



DEGENERATIVE
SPINAL DISORDERS

AESCULAP[®] S4[®] ELEMENT


THORACOLUMBAR POSTERIOR PEDICLE SCREW SYSTEM

SURGICAL TECHNIQUE

PROTECTING AND PRESERVING SPINAL STABILITY

Modern lifestyle has resulted in increasing physical inactivity among people all over the world. Of the many medical problems associated with this, spinal disorders are among the most critical. This is even more significant as the spinal column is one of the most important structures in the human body. It supports and stabilizes the upper body and is the center of our musculoskeletal system, which gives the body movement.

Our work in the field of degenerative spinal disorders is dedicated to protecting the spinal column and preserving its stability. We support spine surgeons with durable, reliable products and partner services for safe procedures and good clinical outcomes.¹⁻⁷ Our philosophy of sharing expertise with healthcare professionals and patients allows us to develop innovative implant and instrument systems that help to preserve stability and stabilize the cervical and thoracolumbar spine.¹⁻⁷

- 
- ¹ Tropiano P, Bronsard JJ, Louis C, Tallet JM, Sauget Y. Three column stabilisation through a posterior approach with a titanium Plasmapore intervertebral block (Prospace). Radiological and clinical study after 4 years. *Rivista di Neuroradiologia*. 1999;12(Suppl 1):89-94.
 - ² Kroppenstedt S, Gulde M, Schönmayr R. Radiological comparison of instrumented posterior lumbar interbody fusion with one or two closed-box Plasmapore coated titanium cages. Follow-up study over more than seven years. *Spine*. 2008;33(19):2083-8.
 - ³ Kreinest M, Schmahl D, Grützner PA, Matschke S. Radiological Results and Clinical Patient Outcome After Implantation of a Hydraulic Expandable Vertebral Body Replacement following Traumatic Vertebral Fractures in the Thoracic and Lumbar Spine: A 3-Year Follow-Up. *Spine (Phila Pa 1976)*. 2017 Apr 15;42(8):E482-E489.
 - ⁴ Takeuchi M, Yasuda M, Niwa A, Wakao N, Nakura T, Osuka K, Kamiya M, Takayasu M. Plasmapore-coated titanium cervical cages induce more rapid and complete bone fusion after anterior cervical discectomy and fusion as compared to noncoated titanium cage. *World Neurosurgery*. 2014;82(3/4):519-22.
 - ⁵ Vanek P, Bradac O, Konopkova R, de Lacy P, Lacman J, Benes V. Treatment of thoracolumbar trauma by short-segment percutaneous transpedicular screw instrumentation: prospective comparative study with a minimum 2-year follow-up. *J Neurosurg Spine*. 2014;20:150-6.
 - ⁶ Beisse R. Endoscopic surgery on the thoracolumbar junction of the spine. *Eur Spine J*. 2006;15:687-704.
 - ⁷ Finger T, Bayerl S, Onken J, Czabanka M, Woitzik J, Vajkoczy P. Sacropelvic fixation versus fusion to the sacrum for spondylolysis in multilevel degenerative spine disease. *Eur Spine J*. 2014;23:1013-20.

AESCLAP THORACOLUMBAR SPINE

PORTFOLIO OVERVIEW

IMPLANT SYSTEMS

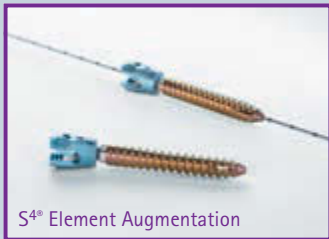
posterior



S4° Element MIS



S4° Element Open



S4° Element Augmentation



S4° Element Multilevel



S4° Long Tab



S4° Spinal System



PROSPACE° XP/PEEK/Titanium



TSPACE° XP/PEEK/Titanium

anterior



Hydrolift°



Mac II



Arcadius XP L°

INSTRUMENT SYSTEMS

posterior



Spine Classics MLD System



Mini-Open Retractor System



CLR

anterior



activ 0

AESCULAP® S4® ELEMENT

CONTENT





A SYSTEM OVERVIEW

B OPEN TECHNIQUE

- B.1. Pedicle Preparation
- B.2. Tapping
- B.3. Screw Application
- B.4. Rod Placement
- B.5. Rod Reduction
- B.6. Set Screw Application
- B.7. Compression Maneuver
- B.8. Distraction Maneuver
- B.9. Derotation Maneuver
- B.10. Final Tightening

C ADDENDUM: CROSS CONNECTOR APPLICATION

- C.1. Cross Connector Application

D ADDENDUM: ROD-TO-ROD CONNECTOR APPLICATION

- D.1. Axial Rod-To-Rod Connector Application
- D.2. Domino Rod-To-Rod Connector Application
- D.3. Pelvic Screw & Lateral Offset Connector Application

E OPEN AUGMENTATION TECHNIQUE

- E.1. Screw Placement
- E.2. Cannula Attachment
- E.3. Cement Application

F IMPLANTS & INSTRUMENTS OVERVIEW

AESCULAP® S4® ELEMENT

A | SYSTEM OVERVIEW

PRODUCT ADVANTAGES

The S4® Element implants are engineered to stabilize the construct while providing intuitively designed instrumentation for ease in implantation.

➤ 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, improving construct stability.

➤ UNDERCUT THREAD DESIGN

Help eliminate cross threading by directing the force inward, improving force transmission and efficiency throughout the rod-screw construct.



AESCULAP® S4® ELEMENT

A | SYSTEM OVERVIEW

SYSTEM FEATURES

The S4® Element Spine System is a low profile and innovative thoracolumbar pedicle fixation system designed to address complex posterior pathologies. The S4® Element system features a sophisticated pressure vessel locking design capable of delivering biomechanical stability while maintaining an ultra-low profile.



The S4® Element Spine System is a top-loading low profile pedicle screw system that 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, ilium

screws, pre-cut straight and pre-bent rods, rigid & adjustable cross connectors, and a variety of rod-to-rod connectors used to extend an existing construct in the event of a revision surgery or for new multilevel construct.



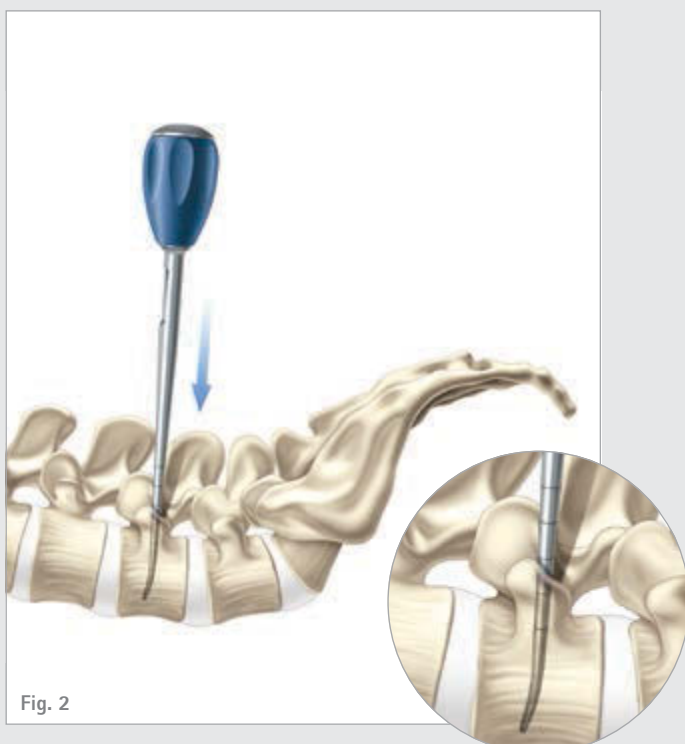
AESCULAP® S4® ELEMENT

B | OPEN TECHNIQUE



B.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 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.
- If necessary, single or dual band Pedicle Markers (FW191R or FW192R) can be used to identify proper anatomic location on intra-operative imaging.

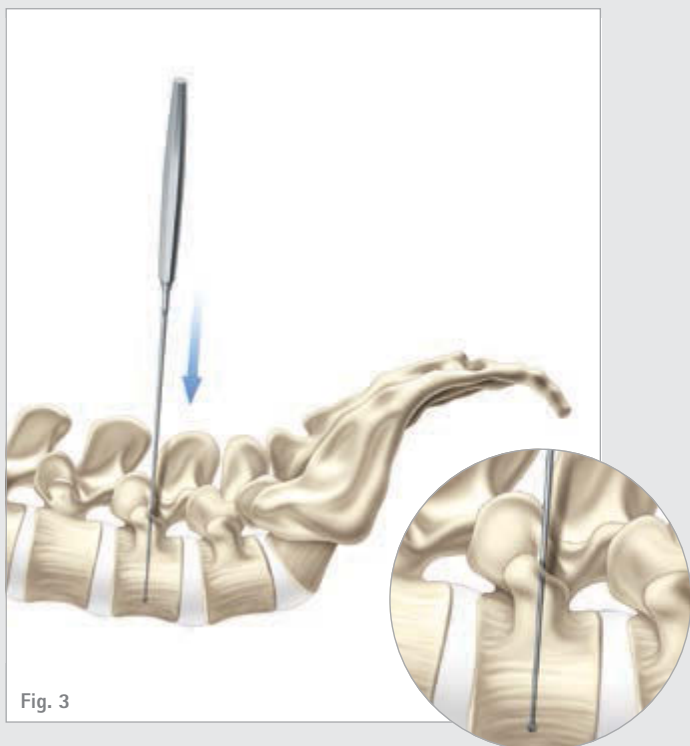


Fig. 3

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

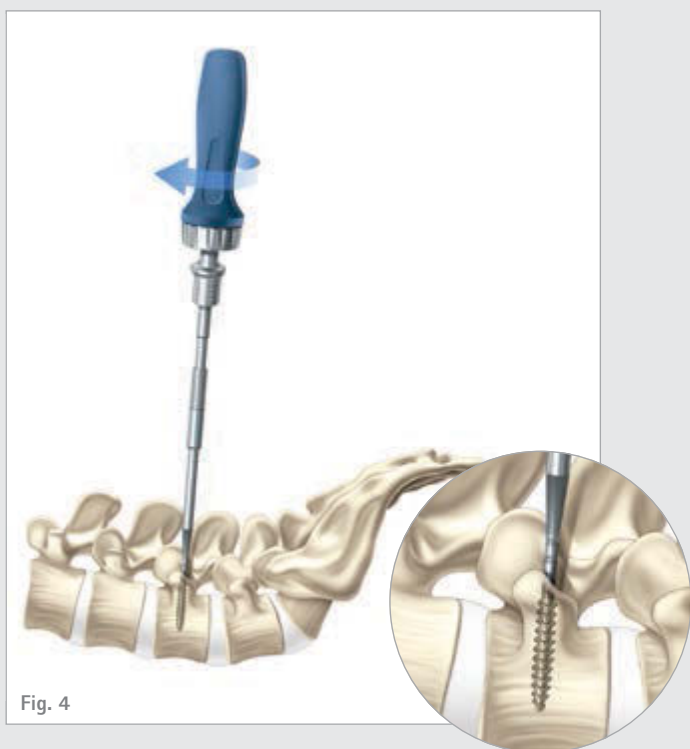


Fig. 4

B.2. TAPPING

Although the S4[®] Element Spine System screws are self-tapping, Screw Taps are available in all diameters if desired.

