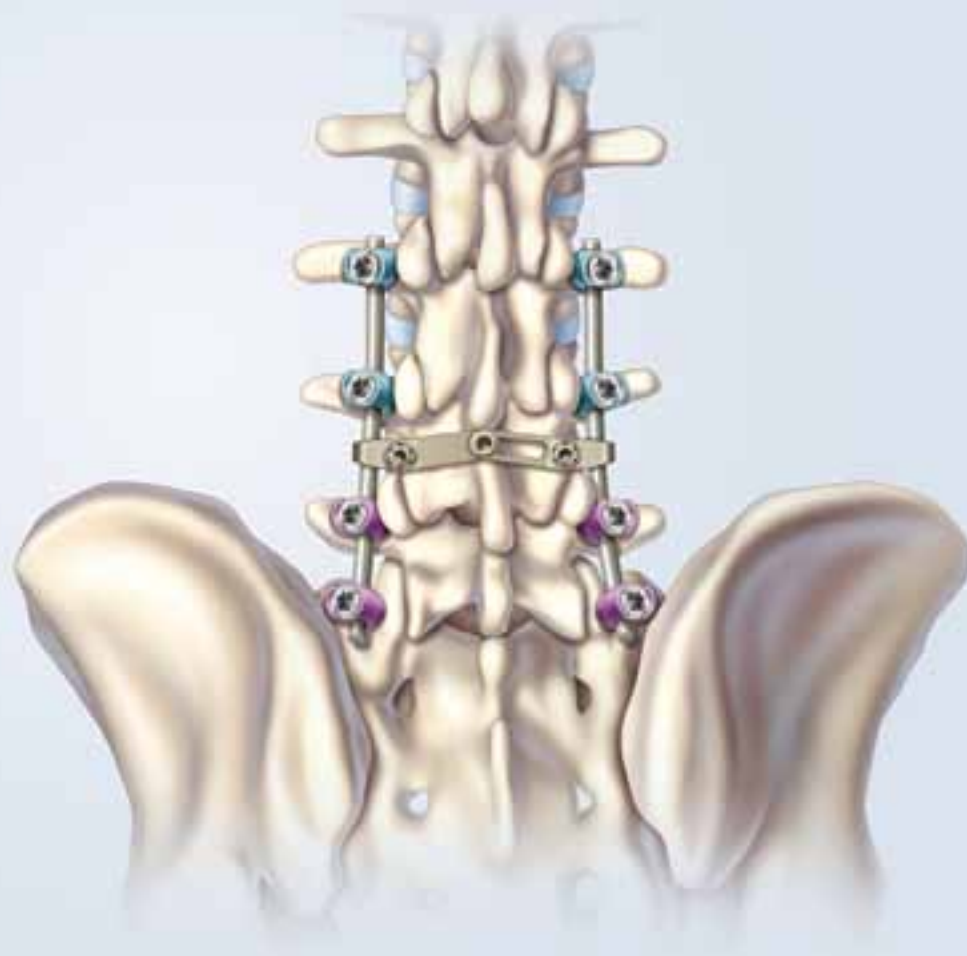


S⁴[®] Spinal System

Surgical Technique



Aesculap Spine

AESCULAP[®]
Implant Systems

S⁴[®] Spinal System

Surgical Technique

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I. System Overview



The S⁴ Spine System is a top-loading, low profile "tabbed" thoracolumbar pedicle fixation system that is designed to address complex posterior spine pathologies. The S⁴ system features a sophisticated pressure vessel locking design capable of delivering biomechanical stability while maintaining an ultra-low profile.

The S⁴ Spine System offers a broad selection of implants and instruments that are designed to meet the surgeons' demand for a quicker yet simpler surgical procedure. The trays are configured to include polyaxial screws, monoaxial screws, pre-cut straight and pre-bent rods, rigid & adjustable cross connectors, and a variety of rod-to-rod connectors.

System Features & Advantages

- Small Implant Volume
 - Maximize screw head range of motion
 - Reduce the risk of facet and soft tissue impingement
- Patented Interlocking Thread Design
 - Minimize splaying of screw body
- Pressure Vessel Technology
 - Transfer energy throughout the polyaxial screw construct transforming it into a solid monoaxial construct, achieving maximum construct stability.
- Undercut Thread Design
 - Help eliminate cross threading by directing the force inward, improving force transmission and efficiency throughout the rod-screw construct.



Specialty Instrumentations

The S⁴ system is also compatible with specialty instrumentations that are anatomically designed to address Spondylolisthesis and fracture reduction needs in a controlled and precise manner.



S⁴ SRI

- Only spondylolisthesis reduction solution that allows for simultaneous translational and rotational correction with a single-level fusion to spare adjacent healthy vertebrae.
- Precise and controlled reduction maneuver lowers the risk of inadvertent or potentially damaging movements.



S⁴ FRI

- Distraction, reduction and curvature correction in all planes is accomplished with precision and control
- Complex spine and revision cases are made easier through the ability to extend or revise the construct, using the S⁴ pedicle screw and connectors.

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II. Indications and Contraindications

The S⁴ Spinal System is intended for anterior/anterolateral and posterior, non-cervical pedicle and non-pedicle fixation. Fixation is limited to skeletally mature patients and is intended to be used as an adjunct to fusion using autograft or allograft. The device is indicated for treatment of the following acute and chronic instabilities or deformities:

1. Degenerative disc disease (defined as discogenic back pain with degeneration of the disc confirmed by history and radiographic studies),
2. Spondylolisthesis,
3. Trauma (i.e., fracture or dislocation),
4. Spinal Stenosis,
5. Deformities or Curvatures (i.e., scoliosis, kyphosis, and/or lordosis),
6. Tumor,
7. Pseudoarthrosis, and
8. Failed previous fusion

Contraindications

Contraindications of the S⁴ Spinal System are similar to other commercially available posterior spinal fixation systems of similar design and material. Contraindications include, but are not limited to, the following:

1. Use in the Cervical Spine
2. Active systemic or local infection
3. Obesity
4. Pregnancy
5. Mental illness
6. Severe osteoporosis or osteopenia
7. Metal sensitivity/ allergies to the implant material
8. Alcohol or drug abuse
9. Patients unwilling or unable to follow postoperative instructions
10. Neuromuscular diseases/ disorders
11. Soft tissue deficit not allowing wound closure
12. Any medical or physical condition that would preclude the potential benefit of spinal implant surgery
13. Congenital abnormalities, tumors or other conditions that would prevent secure component fixation that has the potential to decrease the useful life of the device.
14. Any medical or mental condition which would exclude the patient or put the patient at high risk from surgery of this severity.
15. For pedicle screw cases, inadequate pedicles of the fifth lumbar (L5) vertebrae.

Complications and possible adverse effects

Prior to surgery, patients should be made aware of the following possible adverse effects in addition to the potential for additional surgery to correct these effects:

1. Loosening, disassembly, bending or breakage of components
2. Tissue sensitivity to implant material
3. Potential for skin breakdown and/ or wound complications
4. Non-union or delayed union
5. Infection
6. Nerve damage, including loss of neurologic function, dural tears, paralysis, paresthesia, and cerebral spinal fluid leakage
7. Fracture of vertebrae
8. Infection
9. Loss of fixation
10. Vascular or visceral injury
11. Chance of normal spinal curvature
12. Gastrointestinal, urological and/ or reproductive system compromise
13. Pain or discomfort
14. Bursitis
15. Decrease in bone density due to stress shielding
16. Loss of bone or fracture of bone above or below the level of surgery
17. Bone graft donor site pain, fracture, and/ or delayed wound healing
18. Restriction of activities
19. Lack of effective treatment of symptoms for which the surgery was intended
20. Death

III. Warnings and Precautions

Cautions/Precautions & Warnings

- No component of the S⁴ Spinal System should be reused after being removed from the body. An implant should never be re-sterilized after contact with body tissues or body fluids.
- Damage to the implant can occur if the clamping screw is overtightened. Do not tighten the clamping screw without using the counteracting instrument or screw head expansion can occur.
- Damage to the implant can occur when implant set screw is over torqued.
- Damage to the implant can occur if the repositioning instruments are positioned too high in relation to the implant. Always apply repositioning instruments (e.g. distraction and compression forceps) below the rod at the implant.
- During derotation, screw head expansion may occur if derotation sleeves are not used.
- The implant can be damaged by spondylolisthesis repositioning through the clamping screw. Always use the rod persuader for spondylolisthesis repositioning.
- This system should only be used with instrumentation specifically designed for this system and the surgeon should be familiar with the surgical technique.

PRECAUTION

The S⁴ system has not been evaluated for safety and compatibility in the MR environment. The S⁴ system has not been tested for heating or migration in the MR environment.

PRECAUTION

Components of competitive spinal fixation systems should not be used with components of the S⁴ Spinal System. Components of dissimilar material should not be used together due to the potential for accelerating the corrosion process by mixing of dissimilar materials.

PRECAUTION

The implantation of pedicle screw spinal systems should be performed only by experienced spinal surgeons with specific training in the use of this pedicle screw spinal system because this is a technically demanding procedure presenting a risk of serious injury to the patient.

PRECAUTION

Based on the fatigue testing results, the physician/surgeon should consider the levels of implantation, patient weight, patient activity level, other patient conditions, etc. which may affect the performance of the system.

WARNING

The safety and effectiveness of pedicle screw spinal systems have been established only for spinal conditions with significant mechanical instability or deformity requiring fusion with instrumentation. These conditions are significant mechanical instability or deformity of the thoracic, lumbar, and sacral spine secondary to degenerative spondylolisthesis with objective evidence of neurological impairment, fracture, dislocation, scoliosis, kyphosis, spinal tumor, and failed previous fusion (pseudarthrosis). The safety and effectiveness of these devices for any other conditions are unknown.

WARNING

The S⁴ Spinal System is not intended to be used without bone graft which is required to provide additional spinal support. Use of this product without bone graft or in cases that develop into a non-union will eventually be unsuccessful. A successful result is not always achieved in every surgical case. No posterior spinal fixation system can withstand body loads without the support of bone. In the event that bone is not provided to facilitate fusion, bending, loosening, disassembling, and/ or breakage of the implant will eventually occur.

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IV. Surgical Technique

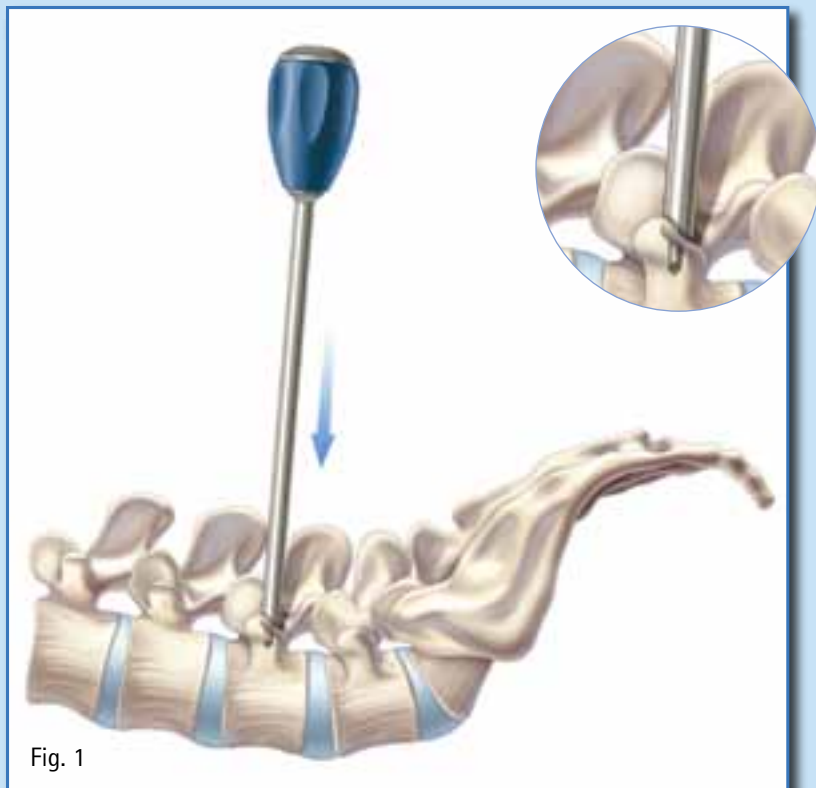


Fig. 1

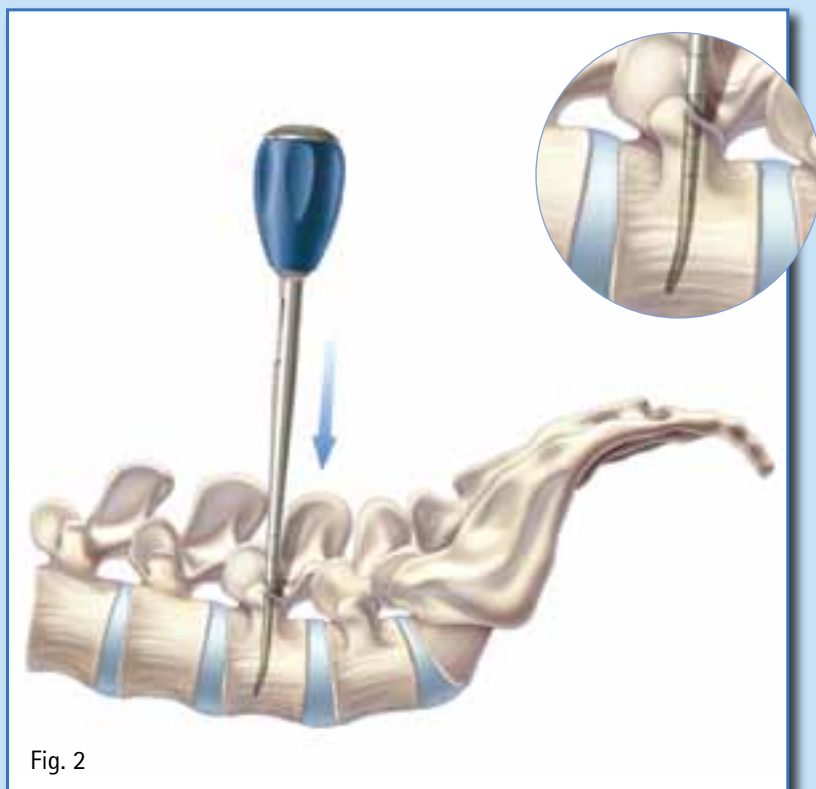


Fig. 2

1. Pedicle Preparation

- Determine pedicle entry point and perforate the cortex using the bone awl (FW190R). (Fig. 1)

- Use the pedicle probe to open the pedicle canal. (Fig. 2)
 - The pedicle probes are available in straight or curved blunt-tip (FW188R or FW189R) and straight or curved Lenke (FW248R or FW249R).
 - The probes have ruled markings to determine the depth measurement in the pedicle canal.

