

# Surgical Technique

## TPS™ – TL Telescopic Plate Spacer System



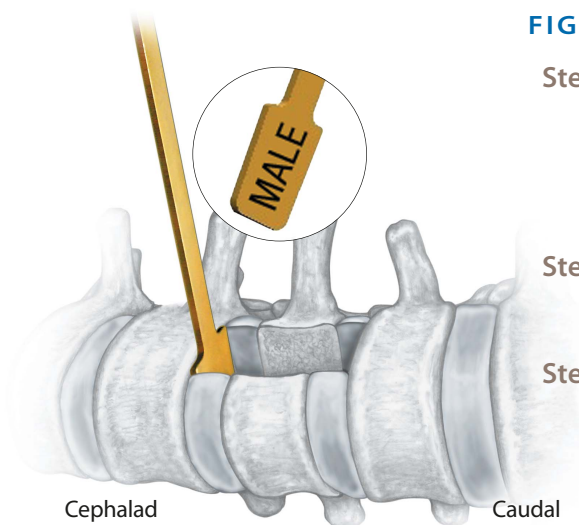
Integrated plate and spacer design

*In-situ* distraction

Convergent screw angulation for increased pull-out strength

Elimination of supplemental fixation

Substantial space for bone grafting materials



**FIG. #1**

**FIGURE #1**

**Step 1:** The decision on which side to approach the patient is based on the vascular anatomy and spinal pathology. With the patient in the lateral decubitus position, the operating table is flexed in order to increase the exposure to the pathology.

**Step 2:** Confirm alignment and surgical level with X-ray or fluoroscopy.

**Step 3:** Identify and remove the discs above and below the pathological vertebral bodies. Perform the corpectomy and neural element decompression at the involved level(s). Use the available **Templates** to gauge the depth and width of the corpectomy defect to ensure adequate size for accepting the TPS-TL device. The **Templates** have two distinct ends labeled **MALE** and **FEMALE**. Each end corresponds to its respective TPS-TL device component. The **MALE** end of the **Template** should be used in the cephalad position, while the **FEMALE** end should be used in the caudal position. Listed below is a table showing the six available TPS-TL sizes.

TPS-TL SPINAL SYSTEM  
TABLE OF IMPLANTS

Size	Width	Depth	Height Range	Screw Diameter	Color
TPS-TL 20mm x 20mm	20mm	20mm	22mm-28mm	6.0mm	Blue
TPS-TL 20mm x 20mm	20mm	20mm	28mm-38mm	6.0mm	Blue
TPS-TL 20mm x 20mm	20mm	20mm	38mm-58mm	6.0mm	Blue
TPS-TL 20mm x 35mm	20mm	35mm	28mm-38mm	7.0mm	Gold
TPS-TL 20mm x 35mm	20mm	35mm	38mm-58mm	7.0mm	Gold
TPS-TL 20mm x 35mm	20mm	35mm	58mm-100mm	7.0mm	Gold

*All implants and their associated instruments are color coded for easy identification. The 20mm x 20mm TPS-TL devices and corresponding 6.0mm bone screws are color coded **blue**. The 20mm x 35mm TPS-TL devices and corresponding 7.0mm bone screws are color coded **gold**. Color coded implants and instruments are not interchangeable. Common instruments used for either the TPS-TL 20mm x 20mm or TPS-TL 20mm x 35mm devices are not color coded.*

**Step 4:** Remove the cartilaginous endplates, and carefully prepare the cortical endplates of the adjacent vertebrae for receiving the TPS-TL device. The endplate surfaces should be prepared to be flat and parallel to receive the implant.

