

Interbody fusion cage for the transforaminal approach

Travios

Surgical Technique



 Image intensifier control

This description alone does not provide sufficient background for direct use of DePuy Synthes products. Instruction by a surgeon experienced in handling these products is highly recommended.

Reprocessing, Care and Maintenance

For general guidelines, function control and dismantling of multi-part instruments, please contact your local sales representative or refer to:
<http://emea.depuyshnthes.com/hcp/reprocessing-care-maintenance>

For general information about reprocessing, care and maintenance of Synthes reusable devices, instrument trays and cases, please consult the Important Information leaflet (SE_023827) or refer to:
<http://emea.depuyshnthes.com/hcp/reprocessing-care-maintenance>

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Indications and Contraindications

The Travios implant is designed for a transforaminal lumbar interbody fusion (TLIF).

Indications

Indications are lumbar and lumbosacral pathologies in which segmental spondylodesis is indicated, for example:

- Degenerative disc diseases and spinal instabilities
- Revision procedures for post-discectomy syndrome
- Pseudarthrosis or failed spondylodesis
- Degenerative spondylolisthesis
- Isthmic spondylolisthesis

Note: Travios should only be applied in combination with posterior fixation.

Contraindications

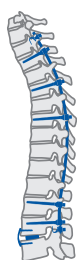
- Vertebral body fractures
- Spinal tumours
- Major spinal instabilities
- Primary spinal deformities
- Osteoporosis

AO Spine Principles

The four principles to be considered as the foundation for proper spine patient management underpin the design and delivery of the Curriculum: Stability – Alignment – Biology – Function.^{1,2}

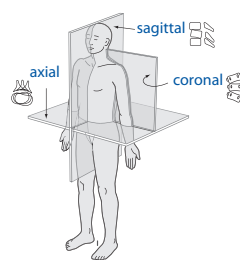
Stability

Stabilization to achieve a specific therapeutic outcome



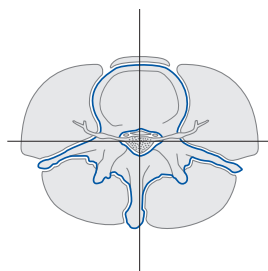
Alignment

Balancing the spine in three dimensions



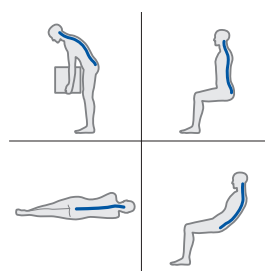
Biology

Etiology, pathogenesis, neural protection, and tissue healing



Function

Preservations and restoration of function to prevent disability



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¹ Aebi et al (1998)

² Aebi et al (2007)

Travios Implant Overview Chart

Travios cages are available in 9 heights in PEEK and 6 heights in Titanium Alloy (TAN).

The Travios (PEEK) cages are radiolucent and incorporate two X-ray markers. They are positioned at the two lateral ends of the implant.

The Travios system contains a dedicated trial implant for each implant height (including the teeth).

Travios Cages (10 × 27 mm)		PEEK
Height	Implant sterile packed	Trial implant
7 mm	889.834S	389.267
8 mm	08.804.008S	03.806.008
9 mm	889.835S	389.268
10 mm	08.804.010S	03.806.010
11 mm	889.836S	389.269
12 mm	08.804.012S	03.806.012
13 mm	889.837S	389.271
15 mm	889.838S	389.272
17 mm	889.839S	389.273

Travios Cages (10 × 30 mm)		PEEK
Height	Implant sterile packed	Trial implant
7 mm	08.804.037S	389.267
8 mm	08.804.038S	03.806.008
9 mm	08.804.039S	389.268
10 mm	08.804.040S	03.806.010
11 mm	08.804.041S	389.269
12 mm	08.804.042S	03.806.012
13 mm	08.804.043S	389.271
15 mm	08.804.045S	389.272
17 mm	08.804.047S	389.273



Travios Cages (10 × 33 mm)		PEEK
Height	Implant sterile packed	Trial implant
7 mm	08.804.067S	389.267
8 mm	08.804.068S	03.806.008
9 mm	08.804.069S	389.268
10 mm	08.804.070S	03.806.010
11 mm	08.804.071S	389.269
12 mm	08.804.072S	03.806.012
13 mm	08.804.073S	389.271
15 mm	08.804.075S	389.272
17 mm	08.804.077S	389.273