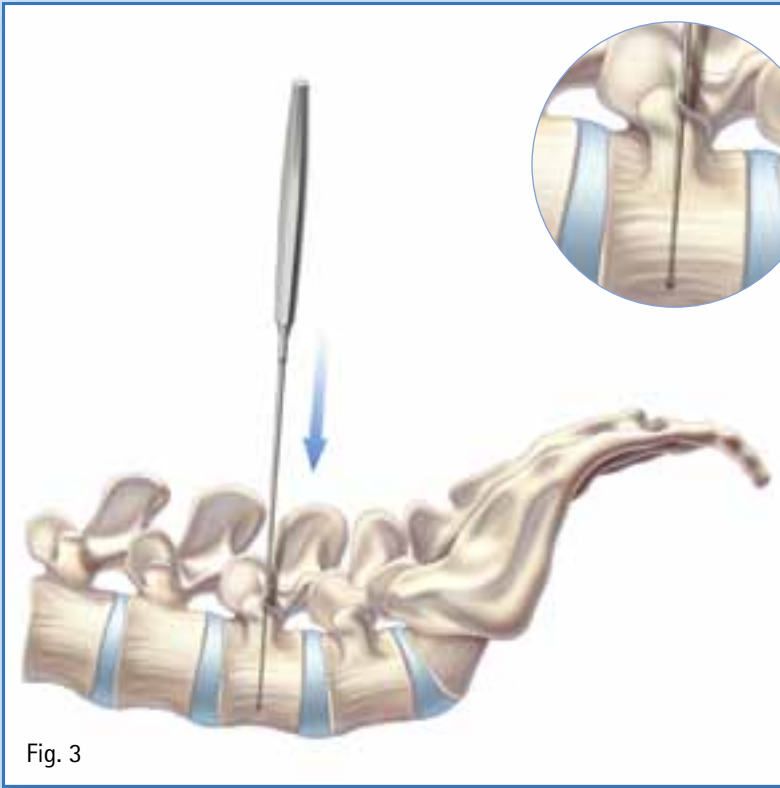


Fig. 3

- Utilize the straight or curved pedicle sounder (FW146R or FW147R) to confirm the patency of the pedicle and vertebral body cortex. (Fig. 3)

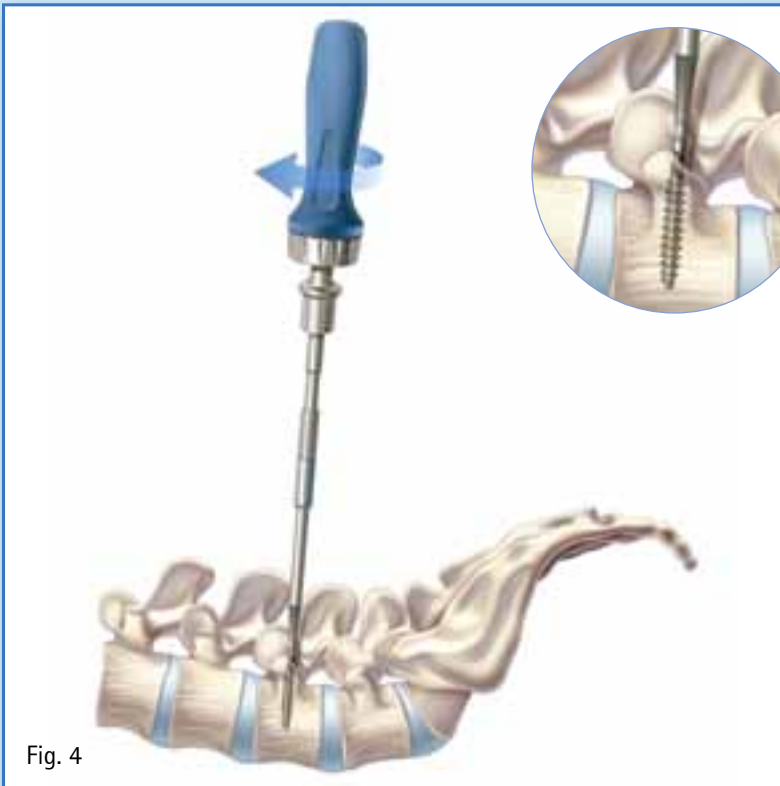


Fig. 4

2. Tapping (Optional)

Although the S⁴® Spine System screws are self-tapping, screw taps are available in all diameters, if desired.

- To tap, attach the ratchet handle or the T-handle (ME175R or FW167R) to the appropriate tap based on the screw diameter. **Refer to page 32 for a complete list of taps sizes.** (Fig. 4)

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Fig. 5

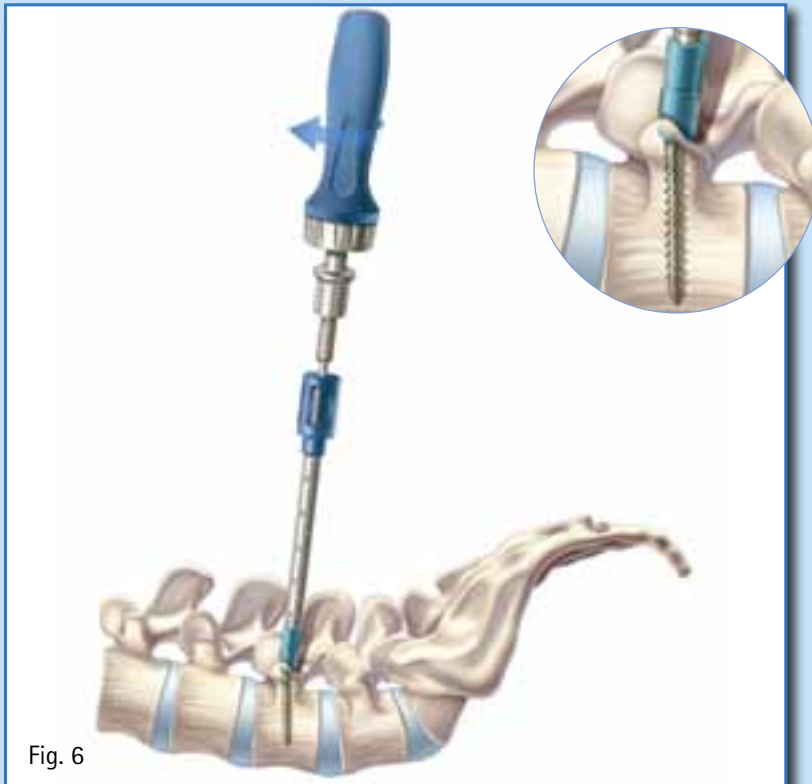


Fig. 6

3. Screw Application

Color-coded polyaxial and monoaxial screws are available in various lengths and diameters. **Refer to pages 28–30 for a complete list of implant sizes.**

- Select the appropriate screwdriver based on the screw style.
 - For polyaxial screws either use the self-retaining polyaxial screwdriver (FW173R) or the rigid fixation screw driver (FW156R).
 - For monoaxial screws, use the rounded tip monoaxial screw driver (FW176R).

a) Polyaxial Screw Application

- Attach and fully engage the hexagonal tip of the polyaxial screwdriver into the head of the screw.
- If using the rigid fixation screwdriver, engage the hexagonal tip and then rotate the twist knob in a clockwise fashion while holding the bone screw to lock the threaded end of the screwdriver into the screw head as shown in (Fig. 5).

Note: *If the polyaxicity of the screw remains, the screw is not fully engaged.*

Caution: *Ensure that the screwdriver is fully engaged and threaded onto the screw.*

- Thread the screw into the prepared pedicle (Fig. 6) and release the screwdriver from the head of the screw.

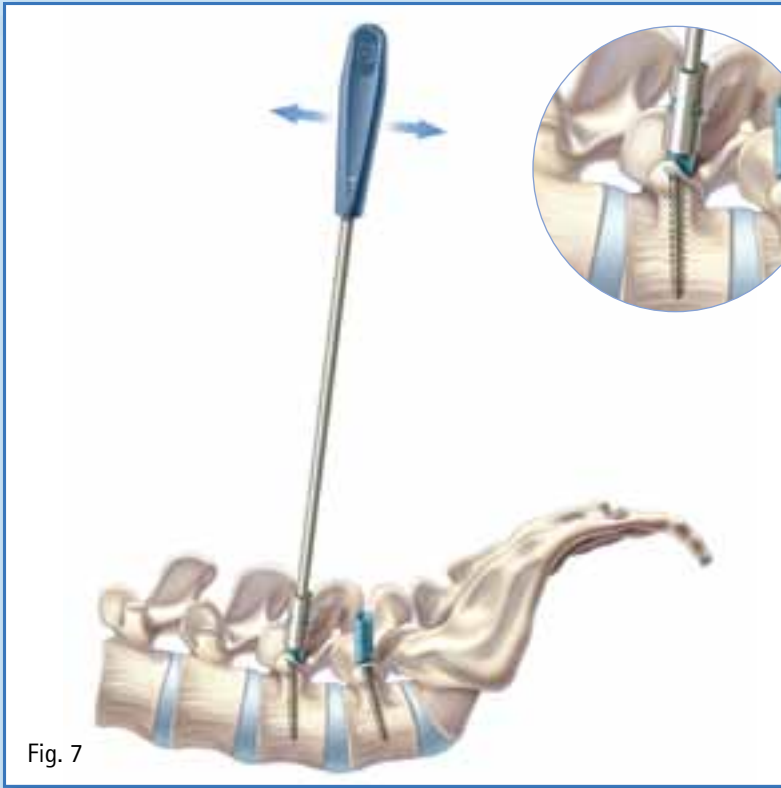


Fig. 7

- All polyaxial screw heads have 42° range of motion. If desired, align the polyaxial screw bodies using the screw body manipulator (FW180R). (Fig. 7)

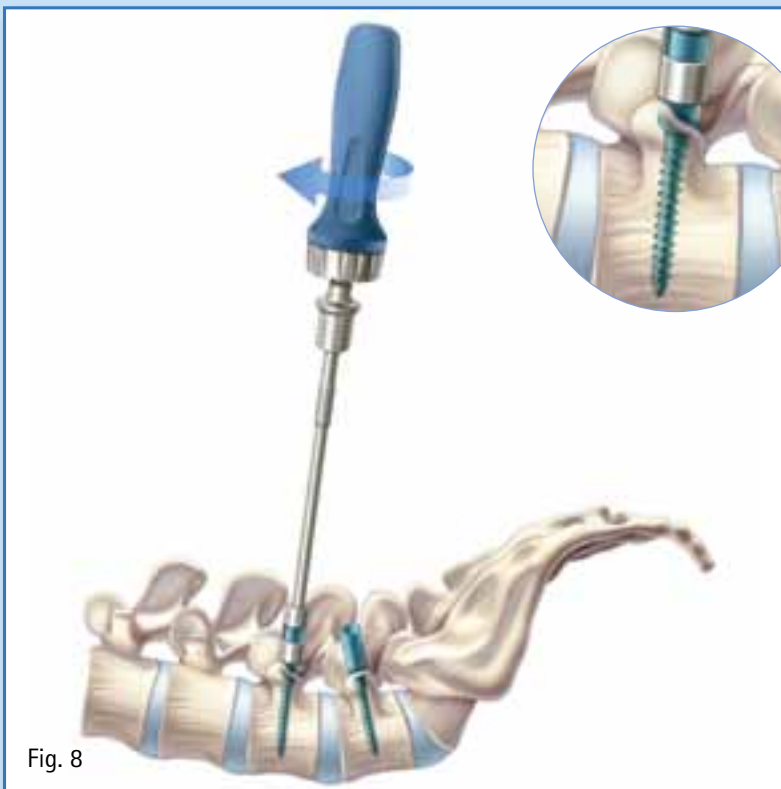


Fig. 8

b) Monoaxial Screw Application

- Insert and fully seat the rounded tip of the monoaxial screwdriver into the slot of the monoaxial screw then thread the screw into the prepared pedicle. (Fig. 8)

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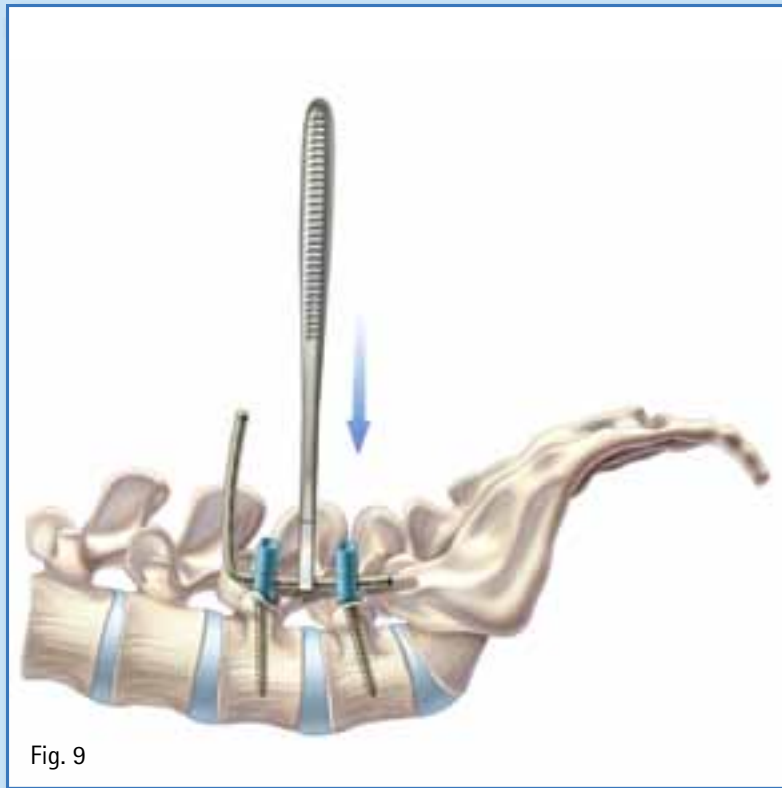


