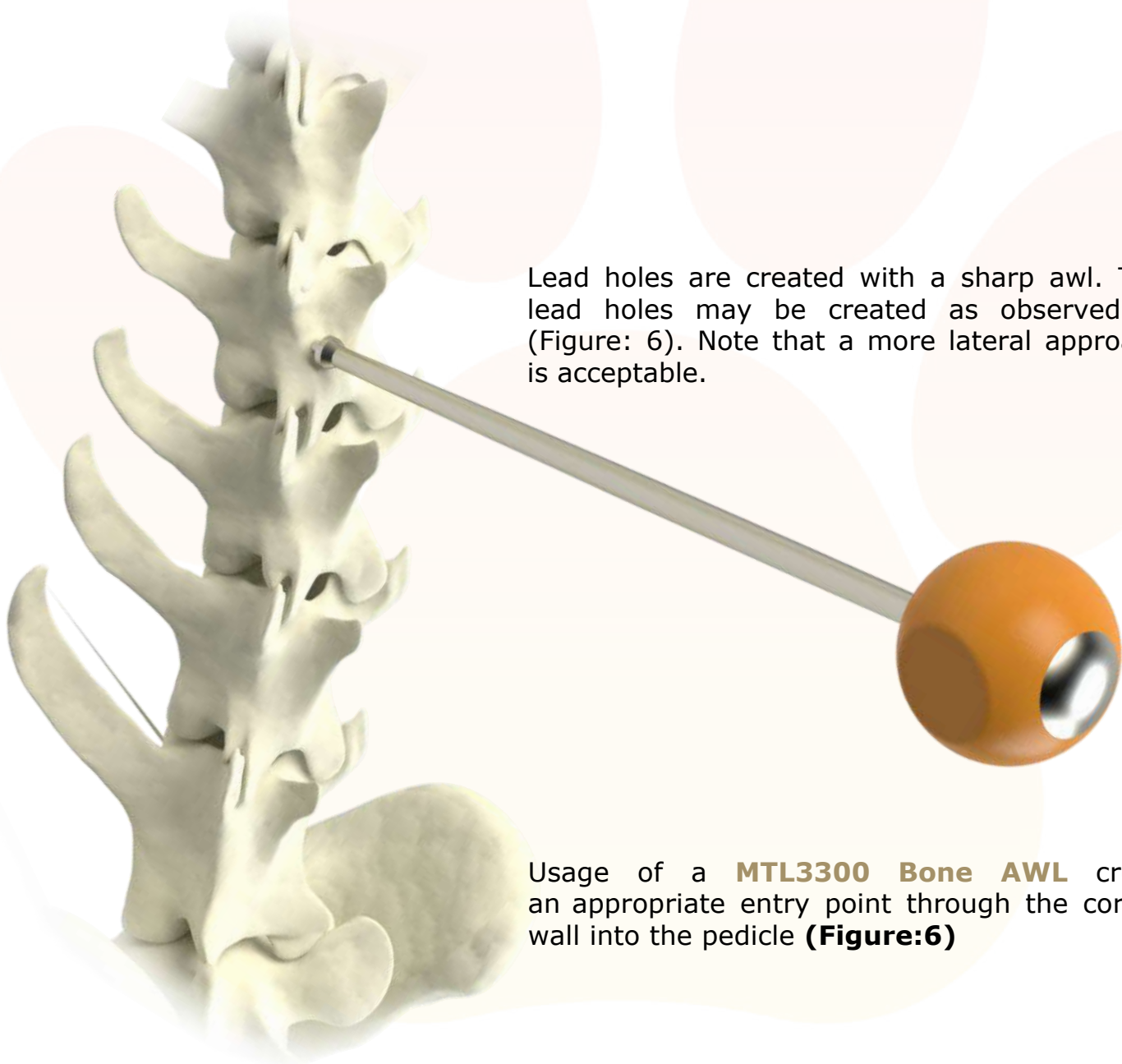


Figure 5: Example screw placement in vertebral body.

2. Screws Insertion

Entry site for individual patient may slightly be different according to the anatomical variations between patient. Such kind of differences must be noted on the pre-operative MRI, CT images as well as on the intraoperative X-Rays. The pedicle entry point is intersected by vertical line connecting the lateral edges of bony crest extension of the parts interauriculares and the horizontal line that bisects the middle of the transverse process.



Lead holes are created with a sharp awl. The lead holes may be created as observed in (Figure: 6). Note that a more lateral approach is acceptable.