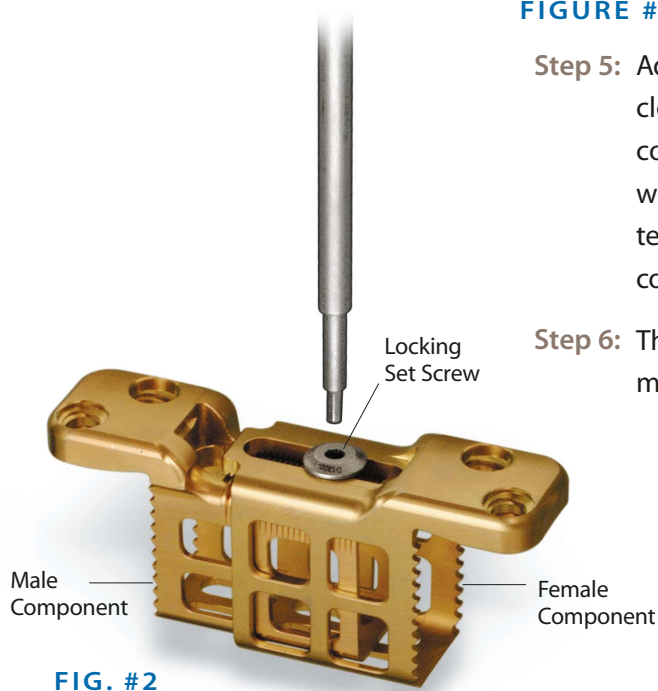


FIG. #2

#### FIGURE #2

**Step 5:** Adjust the male and female components to a length which closely approximates the rostro-caudal dimension of the corpectomy defect and provisionally tighten the set screw with the *Bone Screw Driver*. The set screw will draw the teeth of the male component to the teeth of the female component, maintaining the desired implant length.

**Step 6:** The TPS-TL implant should be packed with bone graft material prior to implantation.

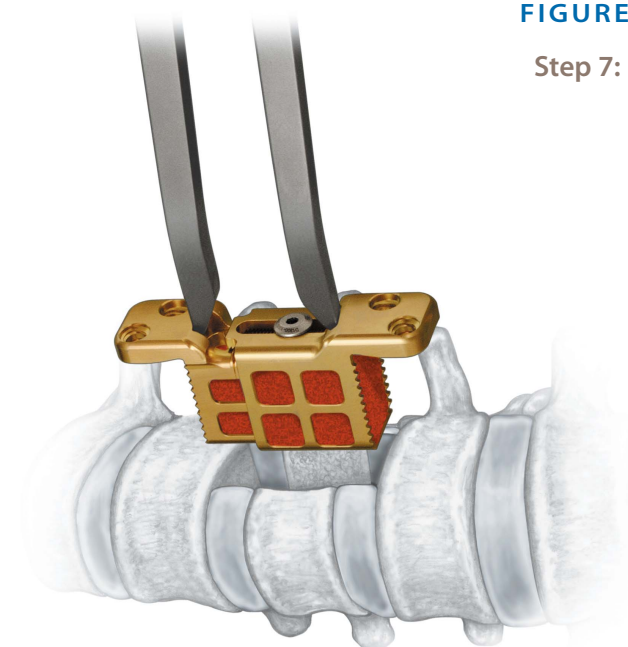


FIG. #3

#### FIGURE #3

**Step 7:** Place the *Distractor Tips* into the TPS-TL distractor slots, and turn the distractor handle to apply a minimum load on the TPS-TL device to hold it in position on the distractor tips. Using the *Distractor* as an inserter, place the TPS-TL implant into the corpectomy defect with the male component in the cephalad position. With a mallet and tamp, firmly seat the TPS-TL into the corpectomy defect. Verify that the TPS-TL implant is fully seated with the cephalad and caudal plate components flush against the lateral aspect of the vertebral bodies.

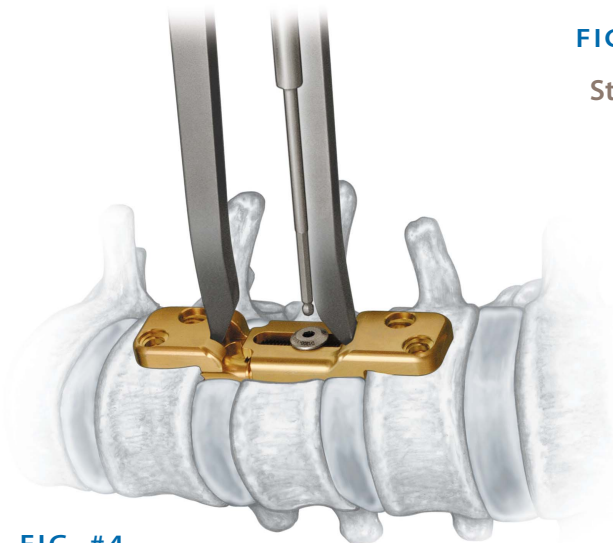


FIG. #4

**FIGURE #4**

**Step 8:** Loosen the set screw for distraction using the **Ball-Tip Hex Screw Driver**. Distract the device to achieve compression between the implant and the adjacent vertebral endplates. For additional torque, the **T-Wrench** (handle) may be placed on the **Distractor** handle. Continue distraction until the desired physiologic spinal contour is restored. Firmly tighten the set screw using the **Bone Screw Driver** to maintain the desired length of the TPS-TL implant.