Fig. 9

4. Rod Placement

- Use the flexible rod trails (FW185R) as a guide for rod bending and measuring correct rod length. (Fig. 9)

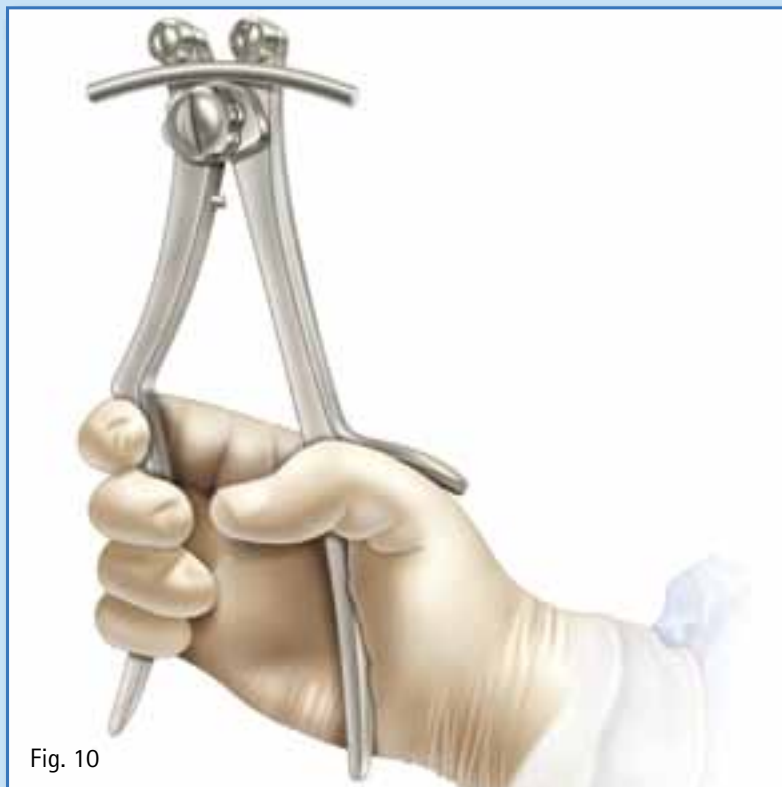


Fig. 10

Both pre-bent and straight rods are available.

- All rods may be contoured using the French rod bender (FW024R).
- To contour the rod, place rod on the bender and squeeze the handle until the desired curvature is achieved. (Fig. 10)

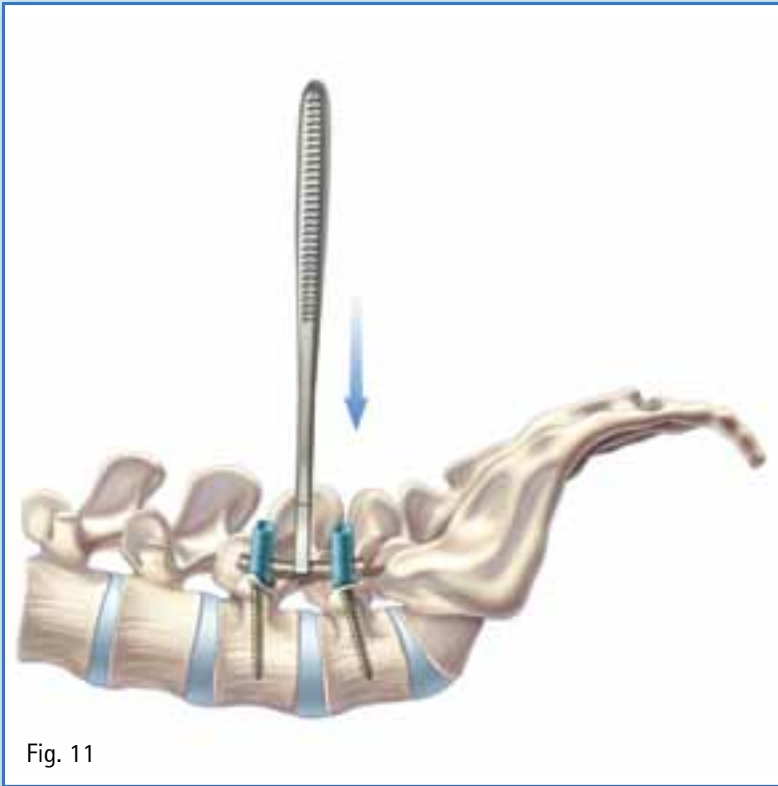


Fig. 11

- Use the rod holding forceps (FW012R) to assist with rod placement or rod manipulation. (Fig. 11)

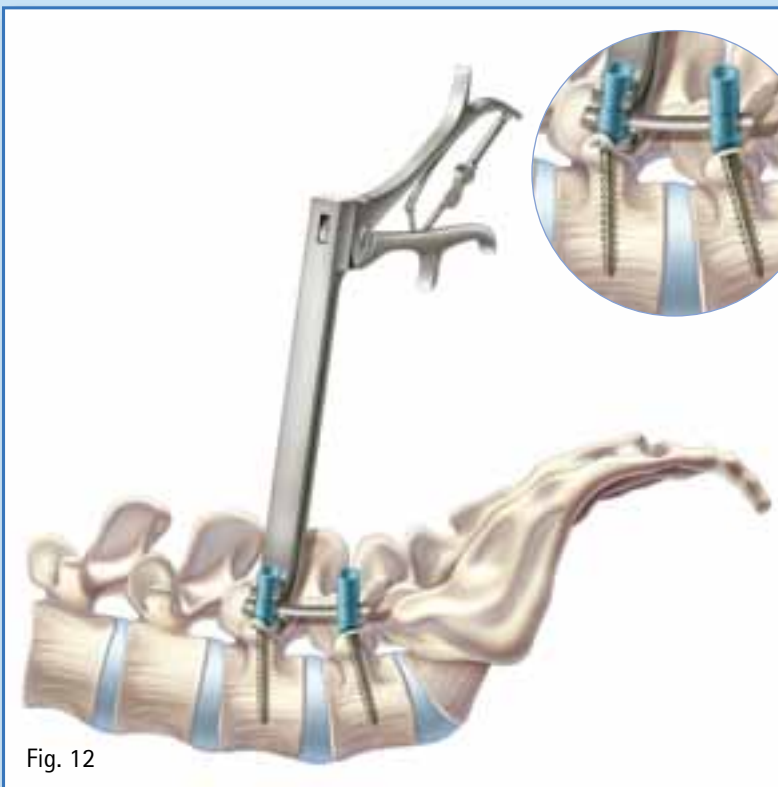


Fig. 12

5. Rod Reduction (Optional)

The rod persuader (FW208R) can be used to help seat the rod fully into the saddle of the screw in multilevel cases. Using the rod persuader also simplifies set screw placement.

- Place the rod persuader on the screw head so that rod is fully engaged.
- Squeeze the handle to seat the rod into the head of the screw. The ratchet will hold the rod persuader in the reduced position while the set screw is applied. (Fig. 12)

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Fig. 13

6. Set Screw Application

- Insert the dual ended or handled set screw starter (FW279R or FW251R) firmly into the set screw and remove the set screw from the caddy. (Fig. 13)

Note: *The set screw must be fully engaged to the set screw starter.*

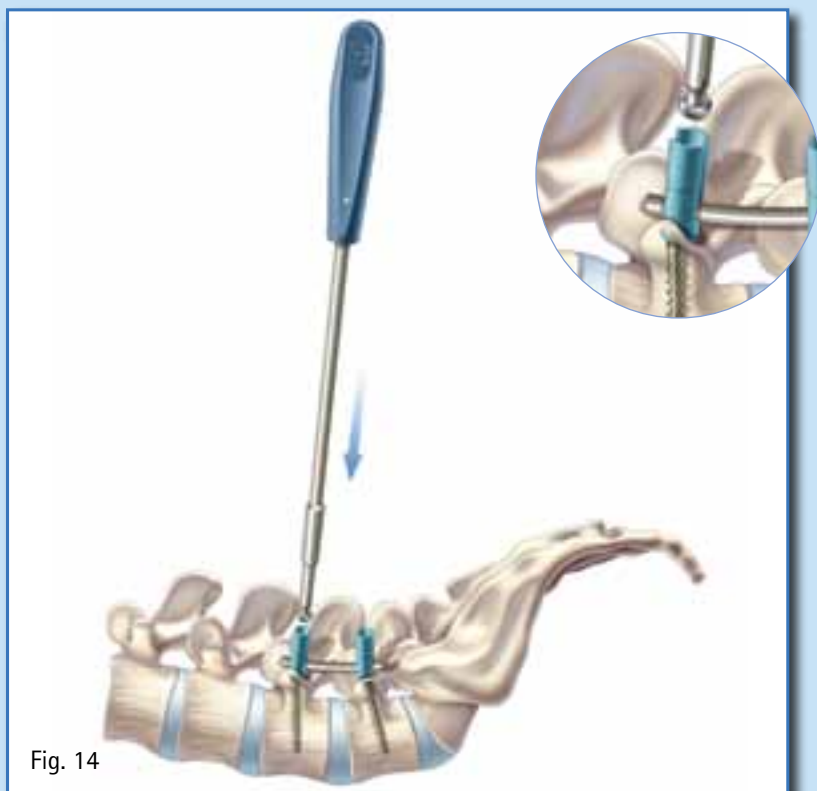


Fig. 14

- Finger tighten the set screw into the screw body until it contacts the rod. (Fig. 14)

Caution: *The set screw starter is not designed for final tightening of the construct. It is designed to only tighten to a depth that still allows compression and distraction maneuvers to be performed.*

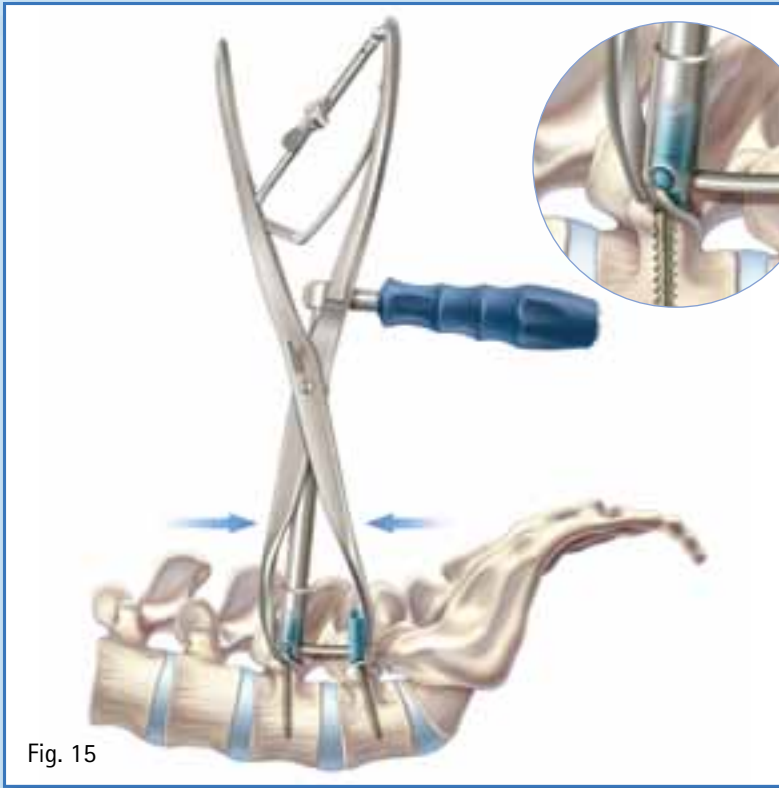


Fig. 15

7. Compression Maneuver

Use the compression forceps (FW282R) to compress the construct. (Fig. 15)

- Fully tighten one set screw to create a fixed point for compression **(as described in section 10 page 15)**.
- Fully seat the counter torque L-handle (FW178R) or the derotation sleeves on the unlocked screw body and perform the compression maneuver
- Once the desired compression is achieved, final tighten the remaining set screw.

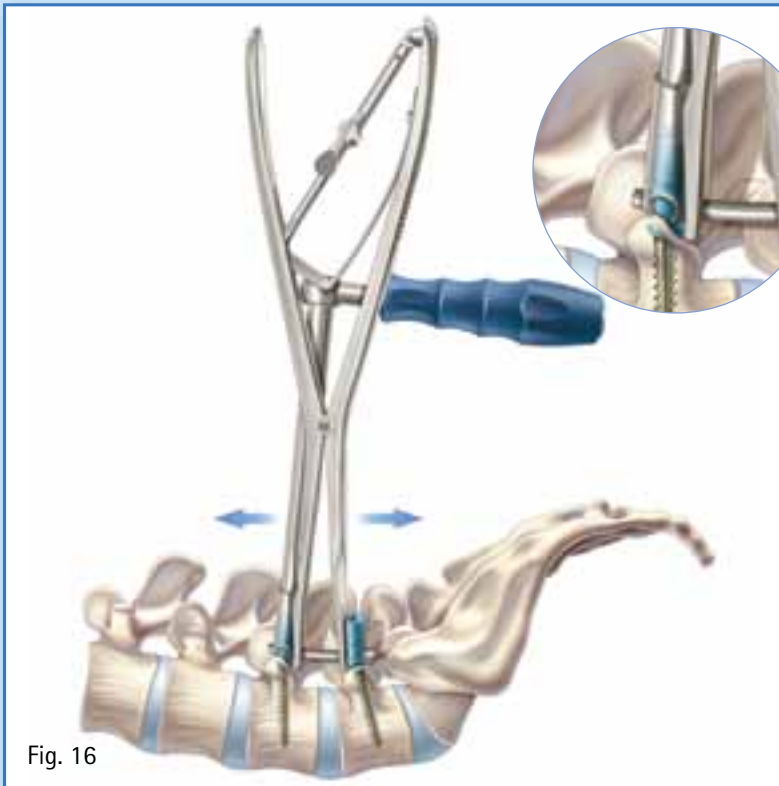


Fig. 16

8. Distraction Maneuver

Use the distraction forceps (FW281R) to distract the construct. (Fig. 16)

- Fully tighten one set screw to create a fixed point for distraction **(as described in section 10 page 15)**.
- Fully seat the counter torque L-handle (FW178R) or the derotation sleeves on the unlocked screw body and perform the distraction maneuver
- Once the desired distraction is achieved, final tighten the remaining set screw.