Usage of a **MTL3300 Bone AWL** create an appropriate entry point through the cortical wall into the pedicle (**Figure:6**)

Figure 6: MTL3300 Bone AWL

2. Screws Insertion

After lead holes are created, it is suggested to use a **MTL0315 Drill Bit, Ø1.5**, for Ø2.0 polyaxial screw(**Figure 7**).

MTL3220/MTL3235 Probe (Figure 11)(optional choice of **MTL0325/MTL35/MTL45 Drill Bits**), and **MTL4225/MTL4235/MTL4254 Tabs (Figure 8)** and are suggested to use for Ø2.5, Ø3.5, and Ø4.5 polyaxial screws. Note that a more lateral approach is acceptable.

It is also suggested to determine the depth of the hole, a **MTL1200 Depth Gauge (Figure 9)** for Ø2.0 polyaxial screws, and a **MTL4301/MTL4302 Feelers (Figure 10)** is suggested to palpate the prepared pedicle to confirm pedicle wall integrity for Ø2.5, Ø3.5, and Ø4.5 polyaxial screw systems. Note that a more lateral approach is acceptable.

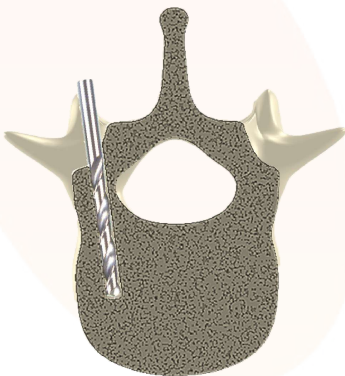


Figure 7: Lead hole drilling, cross-sectional view and screw positions.



Figure 8: MTL4225/MTL4235/MTL4254 Tab



Figure 9: MTL1200 Depth Gauge



Figure 8: MTL4301 Straight Feeler and MTL4302 Curved Feeler

Figure 11: MTL3220/MTL3235 Probe(Thin/Thick)

2. Screws Insertion

After determining the appropriate Screw length, attach the **MTL3900 T Quick Coupling Handle** with to the **MTL2720/MTL2745 Polyaxial Screw Driver** **Figure 12**. Insert the Screwdriver into the inner of the Screw and slide the Screwdriver sleeve down and thread into the head of the screw after then rotating the central locking wheel clockwise.



Figure 12: MTL3900 T Quick Coupling Handle and MTL2720/MTL2745 Polyaxial Screw Driver.

2. Screws Insertion

The Polyaxial into Screws can be inserted pedicle to the pre-determined depth.

Turn the **MTL3900 T Quick Coupling Handle** clockwise to insert the screw.

Once the screw is fully inserted, loosen the screw from the polyaxial screwdriver by turning the central locking wheel counter-clockwise. These steps shall repeated for all remaining other screws.



Figure 13: Inserting screws into vertebrae using the MTL3900 T Quick Coupling Handle and MTL2720/MTL2745 Polyaxial Screw Driver.