- To tap, attach the straight Ratchet Handle or the T-Handle (FW165R or FW167R) to the appropriate tap based on the screw diameter. (Fig. 4)

AESCULAP® S4® ELEMENT

B | OPEN TECHNIQUE



B.3. SCREW APPLICATION

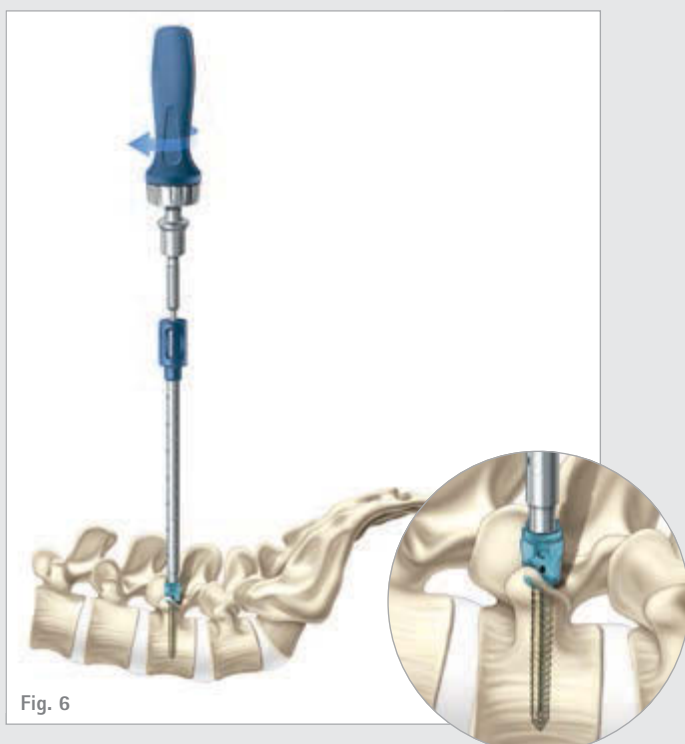
Color-coded polyaxial screws and monoaxial screws are available in various lengths and diameters.

Polyaxial and Monoaxial Screw Application

- Attach and fully engage the hexagonal tip of the Rigid Fixation Screw Driver (FW277R & FW276R) into the head of the screw. With the Rigid Fixation Screw Driver engaging the screw head, rotate the blue twist knob in a clockwise fashion while holding the bone screw to lock the threaded end of the Screw Driver into the screw head.

Caution:

- Ensure that the Screw Driver is fully engaged and threaded onto the screw.



- Thread the screw into the prepared pedicle and release the Screw Driver from the screw head by turning the blue twist knob counter clockwise. (Fig. 6)

Caution:

- Do not thread the screw all the way into the vertebral body. Ensure that the screw maintains polyaxiality.

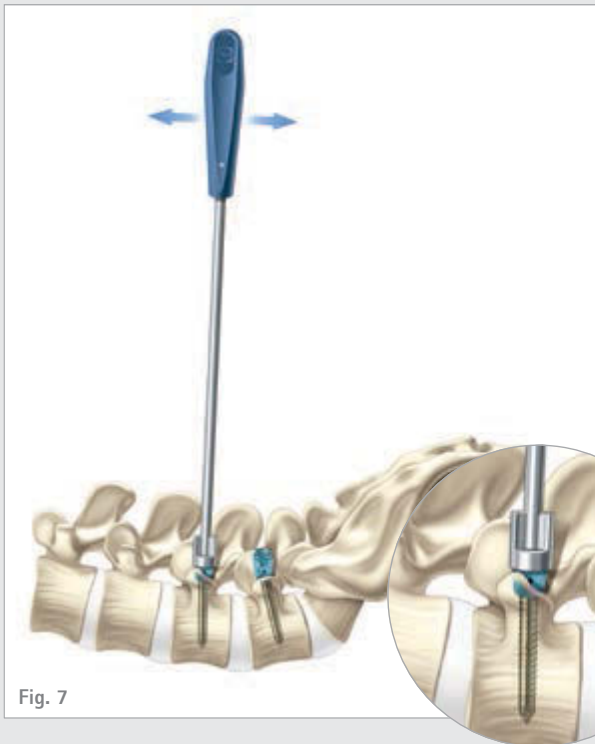


Fig. 7

- All polyaxial screw heads have 42° range of motion. If desired, align the polyaxial screw bodies using the Screw Body Manipulator (FW278R). (Fig. 7)

Note:

- In case of soft tissue impingement, the Marnay Lever (FW154R) can be used to retract soft tissue. If revision is necessary, use the Screw Manipulator to release the axial lock of the screw body and then use the Shank Tip Screw Driver (FW174R) for the safe removal of polyaxial screws.

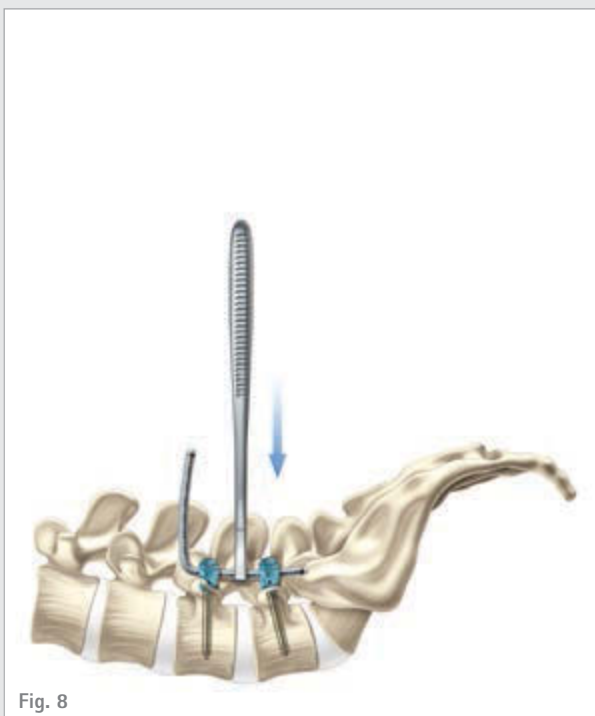


Fig. 8

B.4. ROD PLACEMENT

- Optional use of flexible Rod Trials (FW185R) as a guide for rod bending and measuring correct rod length. (Fig. 8)

AESCULAP® S4® ELEMENT

B | OPEN TECHNIQUE



Fig. 9

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. 9)

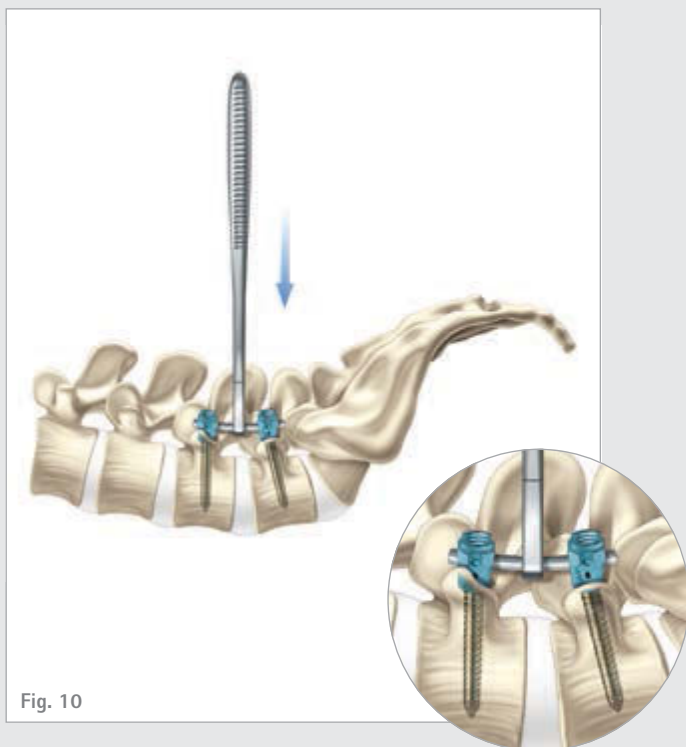


Fig. 10

- Use the Rod Holding Forceps (FW012R) to assist with rod placement or rod manipulation. (Fig. 10)

B.5. ROD REDUCTION

a) Reduction by Rod Persuader

- Place the Rod Persuader (FW285R) over the implant head and ensure the tip of the persuader is fully engaged to the head of the implant. (Fig. 11)
- Squeeze the handle of the persuader to seat the rod into the head of the pedicle screw.

Optional:

- FW485R S4® Element Detachable Rod Persuader can be used instead of FW285R.

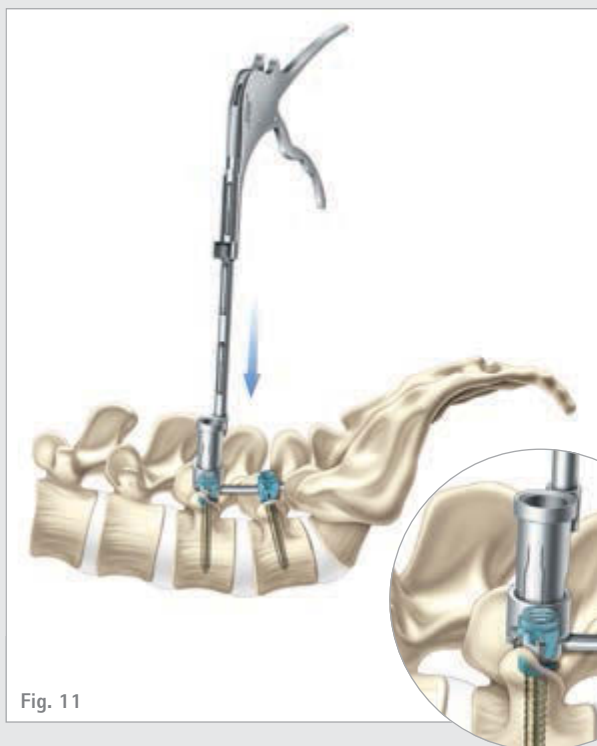


Fig. 11

b) Reduction by a Fork Rocker

For minor vertical adjustments to seat the rod into the pedicle screw body, the straight or curved Fork Rockers (FW288R or FW289R) may be used.