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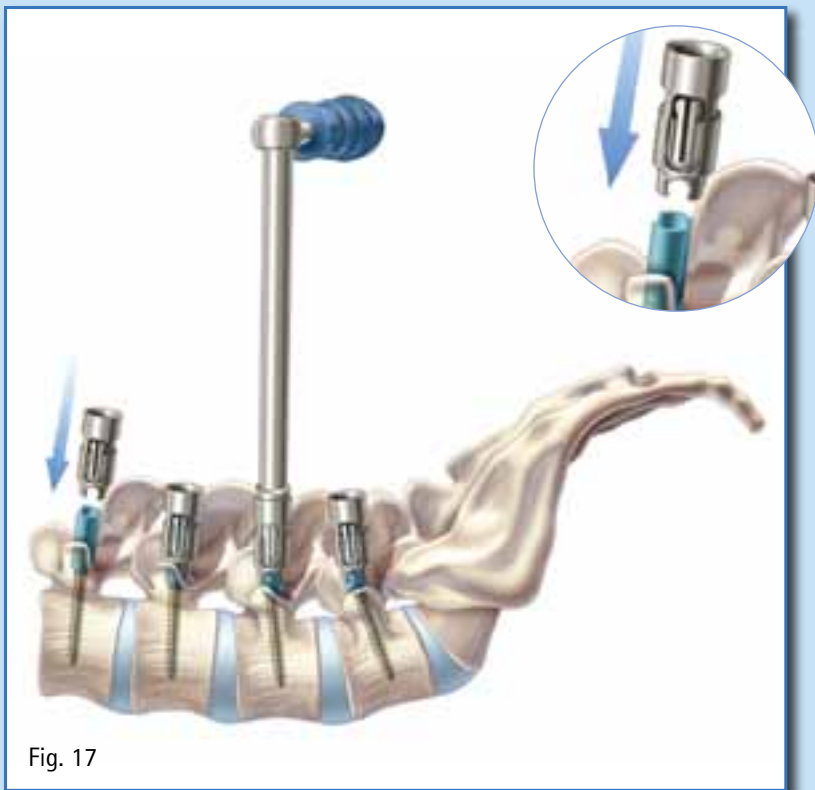


Fig. 17

9. Derotation Maneuver

Use the derotation sleeves (FW183R) and the counter torque L-handle to rotate the rod. (Fig. 17)

- Place the derotation sleeves over the pedicle screws that contain the rod to be rotated
- Connect the counter torque L-handle to one of the derotation sleeves to perform the rotation maneuver.
- Once the desired rotation is achieved, fully tighten the set screws (as described in section 10, page 15).

Caution: *The derotation sleeves should be used during rotation maneuvers to prevent splaying of the implant head.*

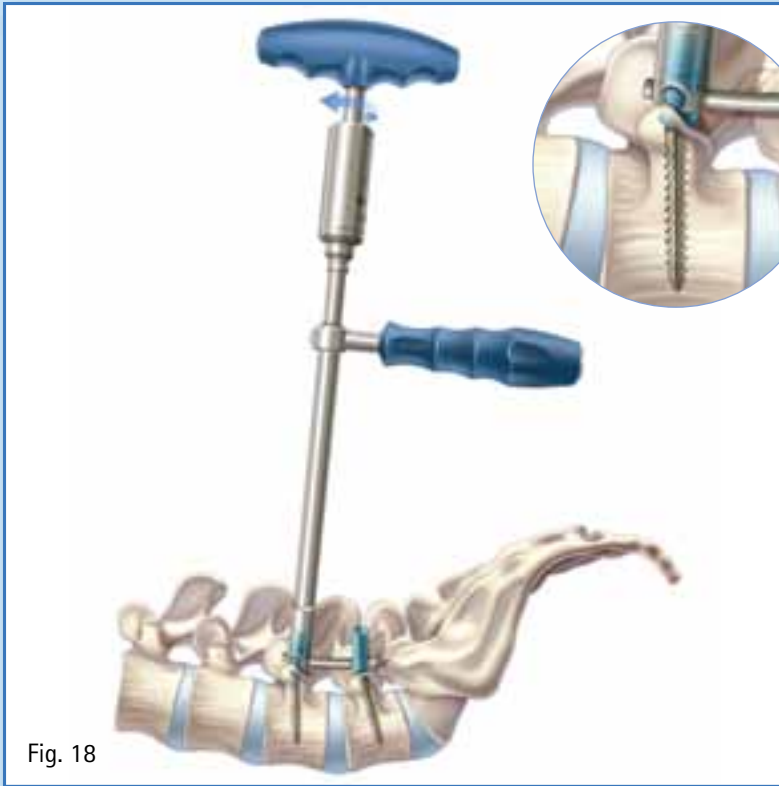


Fig. 18

10. Final Tightening

Final tightening of each set screw is completed using the clicking torque wrench or the line-to-line torque (FW150R or FW170R) wrench along with the counter torque L-handle (FW178R). (Fig. 18)

- Insert the clicking torque wrench through the tube of the counter torque so the tip is exposed.
- Fully seat the tip of the torque wrench into the socket of the set screw
- Engage the counter torque tip with the rod
- Turn the torque wrench in a clockwise direction while firmly holding the counter torque until you hear an audible click.
- If using the line to line torque wrench, turn the wrench in the clockwise direction until the arrows on the torque wrench line up with each other.

Caution: *Over tightening the set screw more than the specified setting of 10 Nm (90 in/lbs) could lead to implant failure. In the event that the set screw is damaged, it must be replaced.*

- *Use the set screw revision screwdriver (FW193R) with the 4 mm hex tip to remove a previously tightened set screw.*

Warning: *Do not use the torque limiting wrench without the counter torque L-handle. This could lead to thread jumping of the set screw within the screw body and, as a consequence to rod loosening.*

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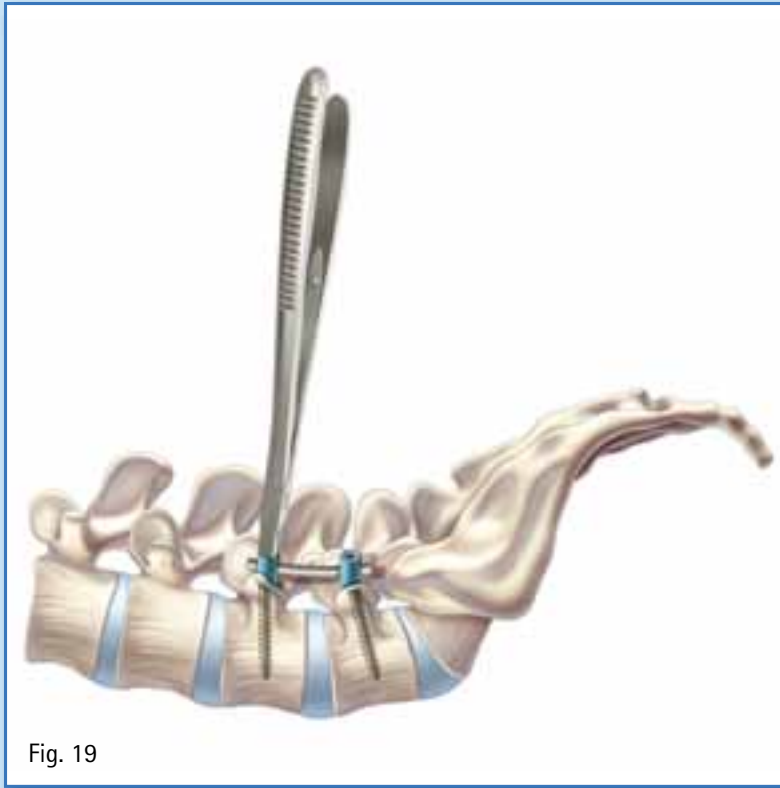


Fig. 19

11. Tab Removal

- Break off the extended tabs with the tab breaker (FW179R). (Fig. 19)

Note: Verify that all screws are fully tightened before breaking off the extended tabs. If a tab is prematurely broken off, use the rod persuader to help seat the rod fully into the saddle of the screw, which should simplify set screw placement.

V. ADDENDUM: Cross Connector Application

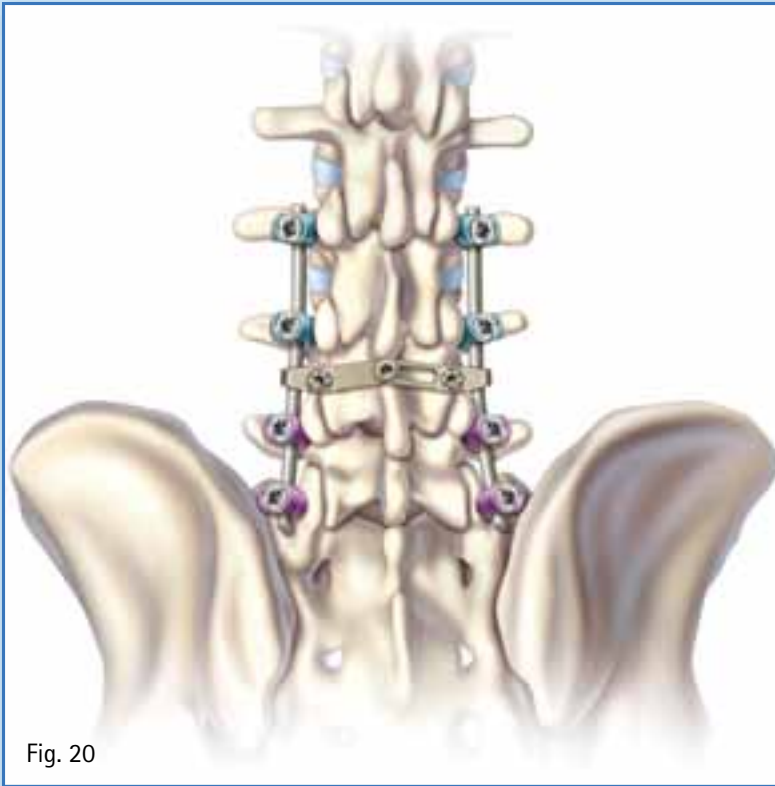


Fig. 20

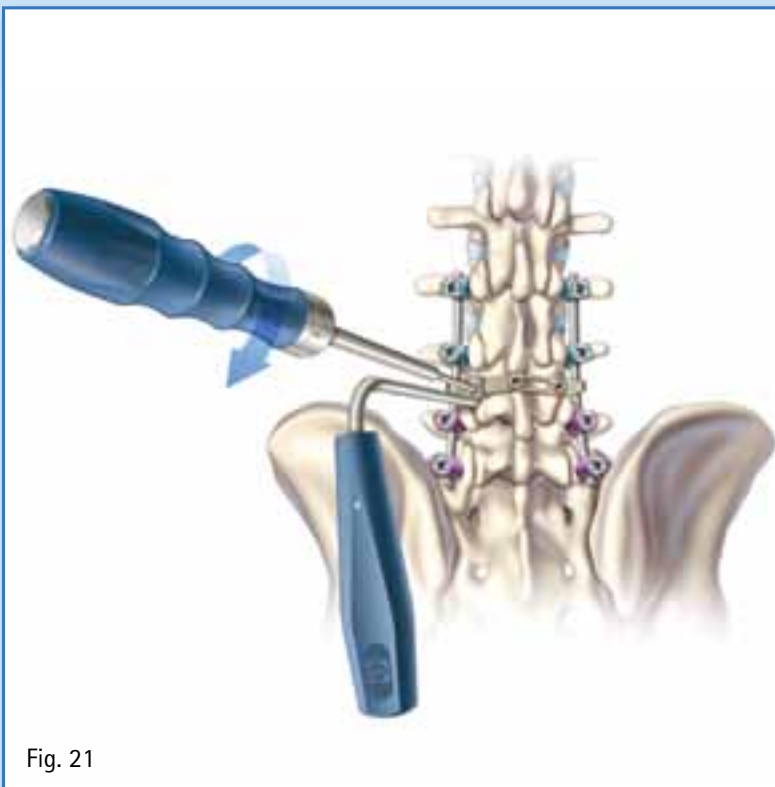


Fig. 21

1. Cross Connector Application

In the event that additional rotational stability of the construct is required, a cross connector may be used.

- Determine the appropriate size using the cross connector sizing template (FW202R).
- Verify there are no obstructions, then insert the cross connector. (Fig. 20)

- If the cross connector fits properly and is fully seated onto both rods, final tightening can be accomplished by applying 4 Nm (36 in/lbs) of torque to the locking screw using the cross connector torque wrench (FW207R) and the cross connector counter torque (FW204R). (Fig. 21)

If necessary, the optional "bar" style adjustable cross can be used.



- The bar style adjustable cross connectors can be contoured using the cross connector bender (FW203R).
- Place the cross connector face-up in the bender and apply the necessary force required to achieve appropriate angle. The maximum angle allowed by the cross connector is 20°.