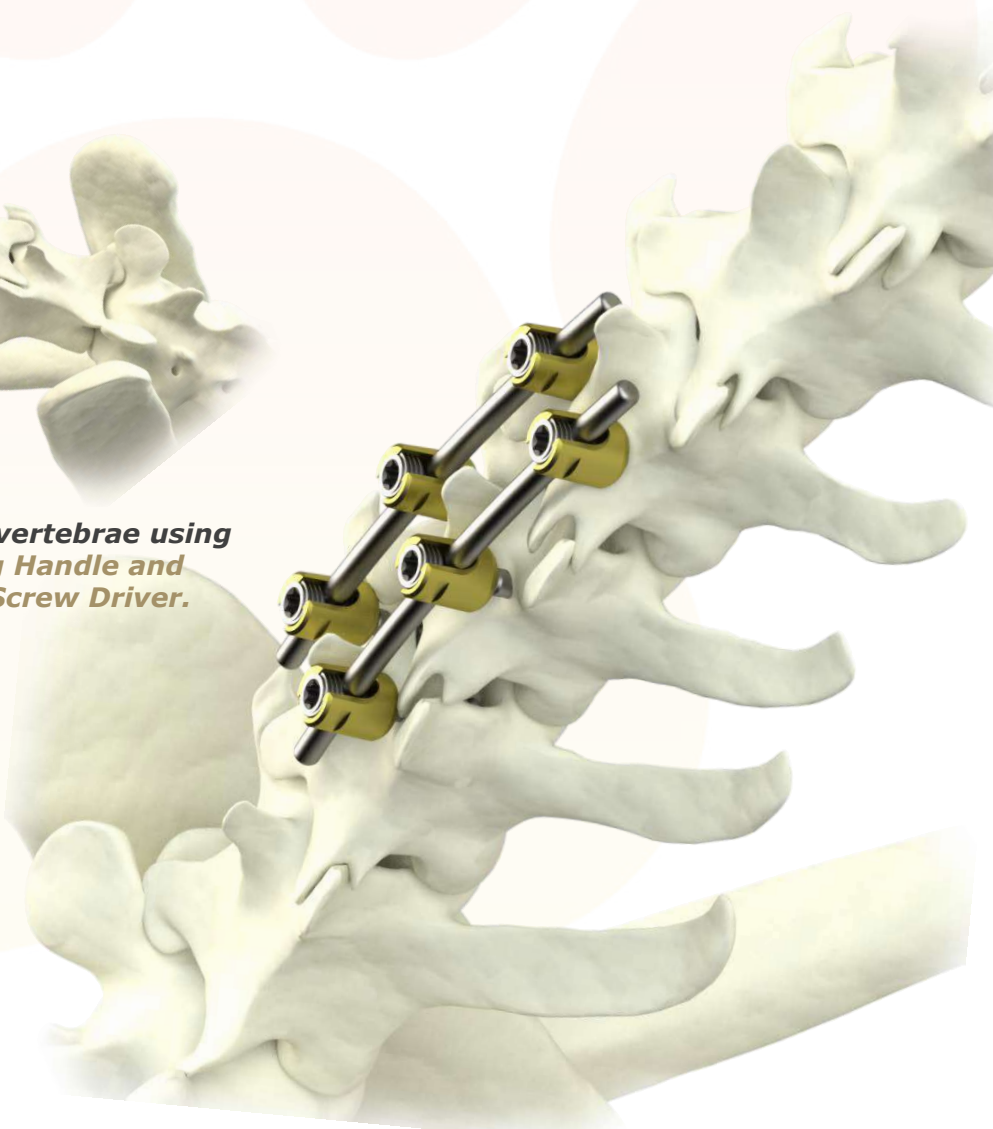


Figure 14: Screw thread depth placement of Screws

3. Rod and Set Screws Insertion

Rod Preparation

Choose the appropriate straight rod in a variety of lengths ($\text{Ø}2,5:30/45/60/75/300\text{mm}$, $\text{Ø}3,5:40/60/80/100/300\text{ mm}$). In order to hold&place the rod MTL4400 Rod Holder, in order to turn&arrange the rod, **MTL3400 In-situ Bender, Left-Right** and are used(**Figure 15/16**) .



Figure 15: MTL4000 Rod Bender

The straight rod can be curved the desired lordosis using the **MTL4000 Rod Bender (Figure 15)**