- Align the pins in the Fork Rocker with the line on the pedicle screw body, and fit into the under cut grooves on the medial and lateral edges. (Fig. 12)

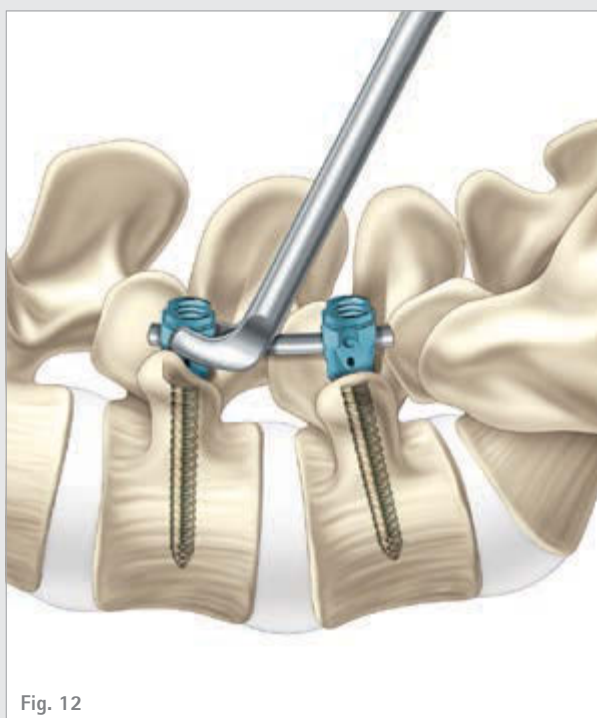


Fig. 12

AESCULAP® S4® ELEMENT

B | OPEN TECHNIQUE

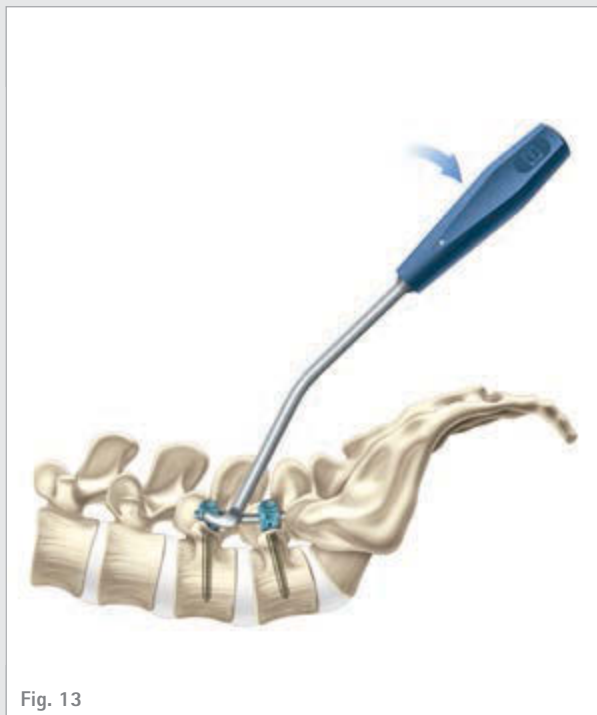


Fig. 13

b) Reduction by a Fork Rocker (continued)

- Push down on the handle of the Fork Rocker to lever the rod into the screw head. (Fig. 13)
- If necessary, the Rod Pusher (FW513R) can be used to push the rod into position.



Fig. 14

B.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. 14)

Note:

- The set screw must be fully engaged to the Set Screw Starter.

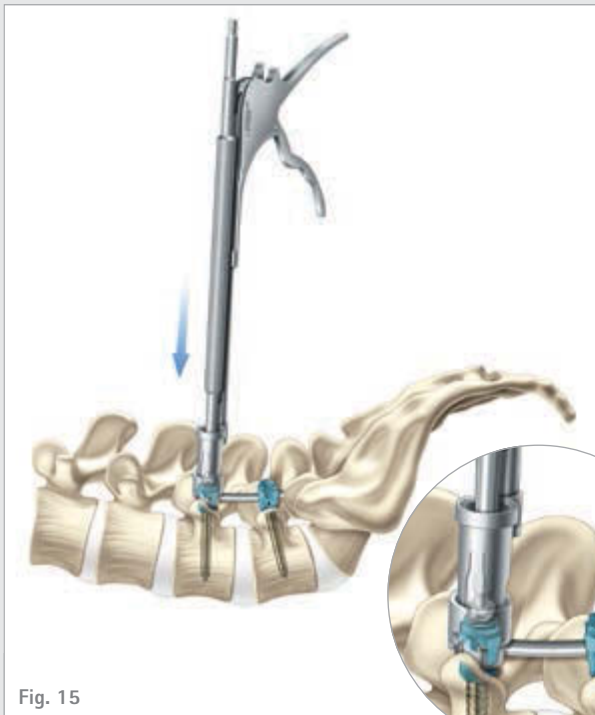


Fig. 15

Finger tighten the set screw into the screw body until it contacts the rod. (Fig. 15)

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.

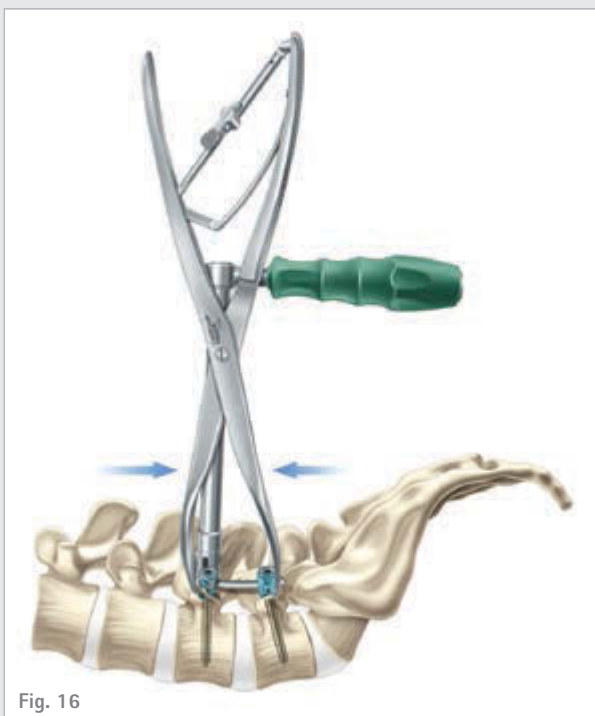


Fig. 16

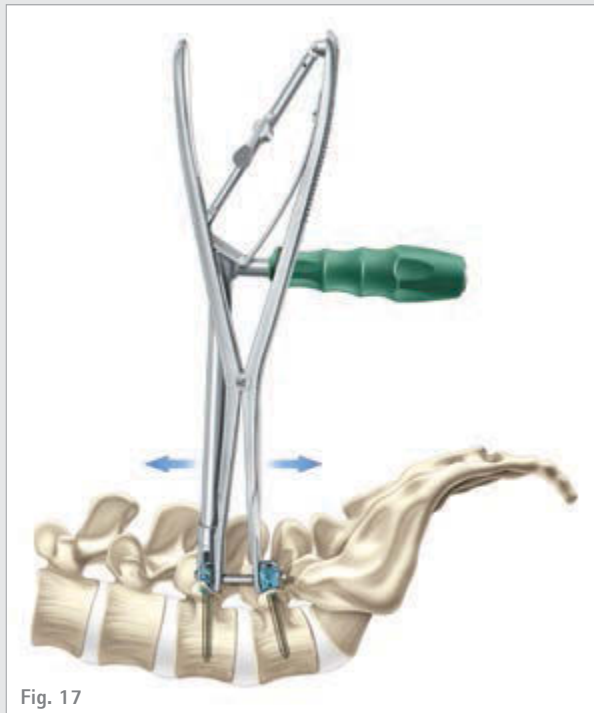
B.7. COMPRESSION MANEUVER

Use the Compression Forceps (FW282R) to compress the construct. (Fig. 16)

- Fully tighten one set screw to create a fixed point for compression.
- Fully seat the Counter Torque L-Handle (FW283R) or the Derotation Sleeves (FW287R) on the unlocked screw body and perform the compression maneuver.
- Once the desired compression is achieved, fully tighten the remaining set screw.

AESCULAP® S4® ELEMENT

B | OPEN TECHNIQUE



B.8. DISTRACTION MANEUVER

Use the Distraction Forceps (FW281R) to distract the construct. (Fig. 17)

- Fully tighten one set screw to create a fixed point for distraction.
- Fully seat the Counter Torque L-Handle (FW283R) or the Derotation Sleeves (FW287R) on the unlocked screw body and perform the distraction maneuver.
- Once the desired distraction is achieved, fully tighten the remaining set screw.



B.9. DEROTATION MANEUVER

Use the Derotation Sleeves (FW287R) and the Counter Torque L-Handle (FW283R) to rotate the rod. (Fig. 18)

- 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.

Caution:

- The Derotation Sleeves should be used during rotation maneuvers to prevent splaying of the screw head.



Fig. 19

B.10. FINAL TIGHTENING

Final tightening of each set screw is completed using the Torque Wrench (FW170R) along with the Counter Torque L-Handle (FW283R). (Fig. 19)

- Insert the 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 (FW170R) in a clockwise direction while firmly holding the counter torque.
- If using the Line-To-Line Torque Wrench (FW170R), 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. Damaged set screws must be replaced.
- Use the Set Screw Revision Screw Driver with the 4 mm hex tip (FW193R) to remove a previously tightened set screw if necessary.

Warning:

- Do not use the Torque 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.