Refer to page 30 for a complete list of implant sizes

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VI. ADDENDUM: Rod-to-Rod Connector Application

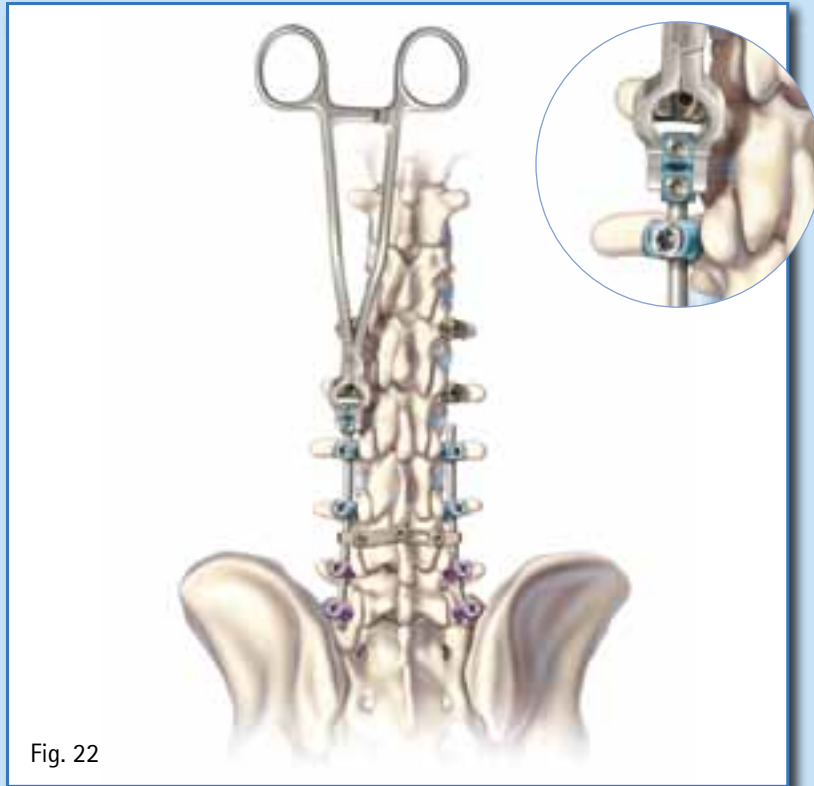


Fig. 22

A rod-to-rod connector may be used to extend an existing construct in the event of a revision surgery or for a new multilevel construct or to connect to an offset screw.

1. Axial Rod-to-Rod Connector Application

- To place the axial rod-to-rod connector, first determine required length (short or long).
- Use the rod-to-rod connector inserter (FW493R) to grab the connector and fully seat the rods inside the connector and confirm adequate rod placement using the provided window on the connector. (Fig. 22)

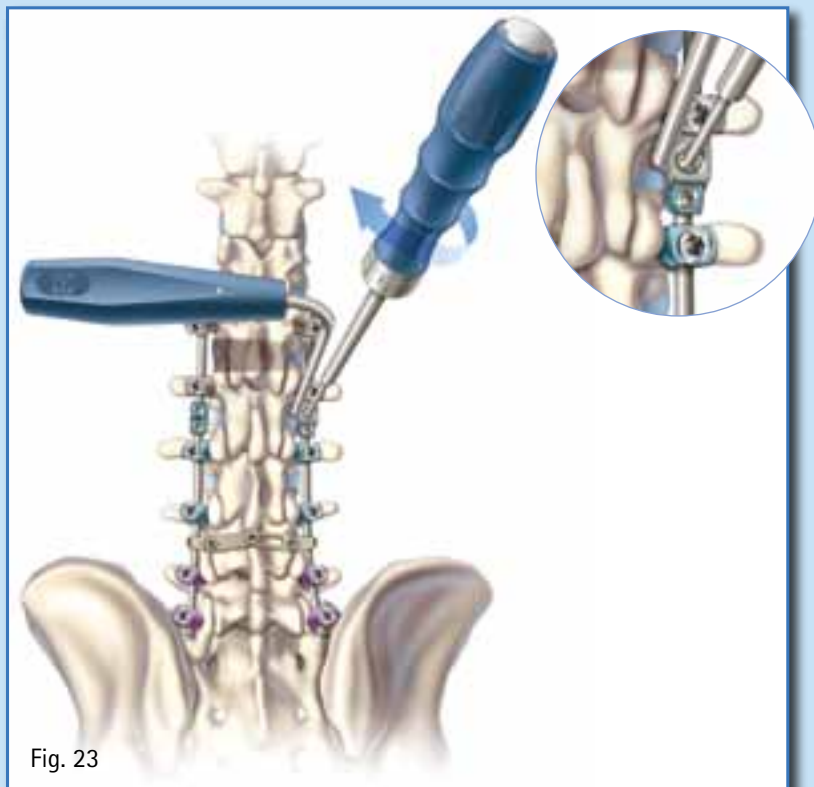


Fig. 23

- Final tighten by applying 4 Nm (36 in/lbs) of torque using the torque wrench screwdriver (FW207R) and the rod-to-rod connector counter torque device (FW495R). (Fig. 23)

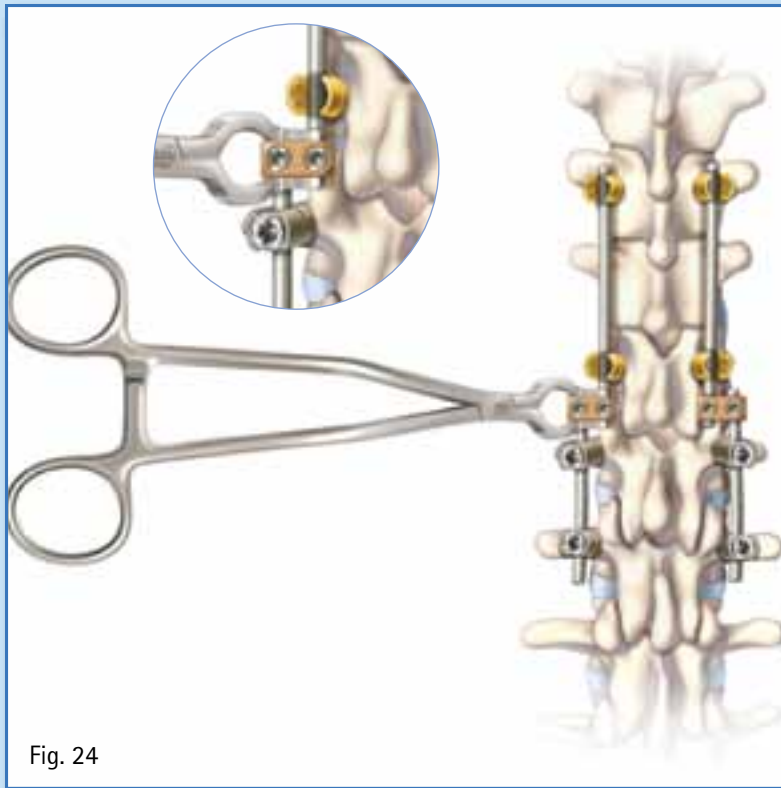


Fig. 24

2. Domino Rod-to-Rod Connector Application

- To place the domino rod-to-rod connector, first determine required length (7 mm or 11 mm) and desired connector type (open/closed or closed).
- For open/closed style, use the rod-to-rod connector inserter (FW493R) to grab the connector and slide a rod into the closed hole and then connect to the other rod using the open hole. (Fig. 24)

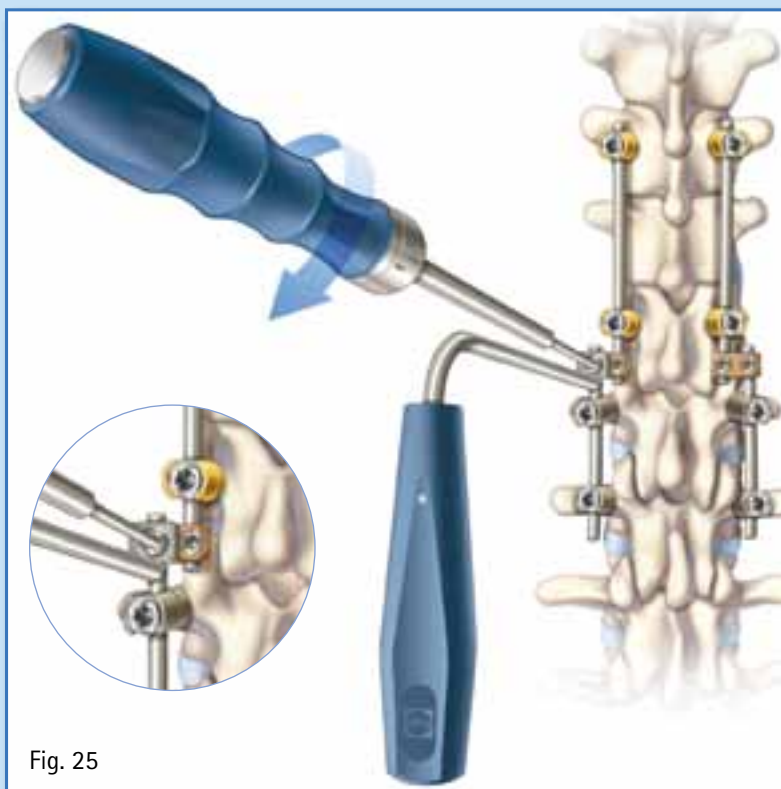


Fig. 25

- For closed style, use the inserter to grab the connector and slide both rods into the closed holes prior to placing the rods into the pedicle screw tulip heads.
- Final tighten by applying 4 Nm (36 in/lbs) of torque using the torque wrench screwdriver (FW207R) and rod-to-rod connector counter torque device (FW495R). (Fig. 25)

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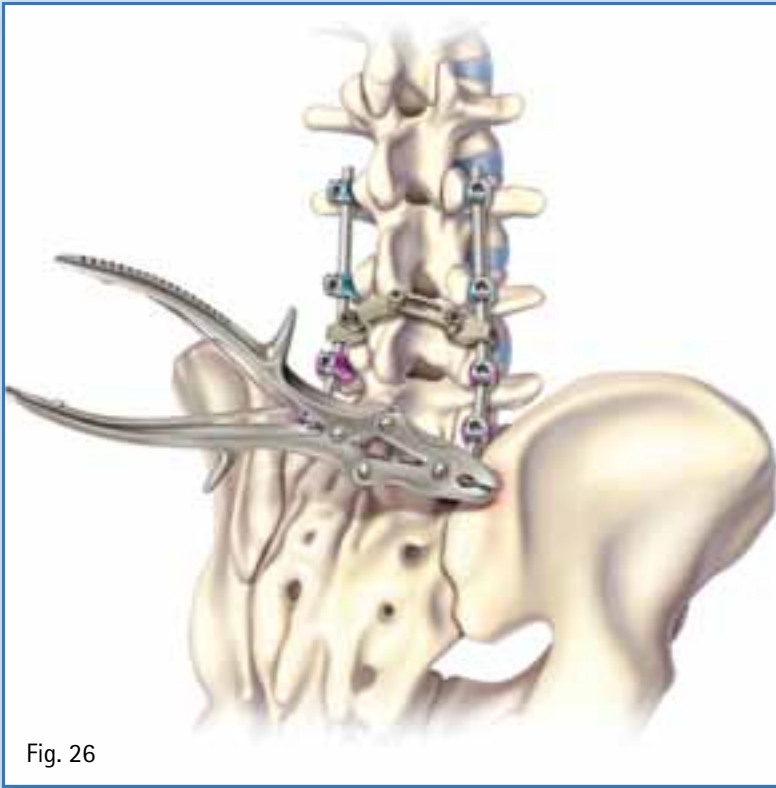


Fig. 26

3. Pelvic Screw & Lateral Offset Connector Application

The posterior of the iliac crest needs to be exposed for pelvic screw placement. Approximately 1.0 to 2.0 centimeters up from the tip of the spine is an ideal starting point.

- Use a rongeur to make a notch in the crest of sufficient length and depth for the head of the iliac screw. (Fig. 26)

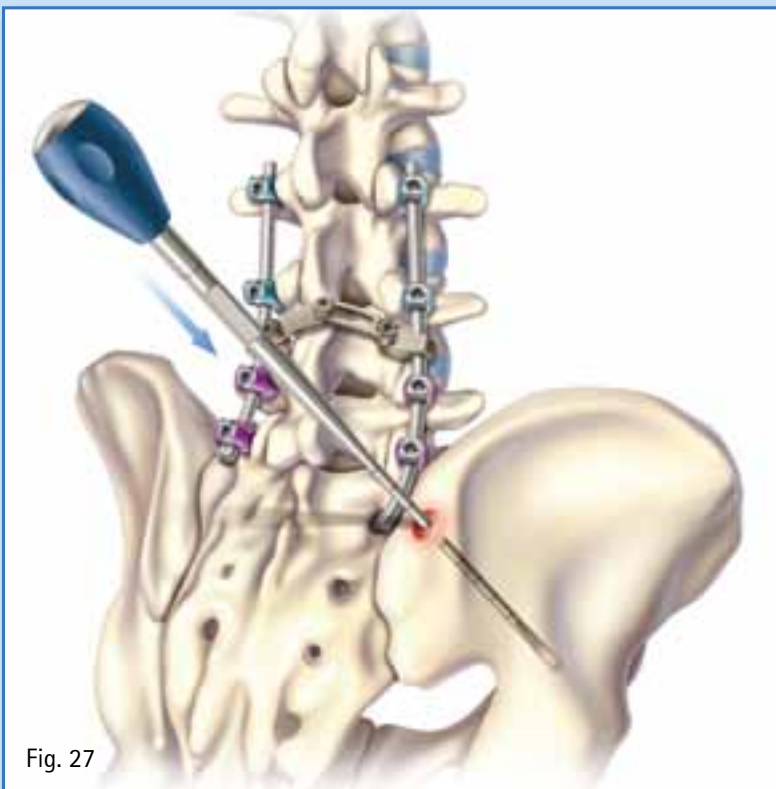


Fig. 27

- Perforate the ilium using a straight or curved extended length bone probe (FW476R or FW477R) or straight or curved extended length thoracic probe (FW474R or FW475R). (Fig. 27)