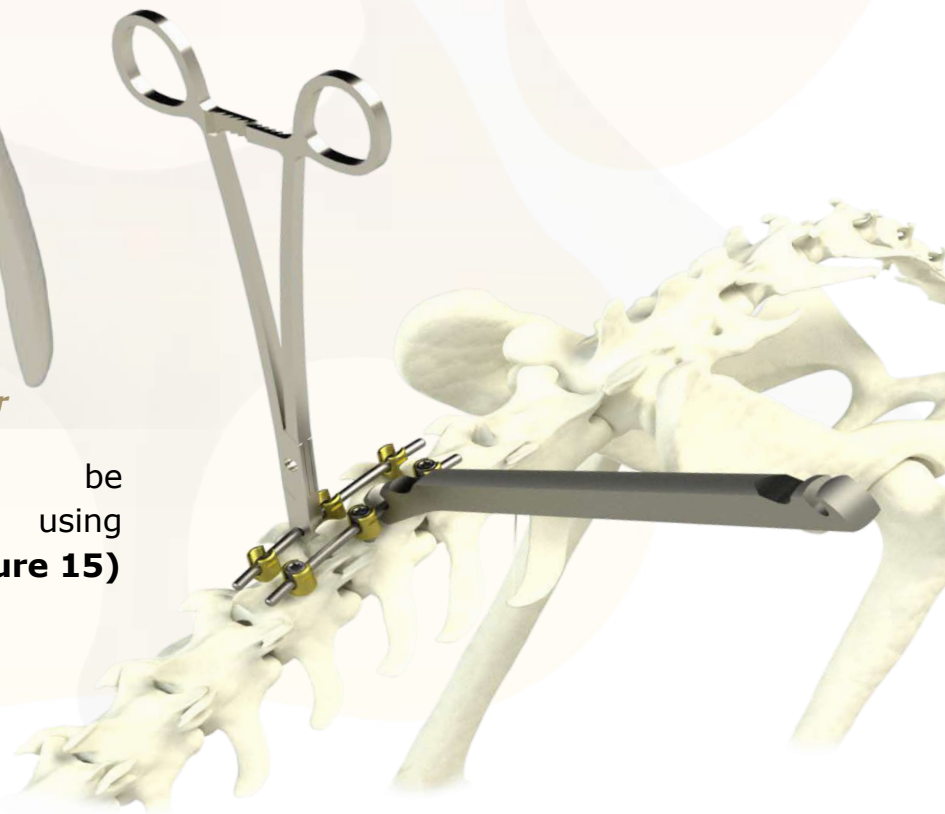


Figure 16: MTL3400 In-situ bender, Left-Right and MTL4400 Rod Holder Forcep

3. Rod and Set Screws Insertion

Insert the Rod into the cup of the Pedicle Screw. The rod is placed into the top-loading screws beginning from either the cranial or caudal direction. Check to ensure the rod can be properly seated in the screw head with no interference from anatomy. Failure to tighten with enough torque may lead to the set screw slowly backing out over time and rod loosening. Repeat set screw tightening for all screws in the system

Set Screws Insertion

If everything is order to place the **MTL3500 Rod Pusher** over the rod apply downward pressure. Once the rod is well in and seated within the screws head, install the set screws slightly by the **MTL2920/MTL2945 Set Screws Holder** (**Figure 17**).