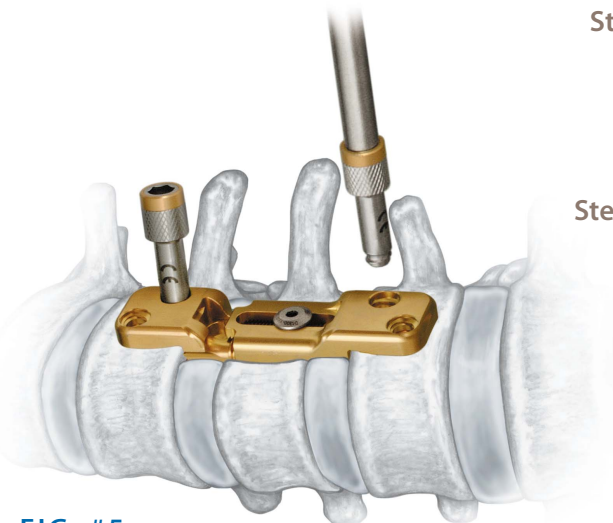


FIG. #5

**FIGURE #5**

**Step 9:** Neutralize the operating table to achieve further compression of the implant. Intraoperative radiographs should be obtained to ensure proper spinal alignment and implant position.

**Step 10:** Place the color coded **Threaded Drill Guide(s)** onto the **Drill Guide Applicator** (Curved or Straight). Insert the **Threaded Drill Guides** into the posterior holes on the TPS-TL implant using the **Drill Guide Applicator**. The **Threaded Drill Guide** ensures the correct alignment of the drill relative to the device and assures proper convergent screw trajectory.

*Note: The Threaded Drill Guides may be pre-assembled on the implant prior to implantation.*

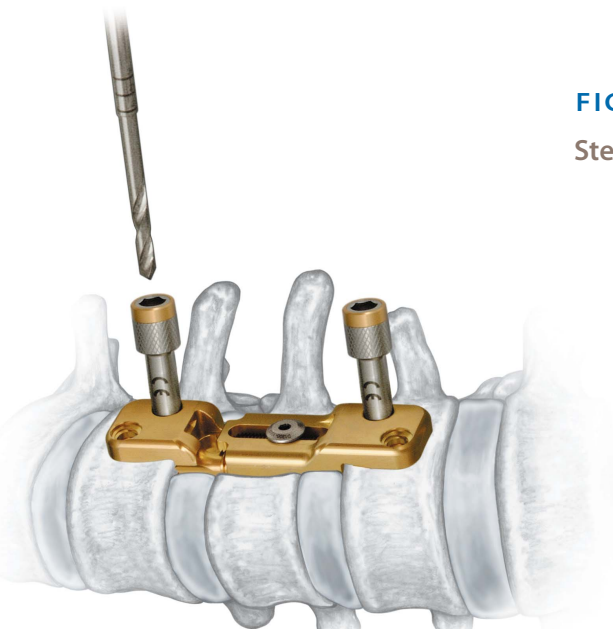


FIG. #6

**FIGURE #6**

**Step 11:** **Drills** are provided in various lengths with Z-Connect Fittings to attach to handles. All drills are color coded and feature markings to indicate depth. The Etching on the drill indicates depth when the number corresponding to the desired depth matches up with the head of the **Drill Guide**. To drill a hole, select the appropriate color coded drill, place it into the **Ratcheting Handle Z-Connect** or power drill and drill the hole through the **Threaded Drill Guide**. Screw purchase may be uni- or bi-cortical, depending on surgeon preference.