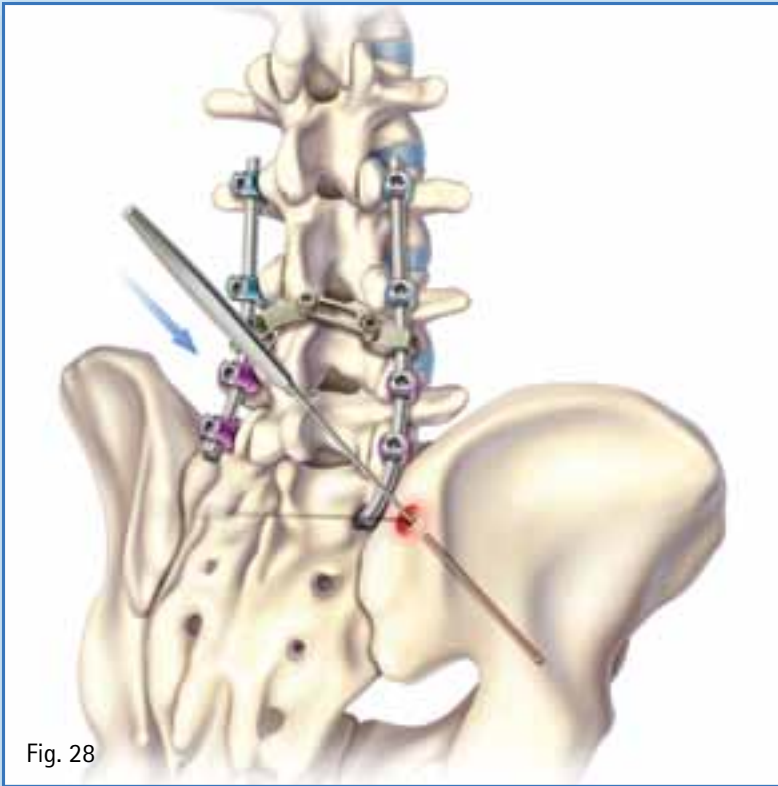


Fig. 28

- Utilize the straight or curved (FW146R or FW147R) pedicle sounder to confirm the patency of the Ilium canal. Stop every few centimeters during perforation to check integrity of the canal. (Fig. 28)

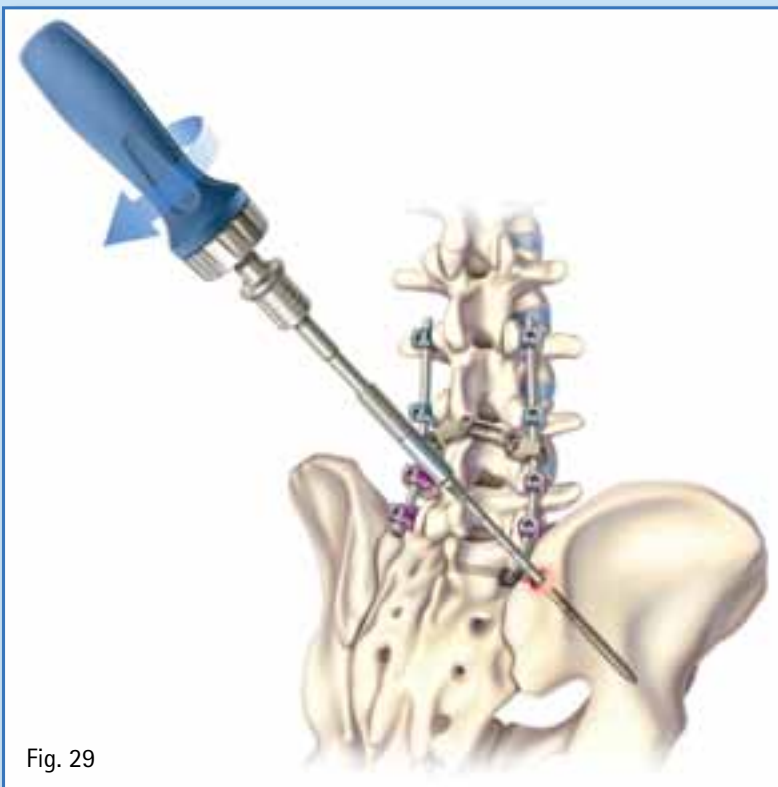


Fig. 29

- Tap canal and identify depth with the desired 7.0 mm extended screw tap (FW497R) or 8.0 mm extended screw tap (FW498R), and choose screw length. (Fig. 29)

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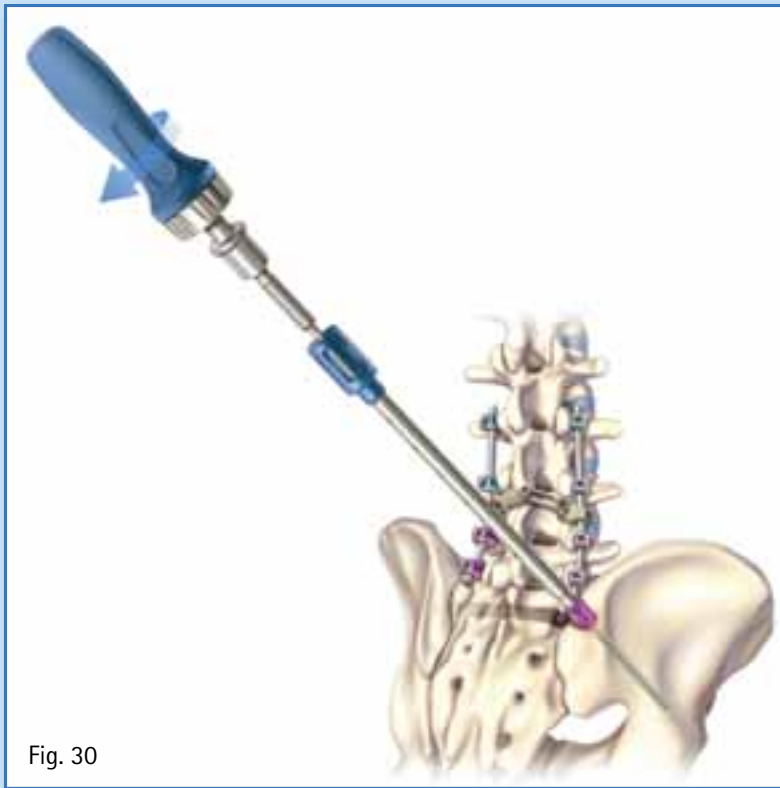


Fig. 30

- Attach desired handle to polyaxial screwdriver (FW277R) and thread the screw into the ilium. (Fig. 30)
- Determine offset distance between the pelvic screw and the rod from the main construct and choose desired lateral offset connector type (open/closed or closed).

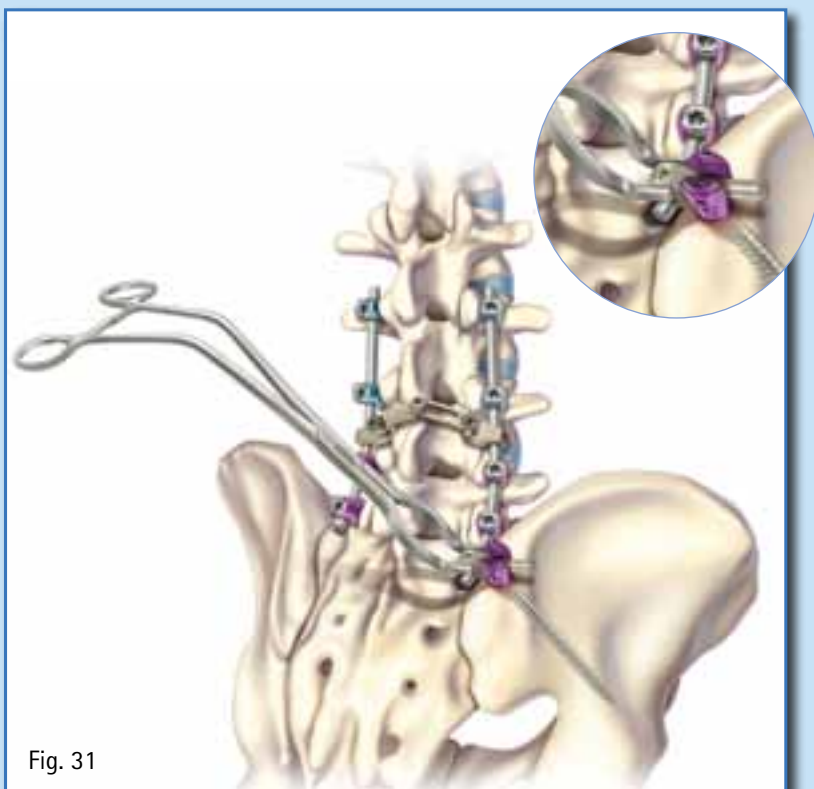


Fig. 31

- Use the rod-to-rod connector inserter (FW493R) to grab the lateral offset connector and attach it to the rod from the main construct. (Fig. 31)

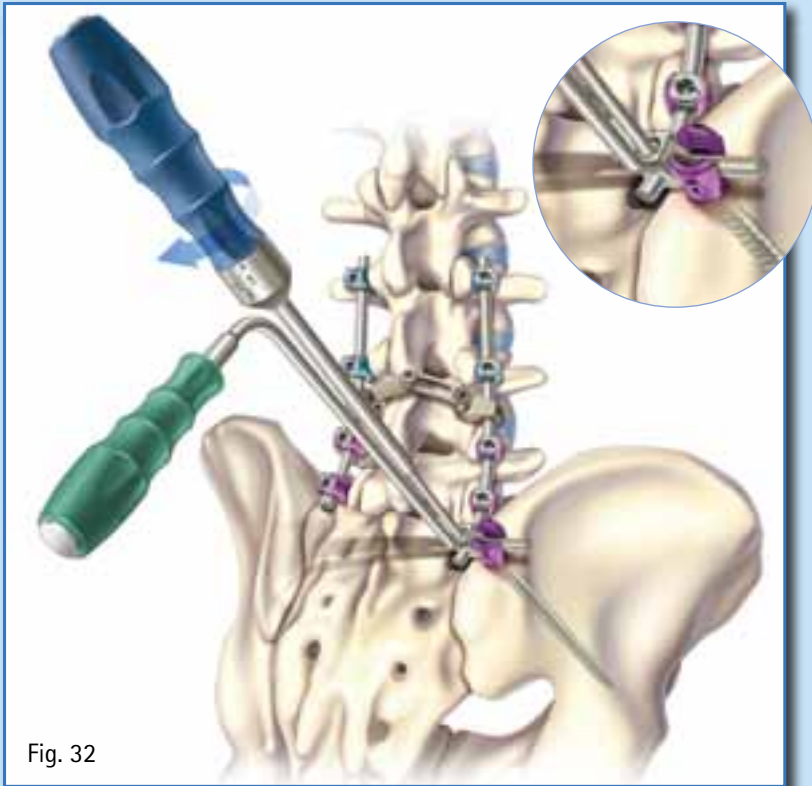


Fig. 32

- Final tighten by applying 4 Nm (36 in/lbs) of torque using the torque wrench screwdriver (FW207R) and rod-to-rod connector counter torque device (FW495R). (Fig. 32)
- After connecting the lateral offset connector to the rod from the main construct, a rocker or rod persuader may be used to fully seat the connector rod into the pelvic screw's tulip head.

Note: For sacropelvic fixation, it is recommended to place a screw in the sacrum, which is attached to the spinal rod, above or below the attachment of the lateral offset rod connector to the rod.

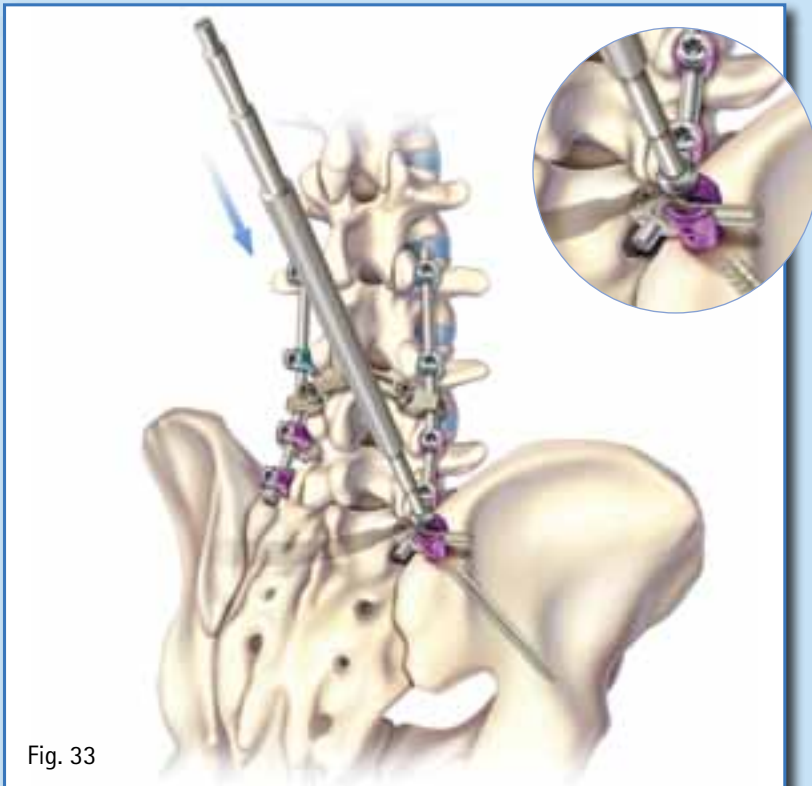


Fig. 33

- Start the set screw on the pelvic screw and finger tighten the set screw.(Fig. 33)

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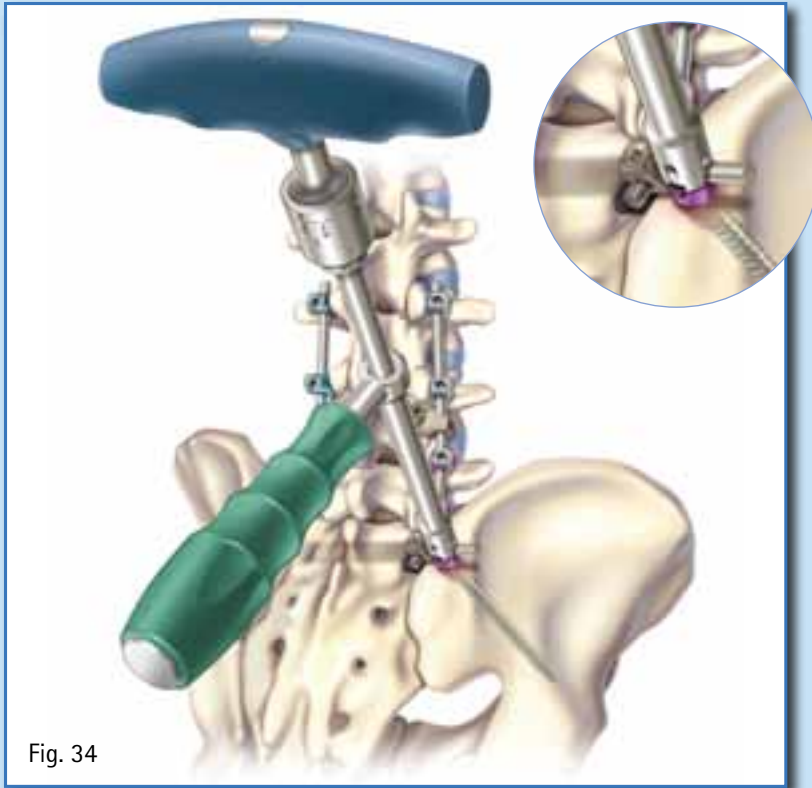


Fig. 34

- Final tighten the set screw by using the clicking torque wrench or the line to line torque wrench along with the counter torque L-handle (FW170R) (as described in section 10). (Fig. 34)

Note: For removal of rod-to-rod connector, use connector revision screwdriver (FW491R). To remove pedicle screw, first use set screw revision screwdriver (FW193R) to disengage set screw and use screwdriver with shank tip (FW174R) to remove the polyaxial screw.