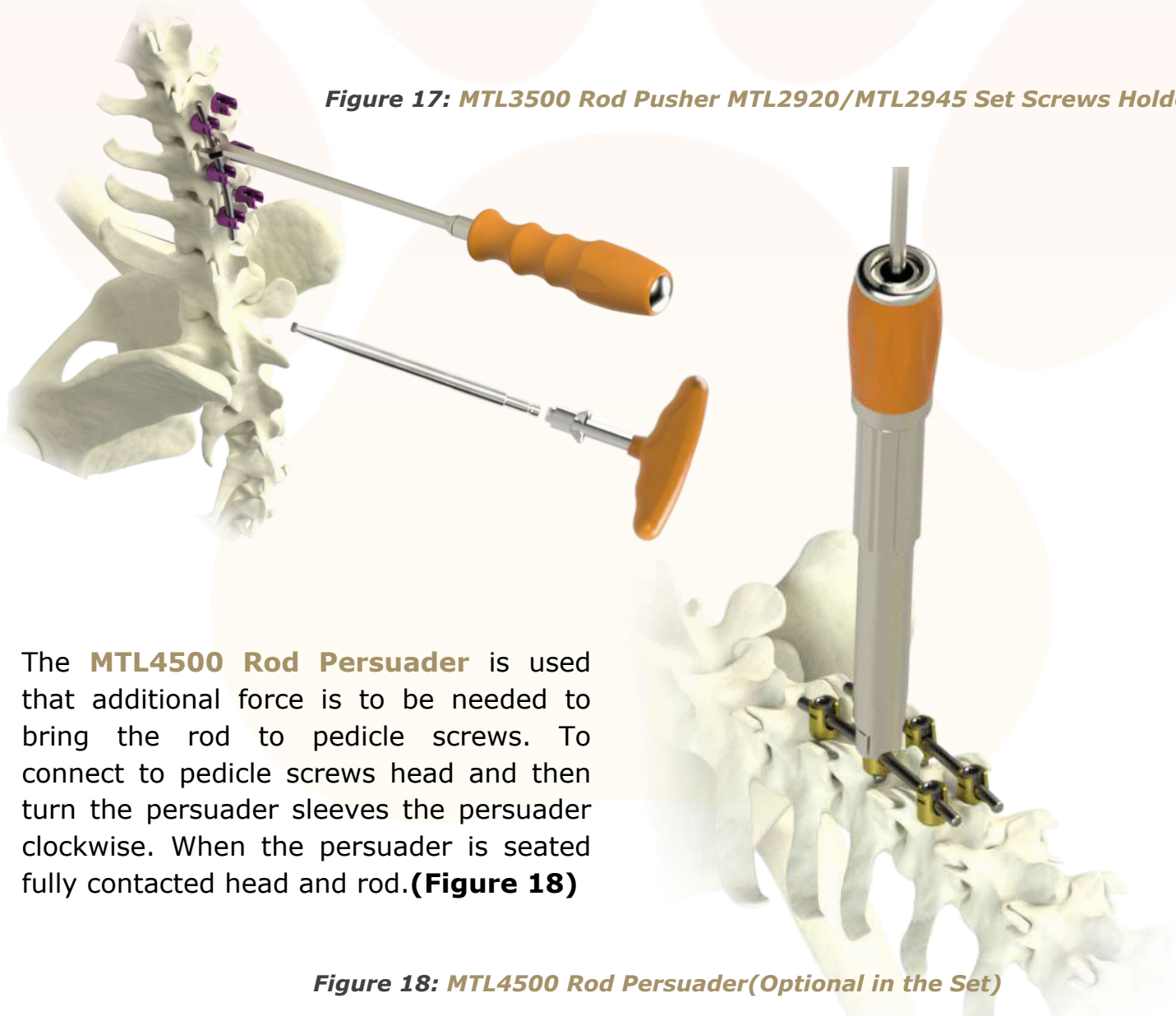


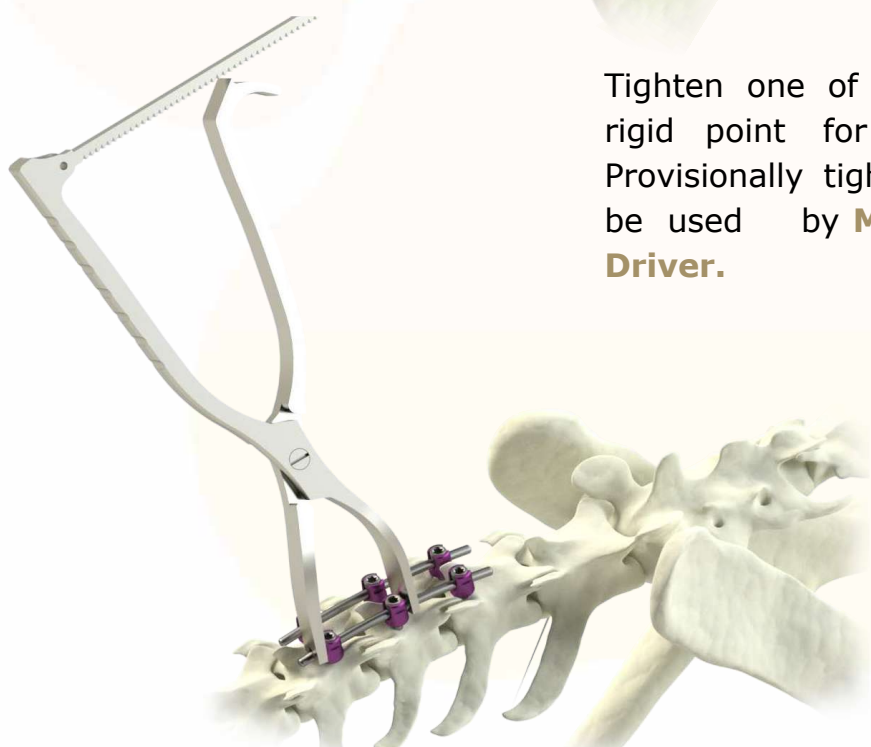
Figure 17: MTL3500 Rod Pusher MTL2920/MTL2945 Set Screws Holder

The **MTL4500 Rod Persuader** is used that additional force is to be needed to bring the rod to pedicle screws. To connect to pedicle screws head and then turn the persuader sleeves the persuader clockwise. When the persuader is seated fully contacted head and rod. (**Figure 18**)

Figure 18: MTL4500 Rod Persuader(Optional in the Set)

4. Compression or/and Distraction

The compression or distraction may be performed using **MTL3600 Distractor** or **MTL3700 Compressor** after all set screws have been installed.



Tighten one of the set screws to establish a rigid point for compression or distraction. Provisionally tighten the set screw will be used by **MTL2720/MTL2745 Set Screw Driver**.

Figure 19: MTL3600 Distractor or MTL3700 Compressor and MTL2720/MTL2745 Set Screw Driver

5. Final Tightening

Final tightening of the set screws is necessary complete and secure the construct by using **MTL3801/MTL3803 1/3 nm Torque Handle**, **MTL4100 L Anti-Torque** and **MTL2720/MTL2745 Set Screw Driver**. Place the **MTL4100 L Anti-Torque** over pedicle screws and rod.