AESCALAP[®] S4[®] ELEMENT

C | ADDENDUM: CROSS CONNECTOR APPLICATION

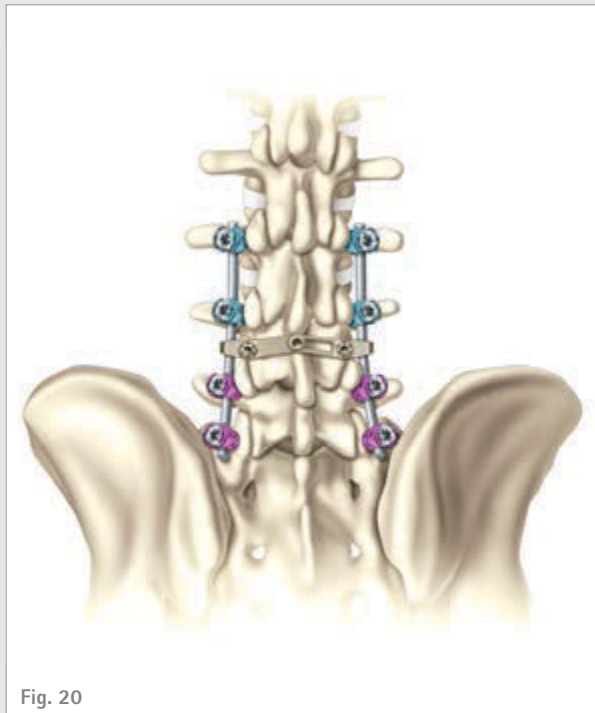


Fig. 20

C.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)



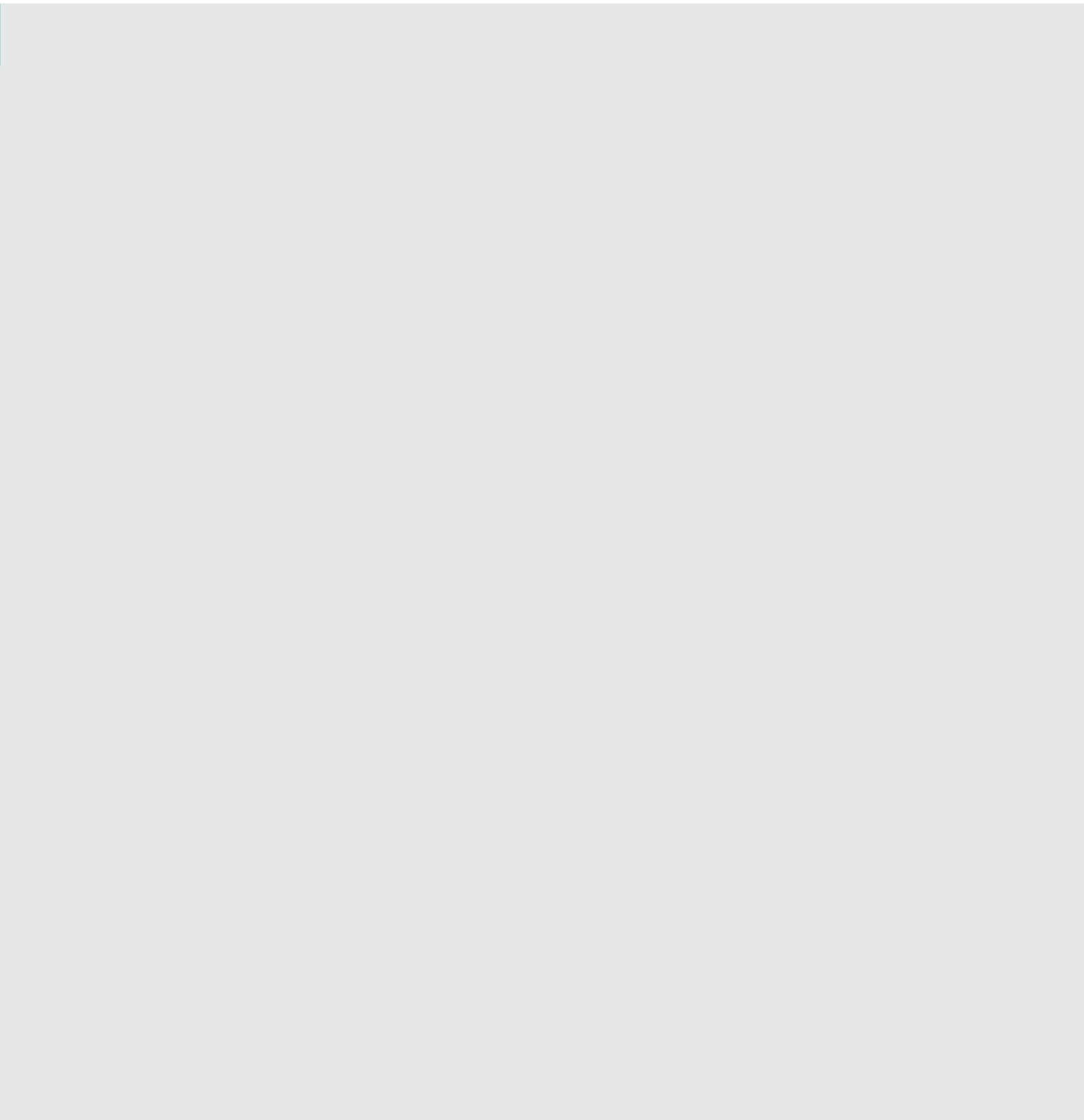
Fig. 21

- 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°.



AESCULAP® S4® ELEMENT

D | ADDENDUM: ROD-TO-ROD CONNECTOR APPLICATION

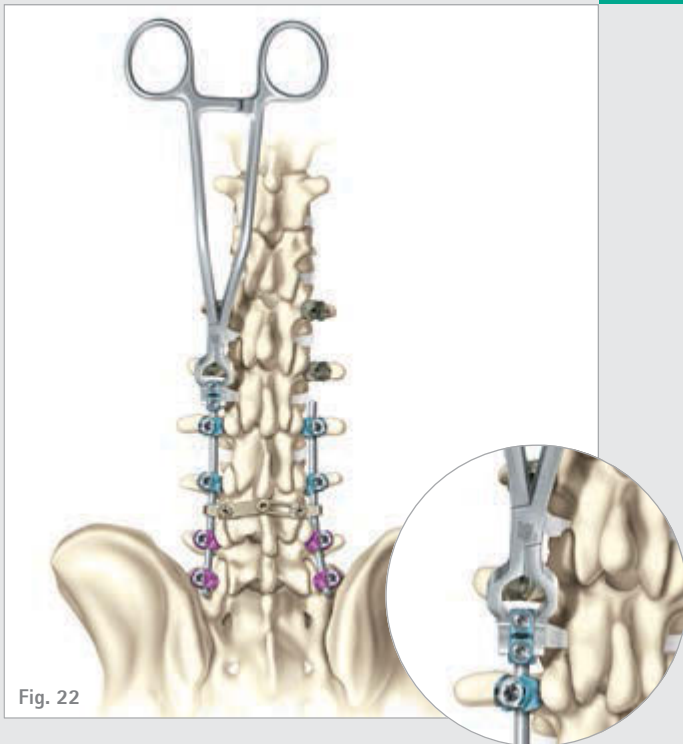


Fig. 22

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

D.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)

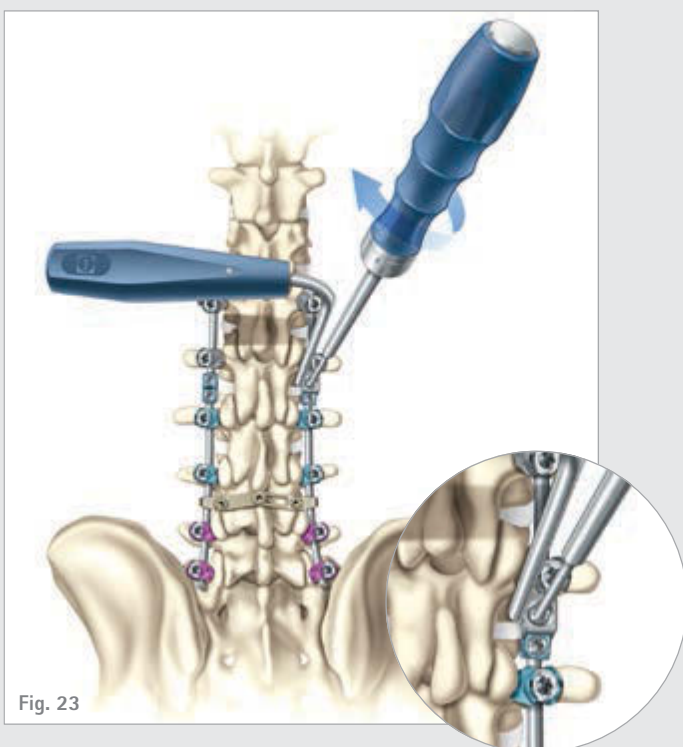


Fig. 23

- Final tighten by applying 4 Nm (36 in/lbs) of torque using the Cross Connector Torque Wrench (FW207R) and the Rod-To-Rod Connector Counter Torque Device (FW495R). (Fig. 23)

D.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)
- 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.

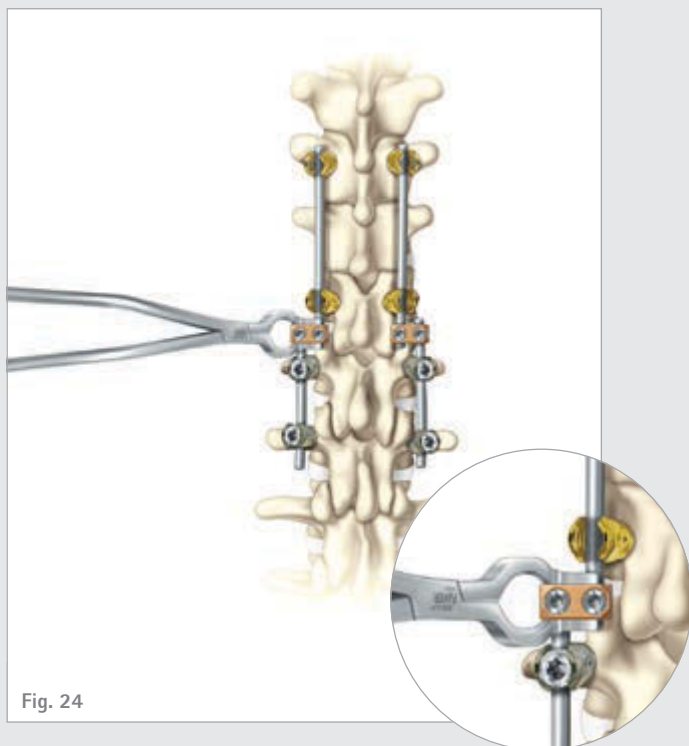


Fig. 24

- Final tighten by applying 4 Nm (36 in / lbs) of torque using the Cross Connector Torque Wrench (FW207R) and Rod-To-Rod Connector Counter Torque Device (FW495R). (Fig. 25)