VII. ADDENDUM: Hook Application

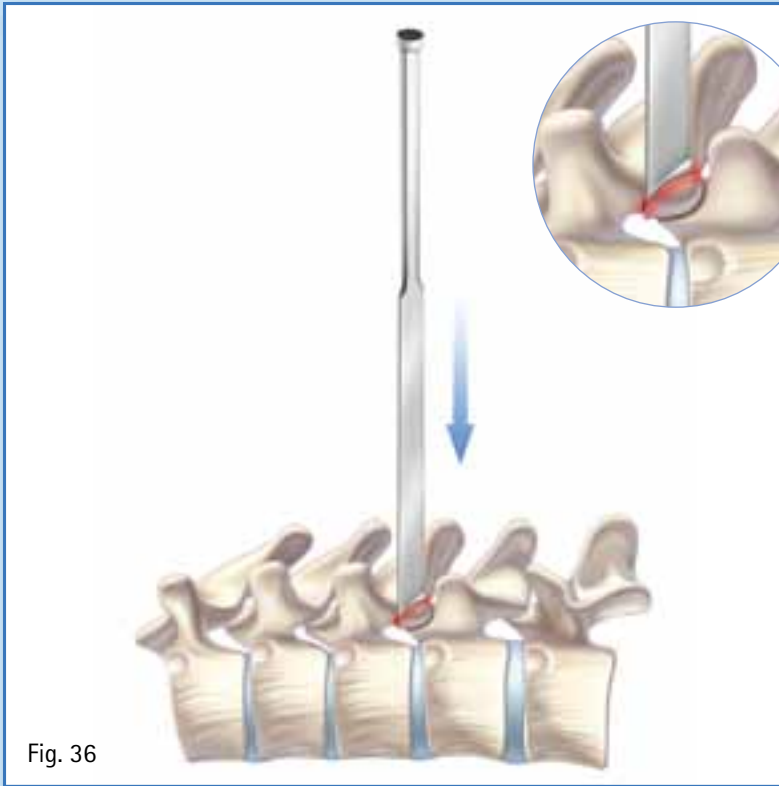


Fig. 36

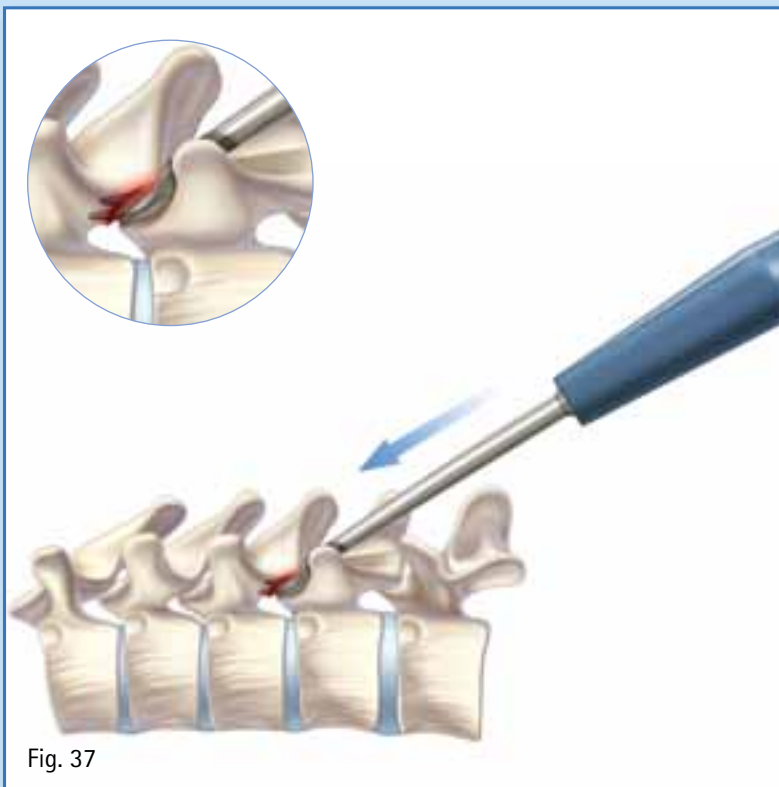


Fig. 37

1. Pedicle Hook Application

- Resect the tip of the inferior articular process using an osteotome. (Fig. 36)

Note: If the facet is not resected enough, the pedicle preparator blade will not allow proper preparation of the pedicle. Further resection of the facet is then recommended.

- Prepare the bed for pedicle hook insertion with the pedicle preparator (FW251R). (Fig. 37)

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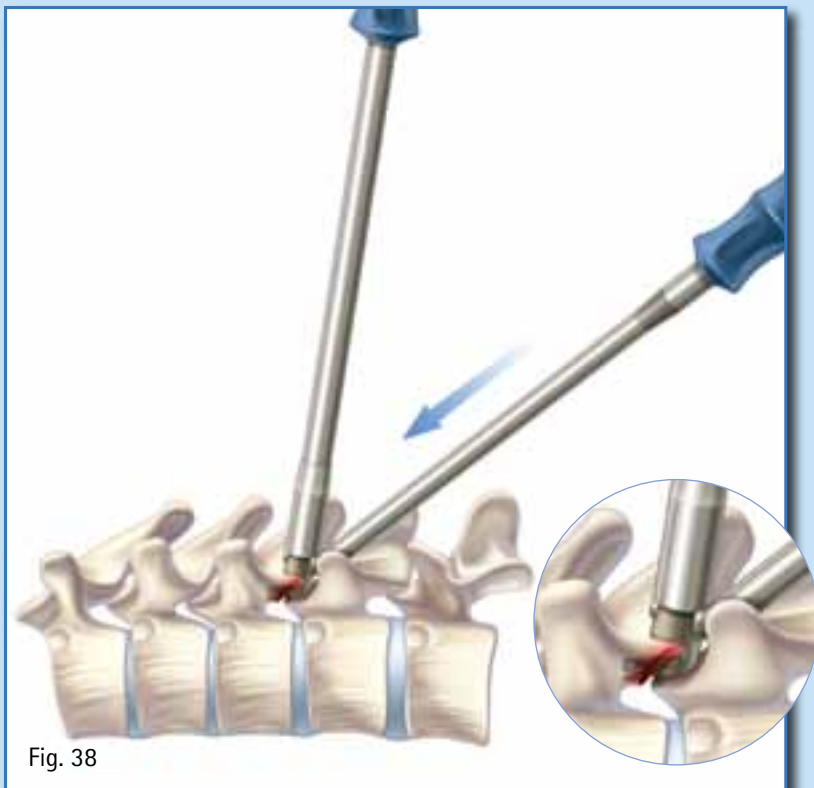


Fig. 38

- Attach the hook to the facet joint using the hook holder (FW211R) supported by the hook pusher (FW212R). The hook can be impacted by the hook pusher. (Fig. 38)

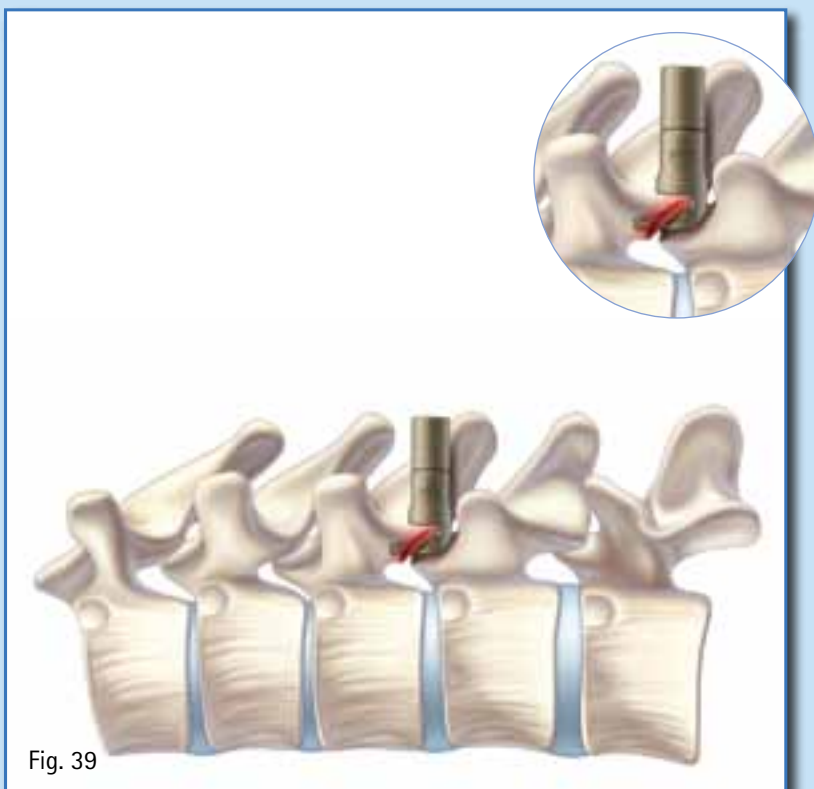


Fig. 39

- Show the pedicle hook fully seated. (Fig. 39)

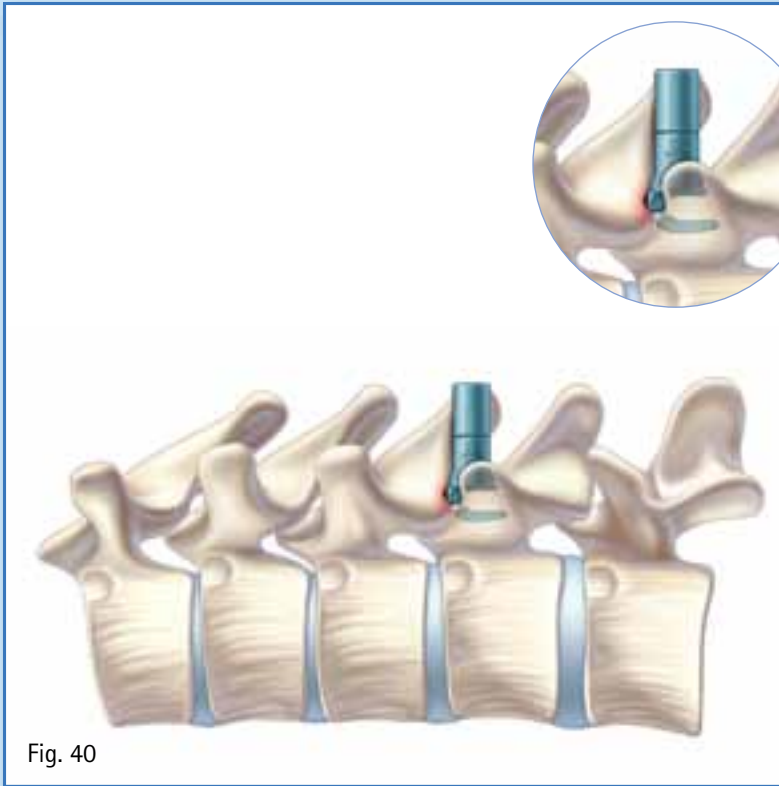


Fig. 40

2. Lamina Hook Application

- Prepare a flat bed for the lamina hook with the lamina preparator (FW152R).
- Maintain the hook in a horizontal position using the hook holder (FW211R) and carefully rotate around the edge of the lamina in a vertical position supported by the hook pusher (FW212R).
- (Fig. 40)

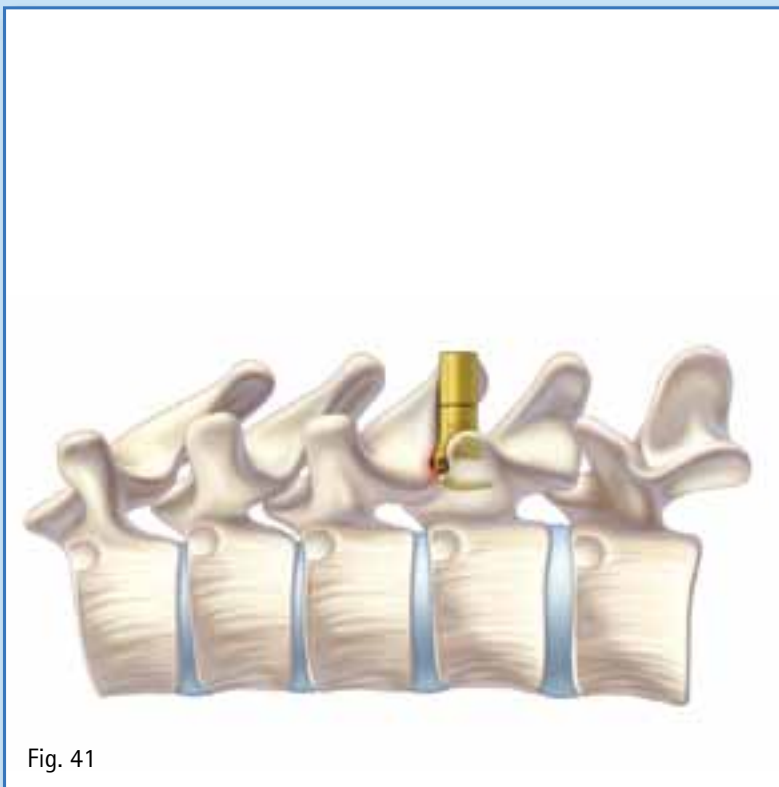


Fig. 41

3. Thoracic Hook Application

- The smooth, slim design of the thoracic hook is adapted to the shape of the thoracic lamina.
- Prepare and place the thoracic hooks in the same way as the lamina hooks.
- (Fig. 41)

Note: Tightening of the hooks to the rod is conducted in the same way as the pedicle screws as described in sections 6, 10 & 11).