Insert **MTL2720/MTL2745 Set Screw Driver** into the **1/3 nm Torque** and the **L Anti-Torque**.

Turn the **1/3 nm Torque Handle** clockwise to tighten until click sound a twice.

Once implantation is complete, it is recommended that the construct should be checked radiographically.

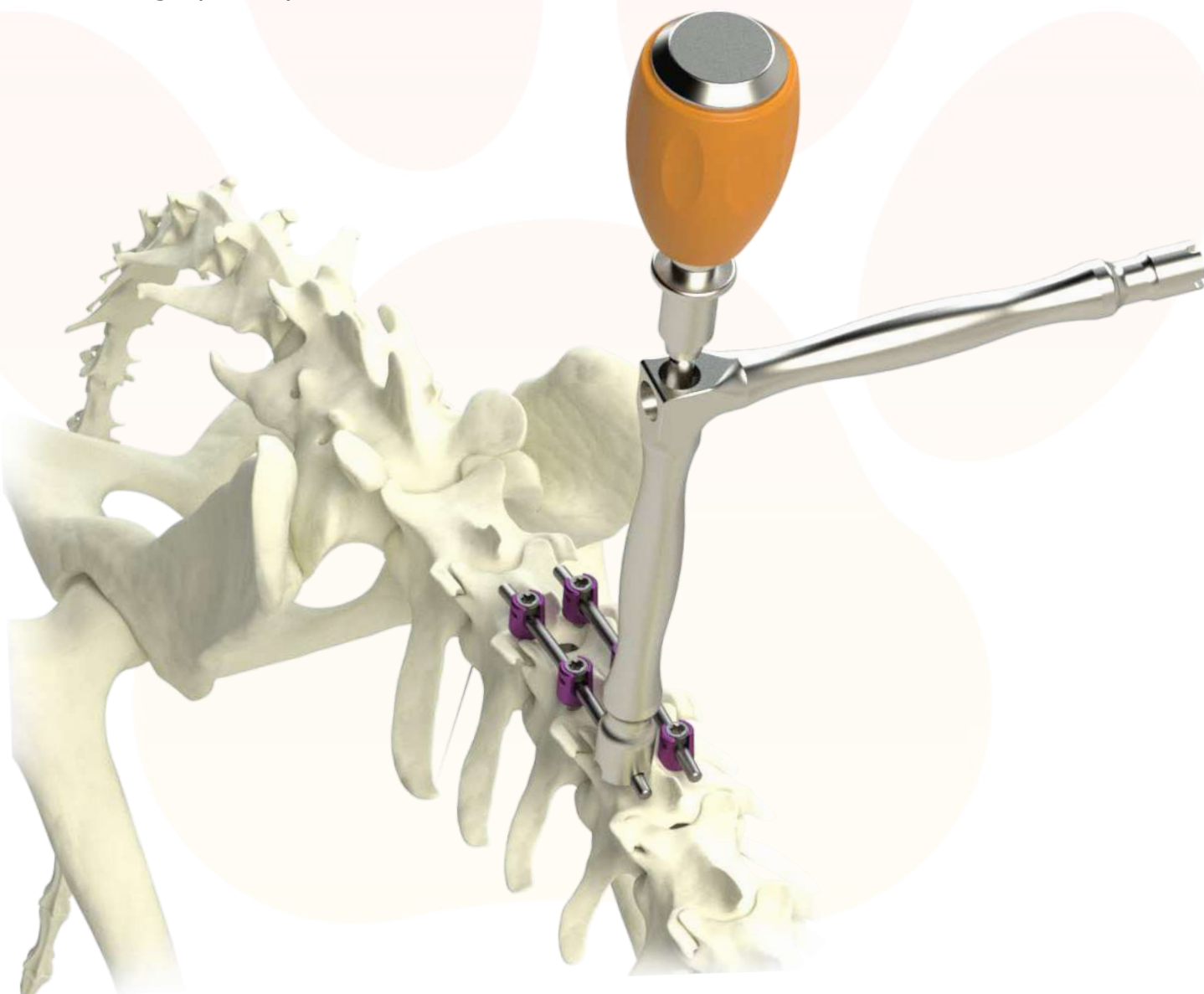


Figure 20: MTL3801/MTL3803 1/3 nm Torque Handle, MTL4100 L Anti-Torque and MTL2720/MTL2745 Set Screw Driver

6. Implant Removal

The Premium Posterior Spinal Polyaxial Screws may be removed using a **MTL3900 T Quick Coupling Handle**, **MTL2720/MTL2745 Polyaxial Screw Driver** and **MTL2720/MTL2745 Set Screw Driver**, if necessary. Insert the **MTL2720/MTL2745 Set Screw Driver** into the set screw turning counterclockwise until the set screw has been removed. The pedicle screws may be removed using the **MTL3900 T Quick Coupling Handle**, **MTL2720/MTL2745 Polyaxial Screw Driver**. Turn counter-clockwise until the desired screws have been removed.