*Note: The Straight Drill or the Flexible Drill may be used for this procedure.*

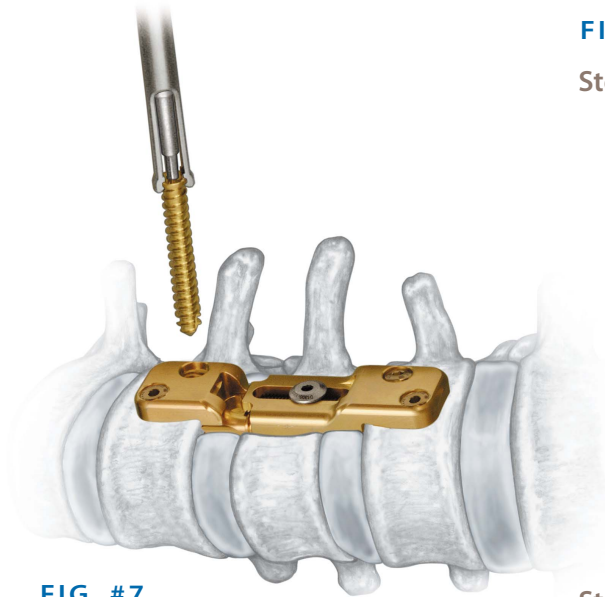


FIG. #7

**FIGURE #7**

**Step 12:** After drilling, remove the *Threaded Drill Guide* with the *Drill Guide Applicator*. Load the appropriate color coded Titanium Locking Bone Screw onto the pre-assembled *Bone Screw Holder* and *Bone Screw Driver* and insert the screw into the TPS-TL implant. Special care should be taken to properly align the screw along the drilled trajectory during screw insertion into the implant. Tighten the screws until the locking threads on the screw heads are fully engaged in the TPS-TL device and the screw heads are flush with the top surface.

*Note: The Universal Joint Bone Screw Driver may be used in situations where access to the bone screws is difficult utilizing the straight bone screw driver.*

**Step 13:** Repeat this procedure for the other posterior screw.

**Step 14:** Insert the appropriate color coded *Threaded Drill Guide(s)* into the anterior holes using the *Drill Guide Applicator* (Curved or Straight). Drill one anterior hole through the *Threaded Drill Guide* using the appropriate color coded *Drill* with stop as before. Repeat the process of bone screw insertion as described previously with the posterior screws. When properly seated, the TPS-TL device has a profile of less than 5.5mm.

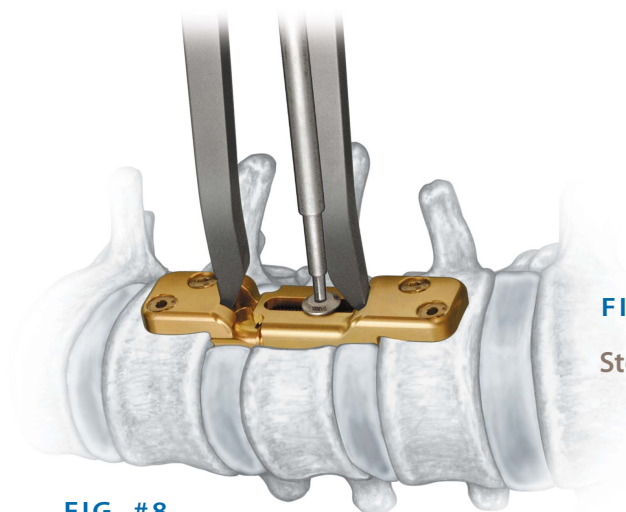


FIG. #8

**FIGURE #8**

**Step 15:** After all screws have been secured, utilize the *Torque Limiting T-Handle* in conjunction with the *Bone Screw Driver* for final tightening of the locking set screw and bone screws. To prevent injury to the spine, use the distractor as a counter-torque device. The *Torque Limiting T-Handle* will provide a locking torque of 80 in-lb or 9N-m.

*Note: Do not use the Ball-Tip Hex Screw Driver for final tightening, as this may damage the screw head and instrument.*

**Step 16:** Obtain intraoperative radiographs to verify satisfactory screw placement.

**FIGURE #9**

**Step 17:** Pack additional bone graft material into the device through the hole and slot on the top surface of the TPS-TL device, utilizing the provided *Graft Funnel* and *Graft Tamp*. Additional bone graft material may be packed around the implant.