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VIII. Implant Overview

S⁴® Monoaxial Screws

Item No.	Diameter	Length
SW701T	4.5 mm	25 mm
SW702T	4.5 mm	30 mm
SW703T	4.5 mm	35 mm
SW704T	4.5 mm	40 mm
SW706T	4.5 mm	45 mm
SW707T	4.5 mm	50 mm
SW711T	5.0 mm	25 mm
SW712T	5.0 mm	30 mm
SW713T	5.0 mm	35 mm
SW714T	5.0 mm	40 mm
SW716T	5.0 mm	45 mm
SW717T	5.0 mm	50 mm
SW721T	6.0 mm	25 mm
SW722T	6.0 mm	30 mm
SW723T	6.0 mm	35 mm
SW724T	6.0 mm	40 mm
SW726T	6.0 mm	45 mm
SW727T	6.0 mm	50 mm
SW728T	6.0 mm	55 mm
SW729T	6.0 mm	60 mm



Item No.	Diameter	Length
SW731T	7.0 mm	25 mm
SW732T	7.0 mm	30 mm
SW733T	7.0 mm	35 mm
SW734T	7.0 mm	40 mm
SW736T	7.0 mm	45 mm
SW737T	7.0 mm	50 mm
SW738T	7.0 mm	55 mm
SW739T	7.0 mm	60 mm
SW742T	8.0 mm	30 mm
SW743T	8.0 mm	35 mm
SW744T	8.0 mm	40 mm
SW746T	8.0 mm	45 mm
SW747T	8.0 mm	50 mm
SW748T	8.0 mm	55 mm
SW749T	8.0 mm	60 mm



S⁴® Polyaxial Screws

Item No.	Diameter	Length
SW751T	4.5 mm	25 mm
SW752T	4.5 mm	30 mm
SW753T	4.5 mm	35 mm
SW754T	4.5 mm	40 mm
SW756T	4.5 mm	45 mm
SW757T	4.5 mm	50 mm
SW761T	5.0 mm	25 mm
SW762T	5.0 mm	30 mm
SW763T	5.0 mm	35 mm
SW764T	5.0 mm	40 mm
SW766T	5.0 mm	45 mm
SW767T	5.0 mm	50 mm
SW771T	6.0 mm	25 mm
SW772T	6.0 mm	30 mm
SW773T	6.0 mm	35 mm
SW774T	6.0 mm	40 mm
SW776T	6.0 mm	45 mm
SW777T	6.0 mm	50 mm
SW778T	6.0 mm	55 mm
SW779T	6.0 mm	60 mm



Item No.	Diameter	Length
SW781T	7.0 mm	25 mm
SW782T	7.0 mm	30 mm
SW783T	7.0 mm	35 mm
SW784T	7.0 mm	40 mm
SW786T	7.0 mm	45 mm
SW787T	7.0 mm	50 mm
SW788T	7.0 mm	55 mm
SW789T	7.0 mm	60 mm
SW792T	8.0 mm	30 mm
SW793T	8.0 mm	35 mm
SW794T	8.0 mm	40 mm
SW796T	8.0 mm	45 mm
SW797T	8.0 mm	50 mm
SW798T	8.0 mm	55 mm
SW799T	8.0 mm	60 mm



Item No.	Diameter	Length
SW802T	9.0 mm	30 mm
SW803T	9.0 mm	35 mm
SW804T	9.0 mm	40 mm
SW806T	9.0 mm	45 mm
SW807T	9.0 mm	50 mm
SW808T	9.0 mm	55 mm
SW809T	9.0 mm	60 mm
SW812T	10.0 mm	30 mm
SW813T	10.0 mm	35 mm
SW814T	10.0 mm	40 mm
SW816T	10.0 mm	45 mm
SW817T	10.0 mm	50 mm
SW818T	10.0 mm	55 mm
SW819T	10.0 mm	60 mm



S⁴ Lamina Hooks (Gold)

Item No.	Size	Type
SW826T	6 mm	Left
SW827T	6 mm	Right
SW827T	10 mm	Left
SW828T	10 mm	Right



S⁴ Pedicle Hooks (Silver)

Item No.	Size
SW831T	6 mm
SW832T	10 mm



S⁴ Thoracic Hooks (Blue)

Item No.	Size
SW833T	6 mm
SW834T	8 mm



S⁴ Set Screw

Item No.	Description
SW790T	Set Screw



S⁴ Pre-Bent Rods, 5.5 mm

Item No.	Length
SW653T	30 mm
SW654T	35 mm
SW655T	40 mm
SW656T	45 mm
SW657T	50 mm
SW658T	55 mm
SW659T	60 mm
SW661T	70 mm
SW662T	80 mm
SW663T	90 mm
SW684T	100 mm



S⁴ Straight Rods, 5.5 mm

Item No.	Length
SW674T	35 mm
SW675T	40 mm
SW676T	45 mm
SW677T	50 mm
SW678T	55 mm
SW679T	60 mm
SW681T	70 mm
SW682T	80 mm
SW664T	100 mm
SW666T	120 mm
SW667T	150 mm
SW668T	180 mm
SW669T	200 mm
SW670T	300 mm
SW671T	400 mm
SW672T	500 mm



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S⁴ Adjustable Cross Connectors

Item No.	Length
SW488T	35-36 mm
SW489T	36-38 mm
SW494T	38-42 mm
SW495T	42-50 mm
SW496T	50-60 mm
SW497T	60-77 mm
SW498T	77-107 mm
SW697T	43-49 mm
SW698T	49-60 mm
SW699T	60-75 mm



S⁴ Rigid Cross Connectors

Item No.	Length
SW490T	28 mm
SW491T	30 mm
SW492T	32 mm
SW493T	34 mm
SW690T	21 mm
SW691T	25 mm
SW695T	38 mm
SW696T	41 mm



Rod-to-rod Connectors

Item No.	Type	Length
SW842T	Closed Domino Connector	7 mm
SW844T	Closed Domino Connector	11 mm
SW841T	Closed/Open Domino Connector	7 mm
SW843T	Closed/Open Domino Connector	11 mm
SW838T	Axial Connector	Short
SW839T	Axial Connector	Long
SW847T	Closed Lateral Offset Connector	20 mm
SW849T	Closed Lateral Offset Connector	35 mm
SW872T	Closed Lateral Offset Connector	50 mm
SW846T	Open Lateral Offset Connector	20 mm
SW848T	Open Lateral Offset Connector	35 mm
SW871T	Open Lateral Offset Connector	50 mm



IX. Instrument Overview

Awl

Item No.	Description
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FW190R	Bone Awl
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Probes

Item No.	Description
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FW188R	Straight Pedicle Probe
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FW189R	Curved Pedicle Probe
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FW248R	Straight Lenke Probe
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FW249R	Curved Lenke Probe
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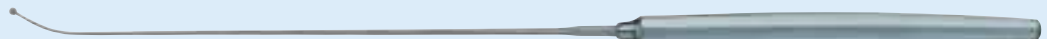
Sounders

Item No.	Description
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FW146R	Straight Pedicle Sounder
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FW147R	Curved Pedicle Sounder
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Pedicle Markers

Item No.	Description
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FW191R	Single Band Pedicle Marker
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FW192R	Dual Band Pedicle Marker
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Handles	
Item No.	Description
ME175R	Ratchet Straight Handle
FW167R	Ratchet T-Handle
Screw Taps	
Item No.	Description
FW194R	Screw Tap, 4.5 mm
FW195R	Screw Tap, 5.0 mm
FW196R	Screw Tap, 6.0 mm
FW197R	Screw Tap, 7.0 mm
FW198R	Screw Tap, 8.0 mm
FW356R	Screw Tap, 9.0 mm
FW357R	Screw Tap, 10.0 mm


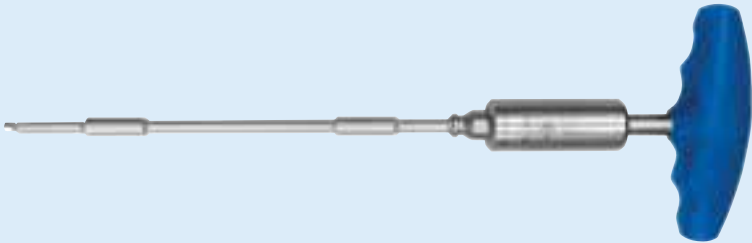



Screwdrivers		
Item No.	Description	
FW156R	Polyaxial Screws Rigid Fixation Screwdriver	
FW173R	Polyaxial Screws Retaining Clip Screwdriver	
FW176R	Monoaxial Screws Screwdriver	
FW174R	Removal Screwdriver with Shank Tip	
FW193R	Set Screw Revision Screwdriver	
Manipulator		
Item No.	Description	
FW180R	Screw Body Manipulator	
Set Screw Starters		
Item No.	Description	
FW279R	Dual Ended Set Screw Starter	
FW251R	Handled Set Screw Starter	


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Wrench

Item No.	Description	
FW178R	Counter Torque L-Handle	
FW150R	Clicking Torque Wrench	
FW170R	Line-to-Line Torque Wrench	

Rod Trial

Item No.	Description	
FW185R	Flexible Rod Trial	


Rod Bender

Item No.	Description	
FW024R	French Rod Bender	

Rod Holding Forceps

Item No.	Description	
FW012R	Rod Holding Forceps	

Rod Pusher

Item No.	Description	
FW513R	Rod Pusher	

Rod Persuader

Item No.	Description	
FW208R	Rod Persuader	 

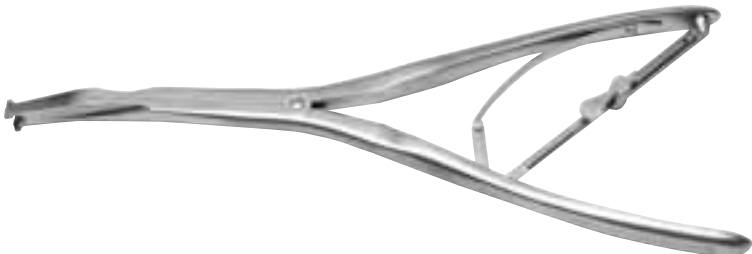
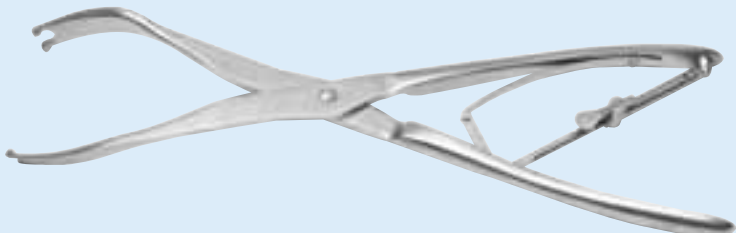
Benders

Item No.	Description	
FW252R	In-situ Rod Bender, Left	
FW253R	In-situ Rod Bender, Right	


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Forceps

Item No.	Description	
FW281R	Distraction Forceps	
FW282R	Compression Forceps	

Derotation Sleeve

Item No.	Description	
FW183R	Derotation Sleeve	

Tab Breaker

Item No.	Description	
FW179R	Tab Breaker	

Connector Instruments

Item No. Description

FW493R Rod-to-Rod Connector Inserter



FW495R Rod-to-Rod Connector Counter-torque




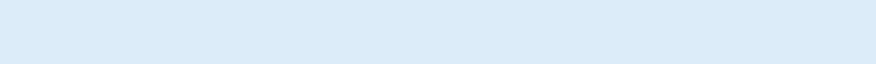



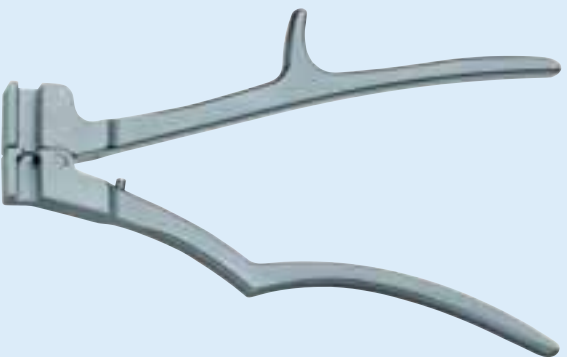


FW491R Connector Revision Screwdriver





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Screw Taps & Bone Probes		
Item No.	Description	
FW497R	Extended Length Screw Tap, 7.0 mm	
FW498R	Extended Length Screw Tap, 8.0 mm	
FW474R	Extended Length Lenke Probe, Straight	
FW475R	Extended Length Lenke Probe, Curved	
FW476R	Extended Length Bone Probe, Straight	
FW477R	Extended Length Bone Probe, Curved	
Cross Connector Instruments		
Item No.	Description	
FW202R	Cross Connector Sizing Template	
FW203R	Cross Connector Bender	



Cross Connector Instruments (Continued)

Item No.	Description	
FW204R	Cross Connector Counter Torque	
FW207R	Cross Connector Torque Wrench, 4 Nm	

Preparators

Item No.	Description	
FW151R	Pedicle Preparator	
FW152R	Lamina Preparator	

Hook Holders & Hook Inserter

Item No.	Description	
FW211R	Hook Holder	
FW212R	Hook Inserter	

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