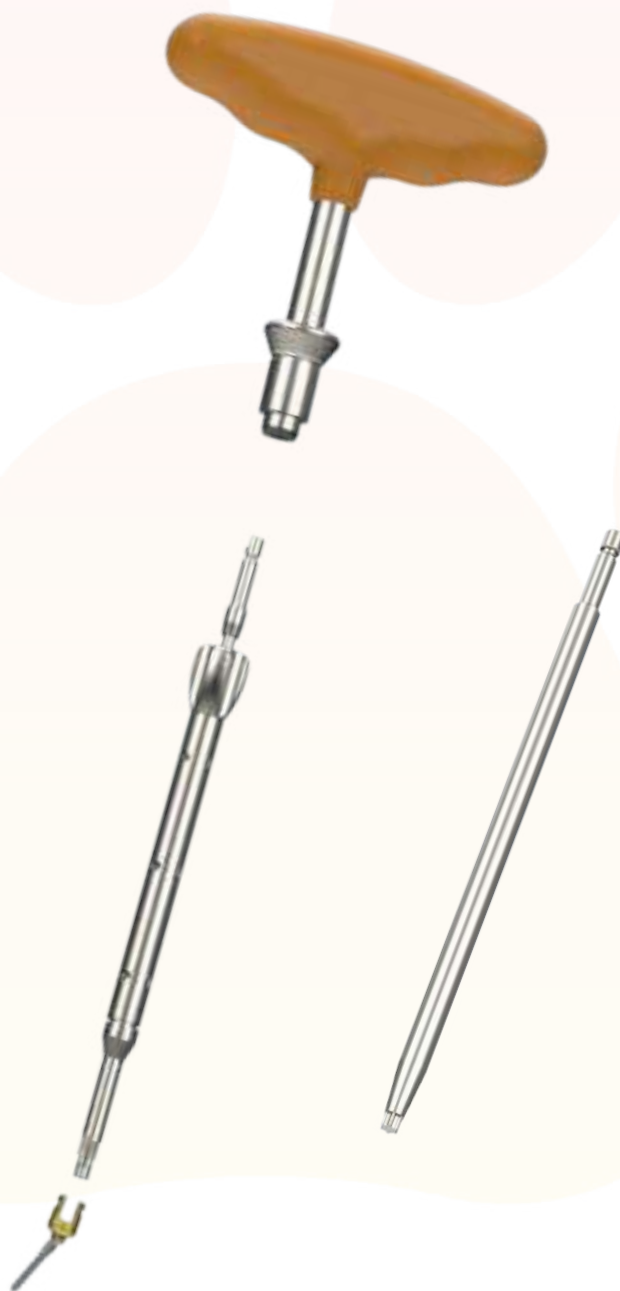
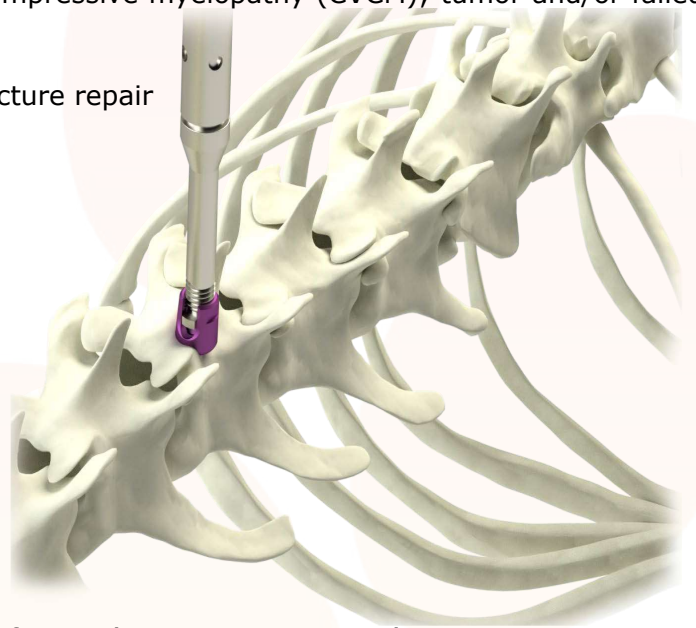


Figure 21: MTL3900 T Quick Coupling Handle, MTL2820/MTL2845 Set Screw Driver and MTL2720/MTL2745 Polyaxial Screw Driver.