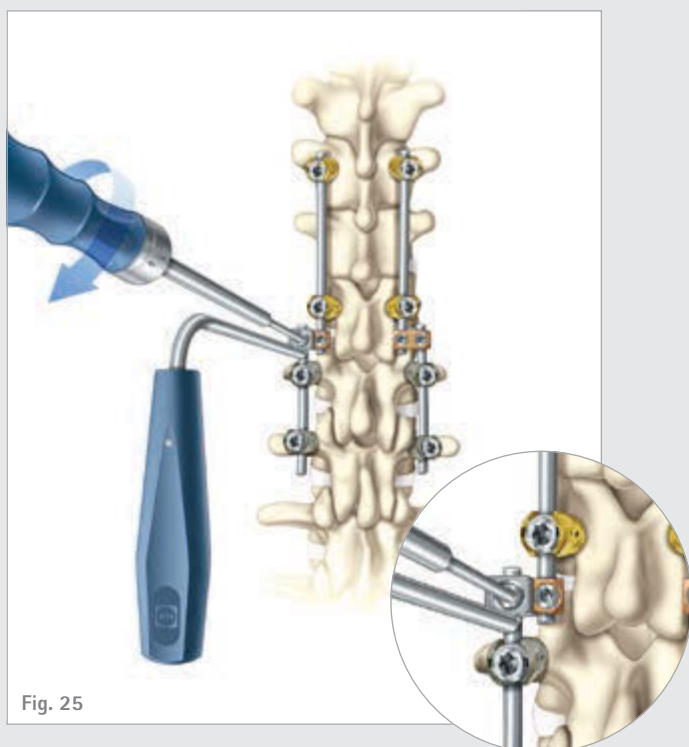


Fig. 25

AESCULAP® S4® ELEMENT

D | ADDENDUM: ROD-TO-ROD CONNECTOR APPLICATION



D.3. PELVIC SCREW & LATERAL OFFSET CONNECTOR APPLICATION

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

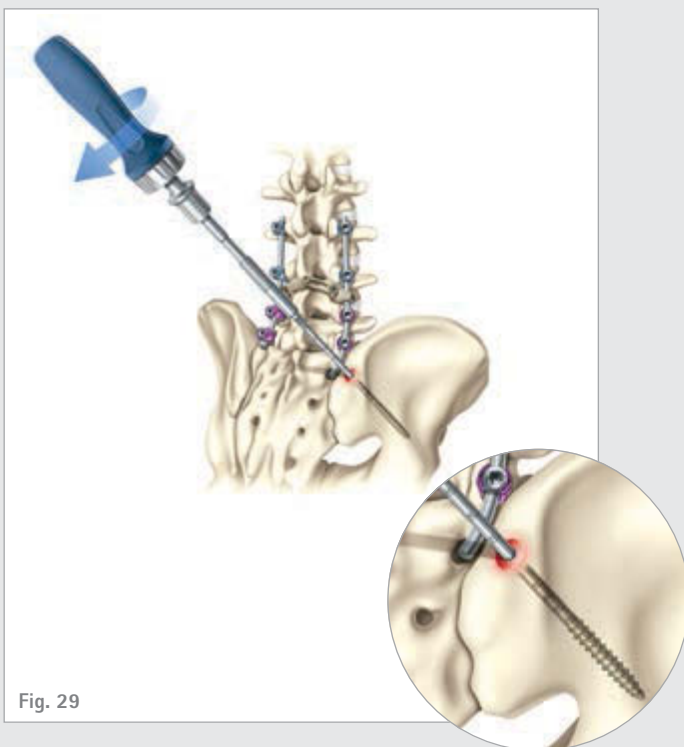
- Use a rongeur to make a notch in the crest of sufficient length and depth for the head of the iliac screw. (Fig. 26)



- 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)



- 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)



- 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)

AESCULAP® S4® ELEMENT

D | ADDENDUM: ROD-TO-ROD CONNECTOR APPLICATION

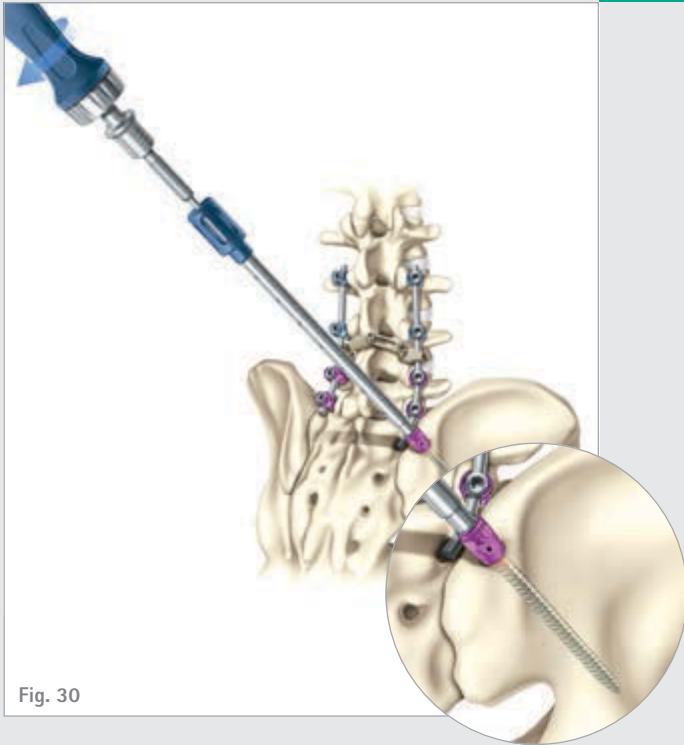


Fig. 30

- Attach desired handle to polyaxial Screw Driver (FW277R) and thread the screw into the ilium. (Fig. 30)

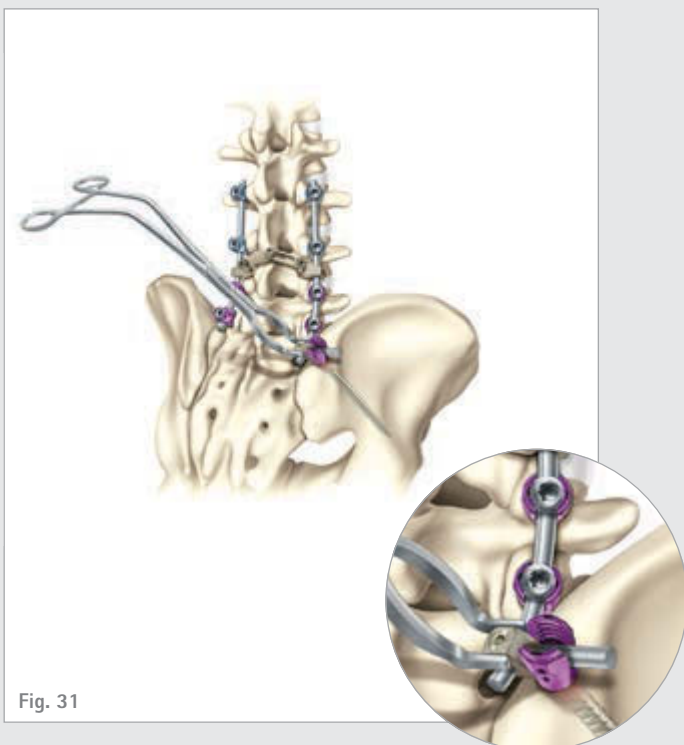


Fig. 31

- 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).
- 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 Cross Connector Torque Wrench (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.