**Step 18:** Perform standard multi-layer wound closure.

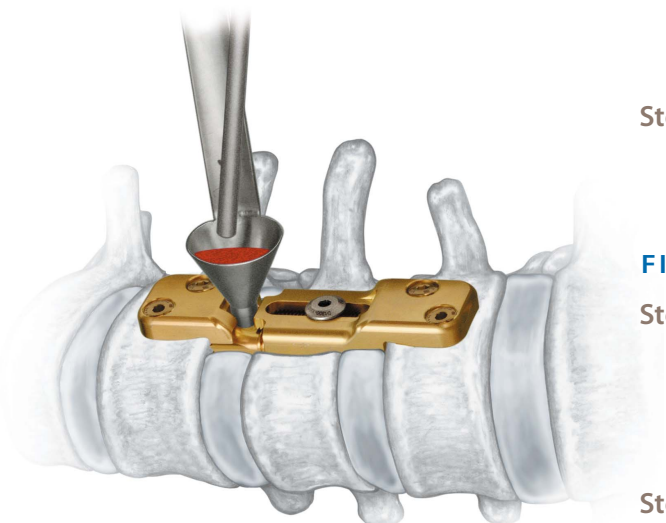
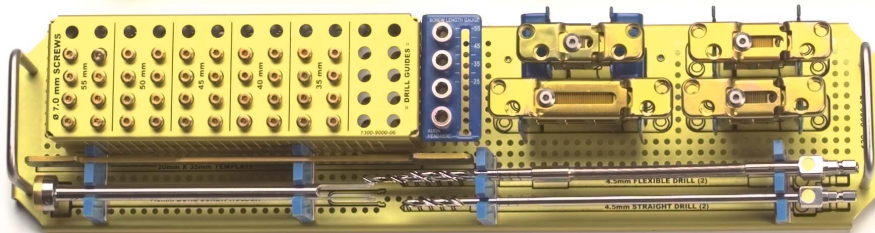
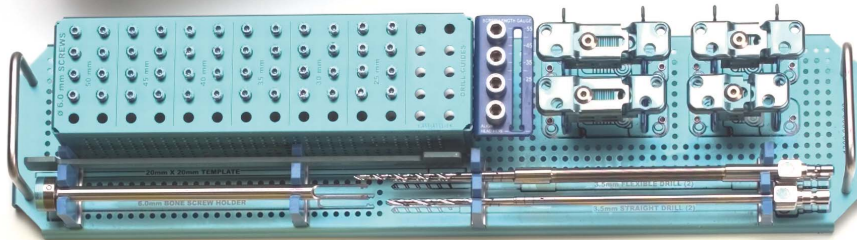
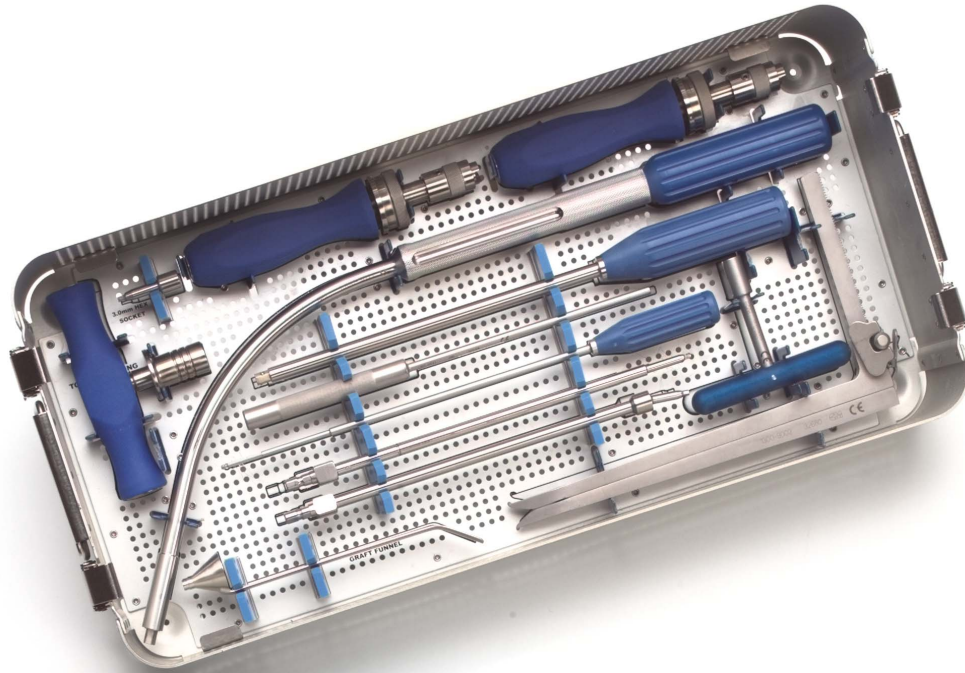


FIG. #9



*The TPS™-TL Instrument Tray contains four 20mm x 20mm implants  
and four 20mm x 35mm implants.  
Each tray component is color-coded for easy identification in the OR.  
Please note that color-coded implants and instruments are not interchangeable.*