7. Indications For Use

The Premium Spinal Polyaxial Screw System is intended for the following indications:

- ❖ Canine or feline posterior fixation for degenerative disc disease (defined as back pain of discogenic origin with degeneration of the disc confirmed by history and radiographic studies); spondylolisthesis; trauma (i.e., fracture or dislocation); spinal stenosis; curvatures (i.e., scoliosis, kyphosis and/or lordosis); tumor; pseudarthrosis; and/or failed previous fusion.
- ❖ Equine anterior fixation in horses for degenerative disc disease (defined as back pain of discogenic origin with degeneration of the disc confirmed by history and radiographic studies); spondylolisthesis; trauma (i.e., fracture or dislocation); spinal stenosis; curvatures (i.e., scoliosis, kyphosis and/or lordosis); cervical vertebral compressive myelopathy (CVCM); tumor and/or failed previous fusion
- ❖ Equine external mandibular stabilization for fracture repair

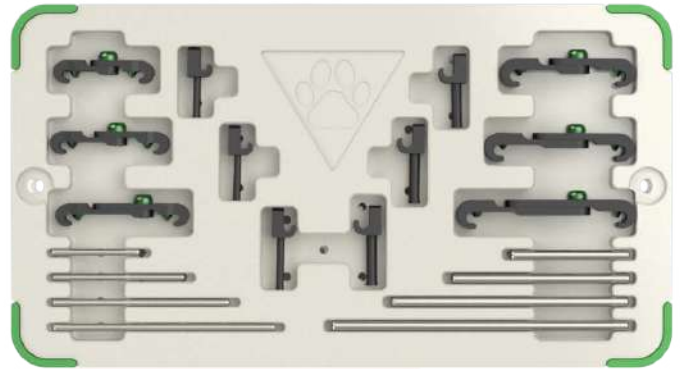
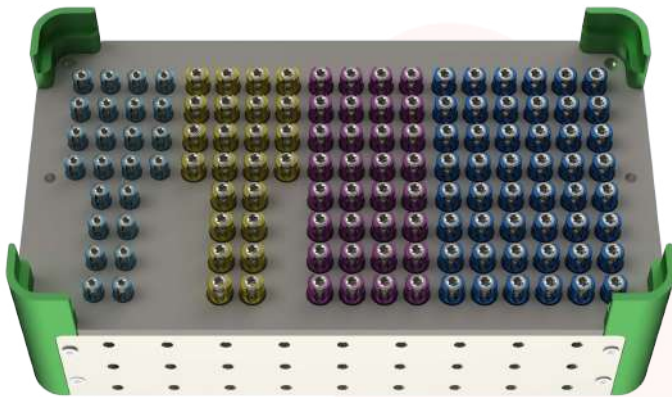


8. Contraindications

Contraindications include, but are not limited to:

- ❖ Active infectious process or significant risk of infection (immunocompromise)
- ❖ Signs of local inflammation
- ❖ Fever
- ❖ Pregnancy
- ❖ Grossly distorted anatomy caused by congenital abnormalities
- ❖ Rapid joint disease, bone absorption, osteopenia, osteomalacia and/or osteoporosis. Osteoporosis or osteopenia is a relative contraindication since this condition may limit the degree of obtainable correction, stabilization, and/or the amount of mechanical fixation
- ❖ Suspected or documented titanium metal allergy or intolerance
- ❖ Any case where the implant components selected for use would be too large or too small to achieve a successful result
- ❖ Any case that requires the mixing of metals from two different components or systems
- ❖ Any patient having inadequate tissue coverage over the operative site or inadequate bone stock or quality

Premium Posterior Spinal Polyaxial Set



Who We Are

We have nearly 40 years of combined experience in machining, and insight for the production of our medical products to treat a variety of injuries and conditions in medical sector.

We fulfill the requirements of ISO 13485 and manufacturing of medical implants (Veterinary, and Spine&Trauma Solutions).

Our Goal

Our main goal is to do our best to satisfy every customer who benefits of our products and services. We aim to do that by providing them timely, useful, and the best solutions.



Contact Us

Our team of professional veterinary experts are eagerly awaiting to offer you the assistance you need for all of your companions requirements.



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