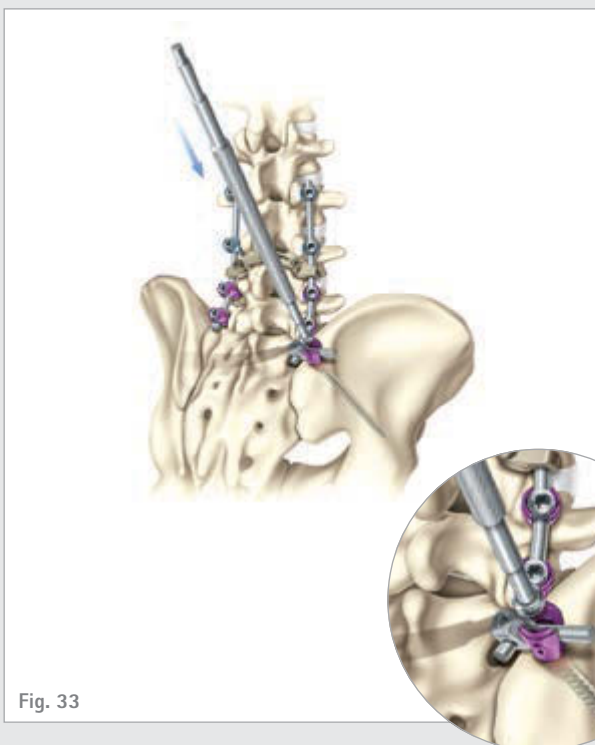


Fig. 33

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

AESCALAP[®] S4[®] ELEMENT

D | ADDENDUM: ROD-TO-ROD CONNECTOR APPLICATION

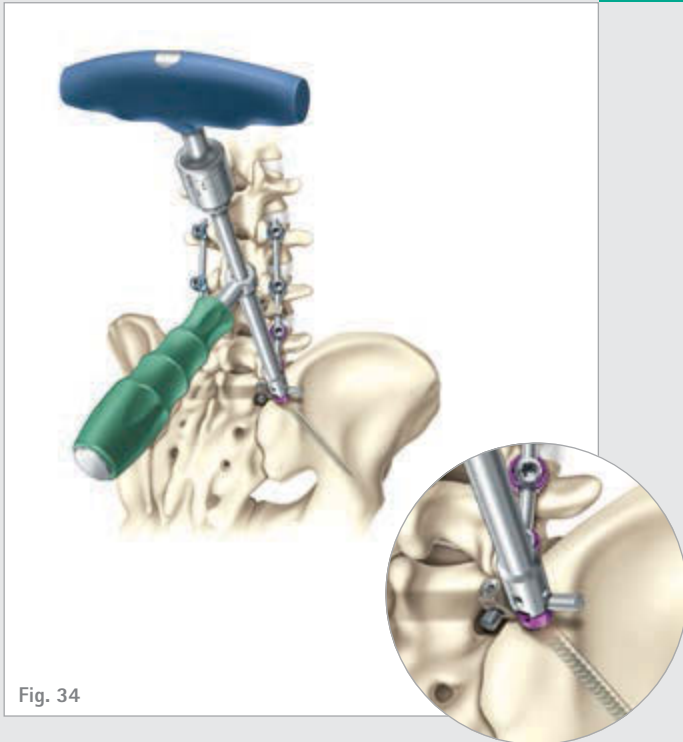
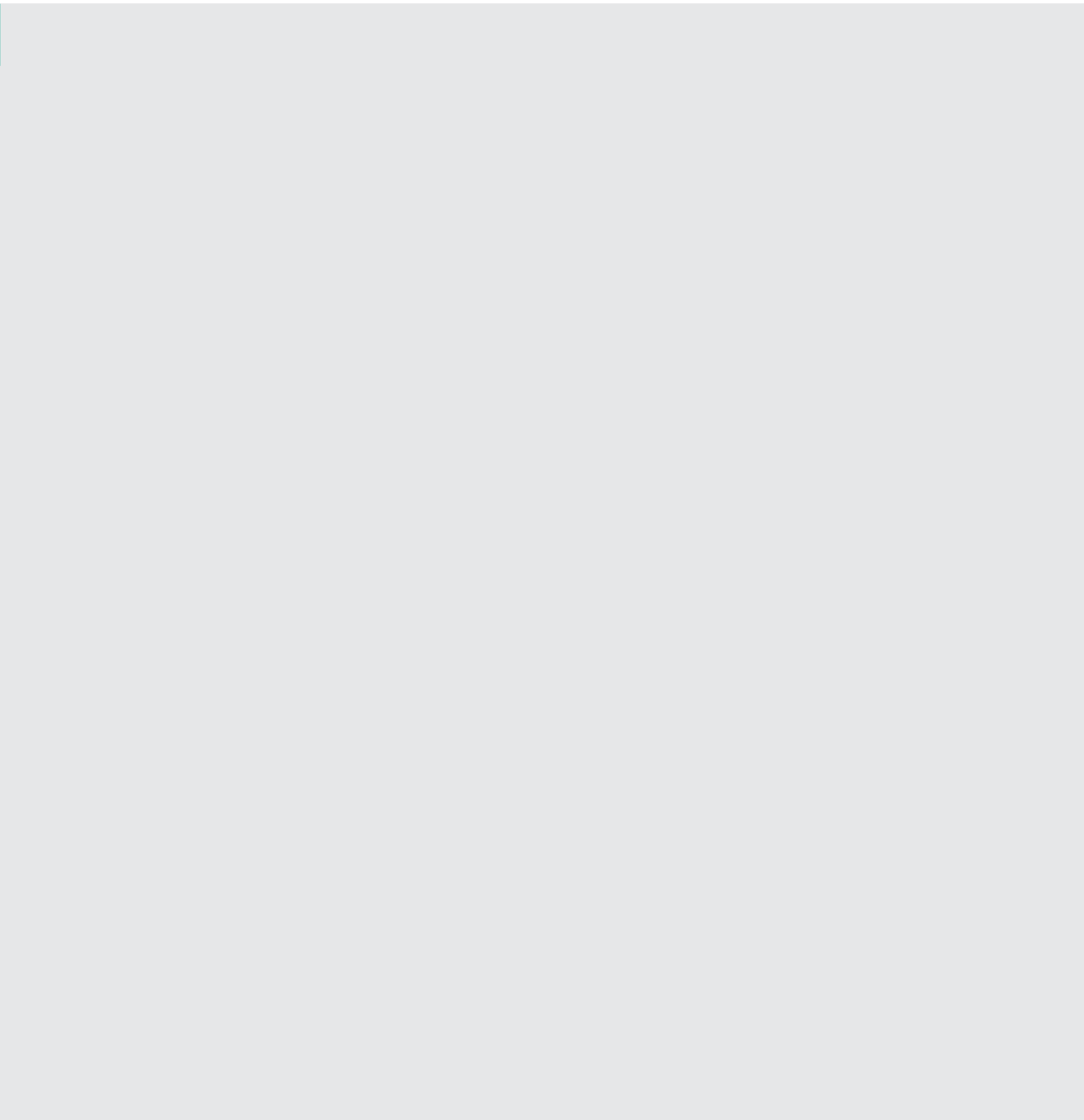


Fig. 34

- Final tightening of the set screw by using the clicking torque handle or the Line-To-Line Torque Wrench along with the Counter Torque L-Handle (as described in chapter B.10.). (Fig. 34)

Note:

- For removal of rod connector, use Connector Revision Screw Driver (FW491R). To remove pedicle screw, first use Set Screw Revision Screw Driver (FW193R) to disengage set screw and use Screw Driver with Shank Tip (FW174R) to remove the polyaxial screw.



AESCULAP® S4® ELEMENT

E | OPEN AUGMENTATION TECHNIQUE



Fig. 35

E.1. SCREW PLACEMENT

The placement of the screws is described in the previous chapter B.3. screw application.

Select the appropriate screw length. The contact with the anterior cortical wall should be avoided in order not to risk cement leakage.

It is recommended to place the augmentation screw over the K-wire to avoid unwanted penetration of bone into the augmentation area. The K-wire remains in place until the full placement of the screw. (Fig. 35)

Note:

- When the augmentation screws are being placed without K-wire, there is a risk of penetration of bone particles, which could interfere with the proper injection of the cement. Therefore it is necessary to check the path by introducing carefully a K-wire under image intensifier control.
- Align the monoaxial screws before introducing the cement. Afterwards, realignment is not possible.

Danger:

- It has to be avoided that the K-wire is pushed too far forward because there is danger of perforation of the aorta.

E.2. CANNULA ATTACHMENT

The augmentation cannula is placed over the K-wire, connected with the augmentation screw and hand tightened. The K-wire is removed afterwards. (Fig. 36)

Note:

- When introducing the augmentation cannula it is important to align the polyaxial screw vertically in order to avoid cross threading.
- For each augmentation screw one injection cannula (single use) is required.
- In order to avoid unwanted cement leakage make sure that there is a tight connection between cannula and applicator.



Fig. 36

AESCULAP® S4® ELEMENT

E | OPEN AUGMENTATION TECHNIQUE

E.3. CEMENT APPLICATION

Attach the cement applicator to the cannula. For cement application make sure that the consistency of the cement is according to the specifications of the manufacturers. (Fig. 37)

Note:

- It is important that there is no cement at the connection between applicator and cannula.
- When applying cement ensure that the cannula doesn't lose connection.
- Recommended cement quantity: 2 ml
- Cannula volume: 0.5 ml

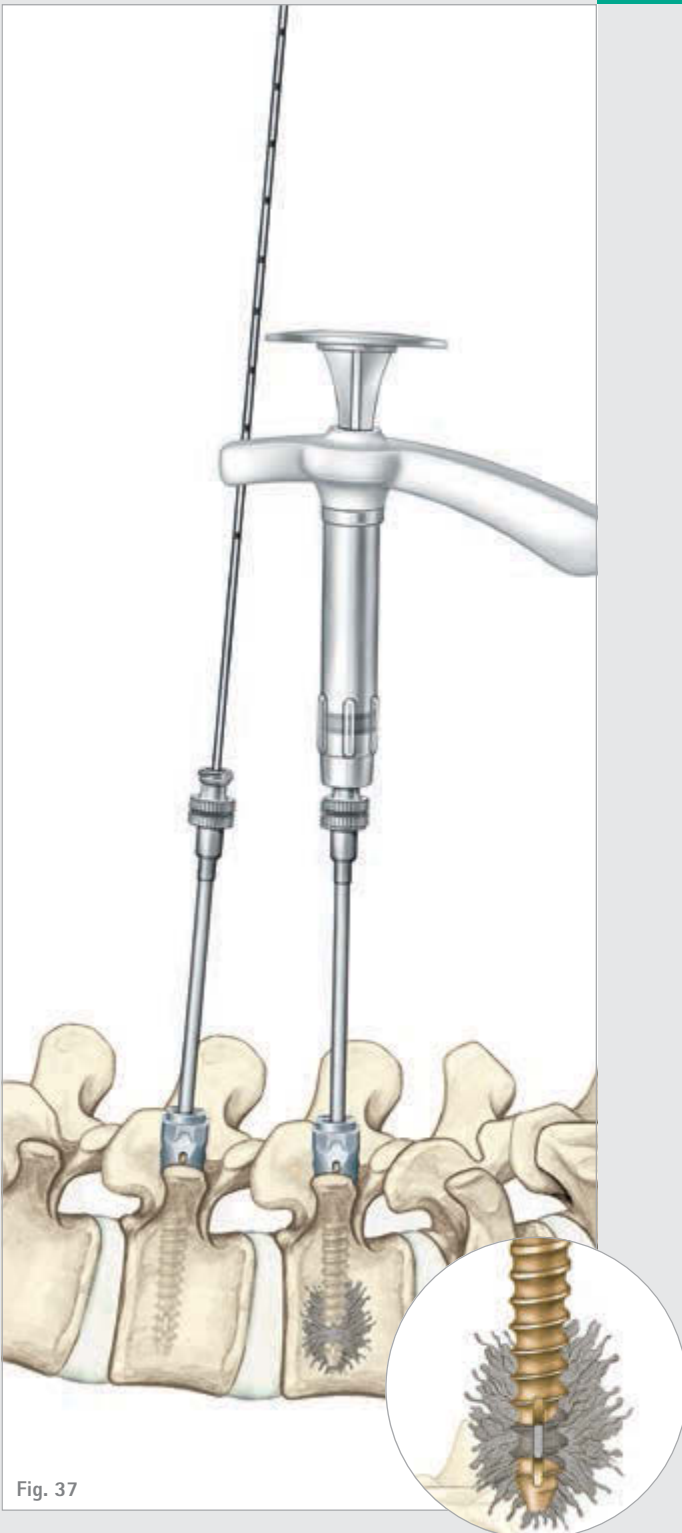


Fig. 37

Cement injection should be effected under real time image intensifier control:

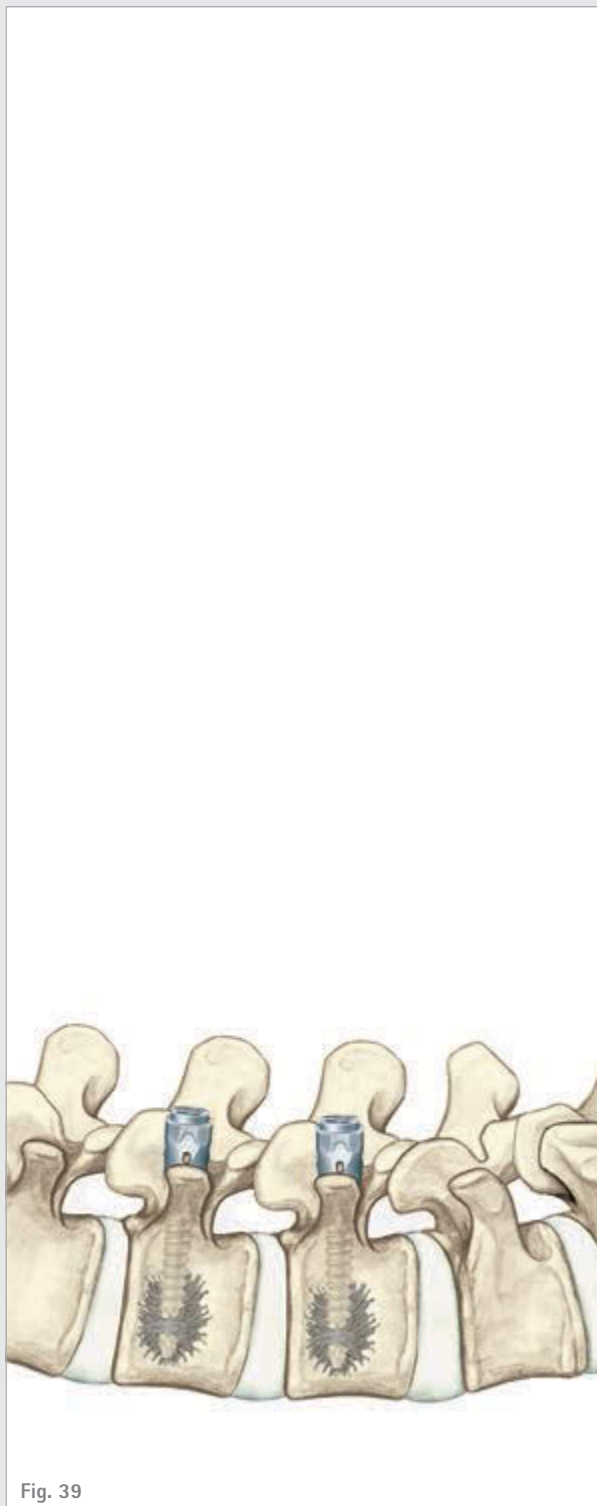
- Inject cement until it extrudes from the slots. Check that no cement leakage occurs.
- Continue the injection until the adequate quantity of cement is introduced and shows in a cloud pattern. (Fig. 38)



Fig. 38

AESCULAP® S4® ELEMENT

E | OPEN AUGMENTATION TECHNIQUE



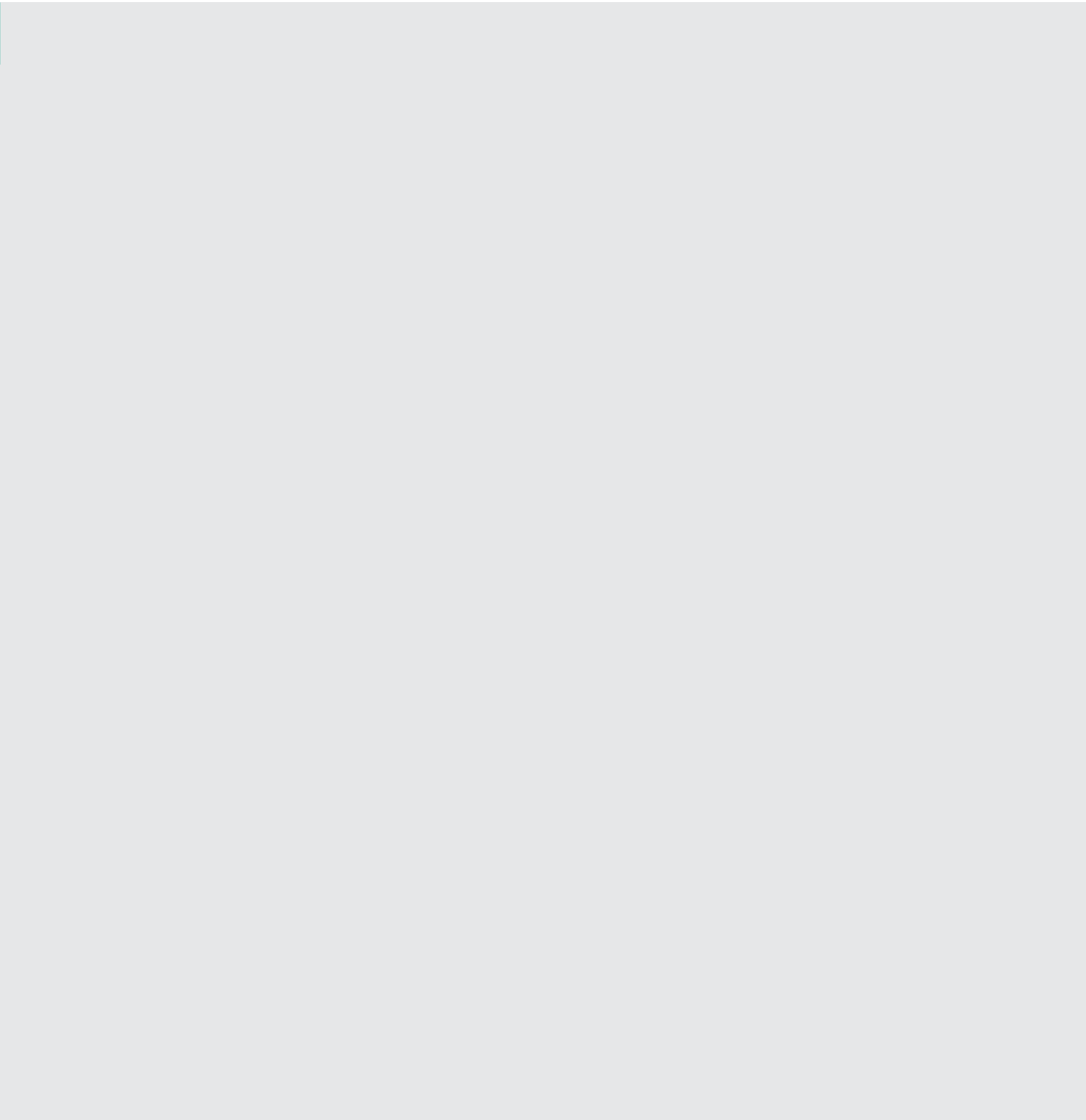
The cannula remains in the pedicle screw until the cement has hardened.

Otherwise there is a risk of contamination of the screw head. (Fig. 39)

Note:




- The manufacturers specifications for the cement hardening times have to be observed.



The next steps (rod positioning, insertion of the locking screw, ...) are described as previous chapters B.4. - B.10. of the open technique.



AESCALAP® S4® ELEMENT


F | IMPLANTS AND INSTRUMENTS OVERVIEW





POLYAXIAL SCREWS	Article No.	Description
	ST240T	4.5 x 25 mm
	ST241T	4.5 x 30 mm
	ST242T	S4® Element 4.5 x 35 mm
	ST243T	Polyaxial Screw, Ø 4.5 mm 4.5 x 40 mm
	ST244T	4.5 x 45 mm
	ST245T	4.5 x 50 mm
	ST250T	5.0 x 25 mm
	ST251T	5.0 x 30 mm
	ST252T	S4® Element 5.0 x 35 mm
	ST253T	Polyaxial Screw, Ø 5.0 mm 5.0 x 40 mm
	ST254T	5.0 x 45 mm
	ST255T	5.0 x 50 mm
	ST260T	6.0 x 25 mm
	ST261T	6.0 x 30 mm
	ST262T	6.0 x 35 mm
	ST263T	S4® Element 6.0 x 40 mm
	ST264T	Polyaxial Screw, Ø 6.0 mm 6.0 x 45 mm
	ST265T	6.0 x 50 mm
	ST266T	6.0 x 55 mm
	ST267T	6.0 x 60 mm

POLYAXIAL SCREWS	Article No.	Description	
	ST270T		7.0 x 25 mm
	ST271T		7.0 x 30 mm
	ST272T		7.0 x 35 mm
	ST273T		7.0 x 40 mm
	ST274T		7.0 x 45 mm
	ST275T		7.0 x 50 mm
	ST276T	S4 [®] Element Polyaxial Screw, Ø 7.0 mm	7.0 x 55 mm
	ST277T		7.0 x 60 mm
	ST230T		7.0 x 70 mm
	ST231T		7.0 x 80 mm
	ST232T		7.0 x 90 mm
	ST233T		7.0 x 100 mm
	ST234T		7.0 x 110 mm
		ST281T	
ST282T			8.0 x 35 mm
ST283T			8.0 x 40 mm
ST284T			8.0 x 45 mm
ST285T			8.0 x 50 mm
ST286T		S4 [®] Element Polyaxial Screw, Ø 8.0 mm	8.0 x 55 mm
ST287T			8.0 x 60 mm
ST235T			8.0 x 70 mm
ST236T			8.0 x 80 mm
ST237T			8.0 x 90 mm
ST238T			8.0 x 100 mm
ST239T			8.0 x 110 mm

AESCALAP® S4® ELEMENT


F | IMPLANTS AND INSTRUMENTS OVERVIEW

POLYAXIAL SCREWS	Article No.	Description	
	ST422T		5.5 x 35 mm
	ST423T	Polyaxial Screws for cement augmentation (sterile packed)	5.5 x 40 mm
	ST424T		5.5 x 45 mm
	ST425T		5.5 x 50 mm
	ST432T		6.5 x 35 mm
	ST433T		6.5 x 40 mm
	ST434T		6.5 x 45 mm
	ST435T	Polyaxial Screws for cement augmentation (sterile packed)	6.5 x 50 mm
	ST436T		6.5 x 55 mm
	ST437T		6.5 x 60 mm
	ST438T		6.5 x 70 mm
	ST439T		6.5 x 80 mm
	ST442T		7.5 x 35 mm
	ST443T		7.5 x 40 mm
	ST444T		7.5 x 45 mm
	ST445T	Polyaxial Screws for cement augmentation (sterile packed)	7.5 x 50 mm
	ST446T		7.5 x 55 mm
	ST447T		7.5 x 60 mm
	ST448T		7.5 x 70 mm
	ST449T		7.5 x 80 mm
	ST452T		8.5 x 35 mm
ST453T		8.5 x 40 mm	
ST454T		8.5 x 45 mm	
ST455T	Polyaxial Screws for cement augmentation (sterile packed)	8.5 x 50 mm	
ST456T		8.5 x 55 mm	
ST457T		8.5 x 60 mm	
ST458T		8.5 x 70 mm	
ST459T		8.5 x 80 mm	

MONOAXIAL SCREWS	Article No.	Description	
	ST340T		4.5 x 25 mm
	ST341T		4.5 x 30 mm
	ST342T	S4 [®] Element Monoaxial Screw, Ø 4.5 mm	4.5 x 35 mm
	ST343T		4.5 x 40 mm
	ST344T		4.5 x 45 mm
	ST345T		4.5 x 50 mm
	ST350T		5.0 x 25 mm
	ST351T		5.0 x 30 mm
	ST352T	S4 [®] Element Monoaxial Screw, Ø 5.0 mm	5.0 x 35 mm
	ST353T		5.0 x 40 mm
	ST354T		5.0 x 45 mm
	ST355T		5.0 x 50 mm
	ST360T		6.0 x 25 mm
	ST361T		6.0 x 30 mm
	ST362T		6.0 x 35 mm
	ST363T	S4 [®] Element Monoaxial Screw, Ø 6.0 mm	6.0 x 40 mm
	ST364T		6.0 x 45 mm
	ST365T		6.0 x 50 mm
	ST366T		6.0 x 55 mm
	ST367T		6.0 x 60 mm
	ST370T		7.0 x 25 mm
	ST371T		7.0 x 30 mm
	ST372T		7.0 x 35 mm
	ST373T	S4 [®] Element Monoaxial Screw, Ø 7.0 mm	7.0 x 40 mm
	ST374T		7.0 x 45 mm
	ST375T		7.0 x 50 mm
	ST376T		7.0 x 55 mm
	ST377T		7.0 x 60 mm

AESCALAP® S4® ELEMENT

F | IMPLANTS AND INSTRUMENTS OVERVIEW

MONOAXIAL SCREWS	Article No.	Description
	ST381T	8.0 x 30 mm
	ST382T	8.0 x 35 mm
	ST383T	8.0 x 40 mm
	ST384T	S4® Element Monoaxial Screw, Ø 8.0 mm
	ST385T	8.0 x 50 mm
	ST386T	8.0 x 55 mm
	ST387T	8.0 x 60 mm

MONOAXIAL SCREWS

Article No.

Description

ST462T

5.5 x 35 mm

ST463T

5.5 x 40 mm

ST464T

Monoaxial Screws for
cement augmentation
(sterile packed)

5.5 x 45 mm

ST465T

5.5 x 50 mm

ST472T

6.5 x 35 mm

ST473T

6.5 x 40 mm

ST474T

6.5 x 45 mm

ST475T

Monoaxial Screws for
cement augmentation
(sterile packed)

6.5 x 50 mm

ST476T

6.5 x 55 mm

ST477T

6.5 x 60 mm

ST478T

6.5 x 70 mm

ST479T

6.5 x 80 mm

ST482T

7.5 x 35 mm



ST483T

7.5 x 40 mm

ST484T

7.5 x 45 mm

ST485T

Monoaxial Screws for
cement augmentation
(sterile packed)

7.5 x 50 mm

ST486T

7.5 x 55 mm

ST487T

7.5 x 60 mm

ST488T

7.5 x 70 mm

ST489T

7.5 x 80 mm

ST492T

8.5 x 35 mm

ST493T

8.5 x 40 mm

ST494T

8.5 x 45 mm

ST495T

Monoaxial Screws for
cement augmentation
(sterile packed)

8.5 x 50 mm

ST496T

8.5 x 55 mm

ST497T

8.5 x 60 mm

ST498T



8.5 x 70 mm




ST499T

8.5 x 80 mm

AESCALAP® S4® ELEMENT







F | IMPLANTS AND INSTRUMENTS OVERVIEW










RODS	Article No.	Description	
	SW653T	5.5 x 30 mm	
	SW654T	5.5 x 35 mm	
	SW655T	5.5 x 40 mm	
	SW656T	5.5 x 45 mm	
	SW657T	5.5 x 50 mm	
	SW658T	S4® Pre-Bent Rods, Ø 5.5 mm	5.5 x 55 mm
	SW659T		5.5 x 60 mm
	SW661T		5.5 x 70 mm
	SW662T		5.5 x 80 mm
	SW663T		5.5 x 90 mm
	SW684T		5.5 x 100 mm
			SW674T
SW675T			5.5 x 40 mm
SW676T			5.5 x 45 mm
SW677T			5.5 x 50 mm
SW678T			5.5 x 55 mm
SW679T			5.5 x 60 mm
SW681T		5.5 x 70 mm	
SW682T		S4® Straight Rods, Ø 5.5 mm	5.5 x 80 mm
SW664T			5.5 x 100 mm
SW666T			5.5 x 120 mm
SW667T			5.5 x 150 mm
SW668T			5.5 x 180 mm
SW669T			5.5 x 200 mm
SW670T			5.5 x 300 mm
SW671T	5.5 x 400 mm		
SW672T	5.5 x 500 mm		

CROSS CONNECTORS AND SET SCREW	Article No.	Description	
	SW488T	35 - 36 mm	
	SW489T	36 - 38 mm	
	SW494T	38 - 42 mm	
	SW495T	42 - 50 mm	
	SW496T	S4 [®] Cross Connectors, adjustable	50 - 60 mm
	SW497T		60 - 77 mm
	SW498T	77 - 107 mm	
	SW697T	43 - 49 mm	
	SW698T	49 - 60 mm	
	SW699T	60 - 75 mm	
	SW490T	28 mm	
	SW491T	30 mm	
	SW492T	32 mm	
	SW493T	S4 [®] Rigid Cross Connectors, straight	34 mm
	SW690T		21 mm
	SW691T	25 mm	
	SW695T	38 mm	
	SW696T	41 mm	
	SW790T	S4 [®] Set Screw for monoaxial-/ polyaxial screws	

AESCALAP[®] S4[®] ELEMENT





F | IMPLANTS AND INSTRUMENTS OVERVIEW












ROD-TO-ROD CONNECTORS	Article No.	Description
		All rod-to-rod connectors available as both non-sterile and sterile packed implants. Sterile packed article nr. SW838TS - SW871TS
	SW842T	7 mm
	SW844T	Closed Domino Connector 11 mm
	SW841T	7 mm
	SW843T	Closed/Open Domino Connector 11 mm
	SW838T	Short Axial Connector
	SW839T	Long
	SW847T	20 mm
	SW849T	Closed Lateral Offset Connector 35 mm
	SW872T	50 mm
	SW846T	20 mm
	SW848T	Open Lateral Offset Connector 35 mm
	SW871T	50 mm

INSTRUMENTS	Article No.	Description
	FW190R	Bone Awl
	FW188R	Straight Pedicle Probe
	FW189R	Curved Pedicle Probe
	FW248R	Straight Lenke Probe
	FW249R	Curved Lenke Probe
	FW146R	Straight Pedicle Sounder
	FW147R	Curved Pedicle Sounder
	FW191R	Single Band Pedicle Marker
	FW192R	Dual Band Pedicle Marker

AESCALAP[®] S4[®] ELEMENT








F | IMPLANTS AND INSTRUMENTS OVERVIEW








INSTRUMENTS	Article No.	Description
	FW165R	S4 [®] Ratchet Handle blue straight
	FW167R	S4 [®] Cannulated T-Handle for screw driver
 	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

INSTRUMENTS	Article No.	Description
	FW277R	S4° Element Polyaxial Screw Driver
	FW276R	S4° Element Monoaxial Screw Driver
	FW278R	Screw Body Manipulator
	FW174R	Removal Screw Driver with shank tip
	FW193R	Set Screw Revision Screw Driver
	FW279R	Dual Ended Set Screw Starter
	FW251R	Handled Set Screw Starter
	FW285R	S4° Element Rod Persuader
	FW485R	S4° Element Detachable Rod Persuader
	FW288R	S4° Element Fork Rocker straight
	FW289R	S4° Element Fork Rocker curved

AESCULAP® S4® ELEMENT









F | IMPLANTS AND INSTRUMENTS OVERVIEW

INSTRUMENTS	Article No.	Description
	FW283R	Counter Torque L-Handle
	FW170R	Line-to-Line Torque Wrench
	FW154R	Marnay Lever
	FW185R	Flexible Rod Trial
	FW024R	French Rod Bender
	FW012R	Rod Holding Forceps
	FW513R	Rod Pusher

INSTRUMENTS	Article No.	Description
	FW281R	Distraction Forceps
	FW282R	Compression Forceps Distraction
	FW287R	Derotation Sleeve
	FW202R	Cross Connector Sizing Template
	FW203R	Cross Connector Bender
	FW204R	Cross Connector Counter Torque
	FW207R	Cross Connector Torque Wrench, 4 Nm

AESCULAP® S4® ELEMENT

F | IMPLANTS AND INSTRUMENTS OVERVIEW

INSTRUMENTS	Article No.	Description
	FW493R	Rod-To-Rod Connector Inserter
	FW495R	Rod-To-Rod Connector Counter-Torque
	FW497R	Extended Length Screw Tap, 7.0 mm
	FW498R	Extended Length Screw Tap, 8.0 mm
	FW474R	Extended Length Thoracic Probe, straight
	FW475R	Extended Length Thoracic Probe, curved
	FW476R	Extended Length Bone Probe, straight
	FW477R	Extended Length Bone Probe, curved

INJECTION CANNULA

Article No.

Description



SR146SU

S4° Injection Cannula, short, 100 mm

AESCULAP® – a B. Braun brand

Aesculap AG | Am Aesculap-Platz | 78532 Tuttlingen | Germany
Phone +49 7461 95-0 | Fax +49 7461 95-2600 | www.aesculap.com

The main product trademark "Aesculap" and the product trademarks "S4", "Hydrolift", "PROSPACE", "TSPACE" and "Arcadius XP L" are registered trademarks of Aesculap AG.

Subject to technical changes. All rights reserved. This brochure may only be used for the exclusive purpose of obtaining information about our products. Reproduction in any form partial or otherwise is not permitted.