Travios Cages (12 × 27 mm)		PEEK
Height	Implant sterile packed	Trial implant
7 mm	08.804.107S	389.267
8 mm	08.804.108S	03.806.008
9 mm	08.804.109S	389.268
10 mm	08.804.110S	03.806.010
11 mm	08.804.111S	389.269
12 mm	08.804.112S	03.806.012
13 mm	08.804.113S	389.271
15 mm	08.804.115S	389.272
17 mm	08.804.117S	389.273

**Travios Cages PEEK
(12 × 30 mm)**

Height	Implant sterile packed	Trial implant
7 mm	08.804.137S	389.267
8 mm	08.804.138S	03.806.008
9 mm	08.804.139S	389.268
10 mm	08.804.140S	03.806.010
11 mm	08.804.141S	389.269
12 mm	08.804.142S	03.806.012
13 mm	08.804.143S	389.271
15 mm	08.804.145S	389.272
17 mm	08.804.147S	389.273

**Travios Cages PEEK
(12 × 33 mm)**

Height	Implant sterile packed	Trial implant
7 mm	08.804.167S	389.267
8 mm	08.804.168S	03.806.008
9 mm	08.804.169S	389.268
10 mm	08.804.170S	03.806.010
11 mm	08.804.171S	389.269
12 mm	08.804.172S	03.806.012
13 mm	08.804.173S	389.271
15 mm	08.804.175S	389.272
17 mm	08.804.177S	389.273

**Travios Cages TAN
(10 × 27 mm)**

Height	Implant sterile packed	Trial implant
7 mm	489.901S	389.267
9 mm	489.902S	389.268
11 mm	489.903S	389.269
13 mm	489.904S	389.271
15 mm	489.905S	389.272
17 mm	489.906S	389.273

Surgical Technique

The surgical technique is described using the example of a transforaminal approach to L4/L5.

1. Preoperative planning

An estimate of the appropriate Travios cage size should be made prior to surgery.

The initial estimate of correct cage height can be made by comparing the Preoperative Planning Template for Travios (X000009) with the adjacent intervertebral discs on a lateral radiograph.

With the segment fully distracted, the implant must fit tightly and accurately between the endplates. To achieve maximal segment stability, it is essential to implant the largest possible cage. The final choice of size will be made with the help of a trial implant during surgery (see step 8).

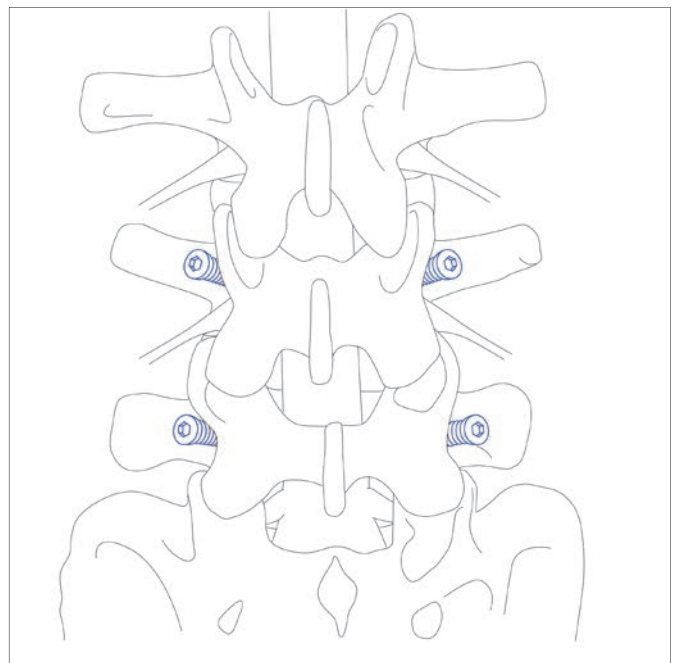
2. Position the patient

In transforaminal lumbar surgery, the patient is positioned in restored physiological lordosis.

3. Make incision and insert fixation screws

Make incision after viewing radiograph of the segment. Retract the muscle layer and insert Click'X, VAS or USS screws.

Click'X screws are used in this example (see illustration).



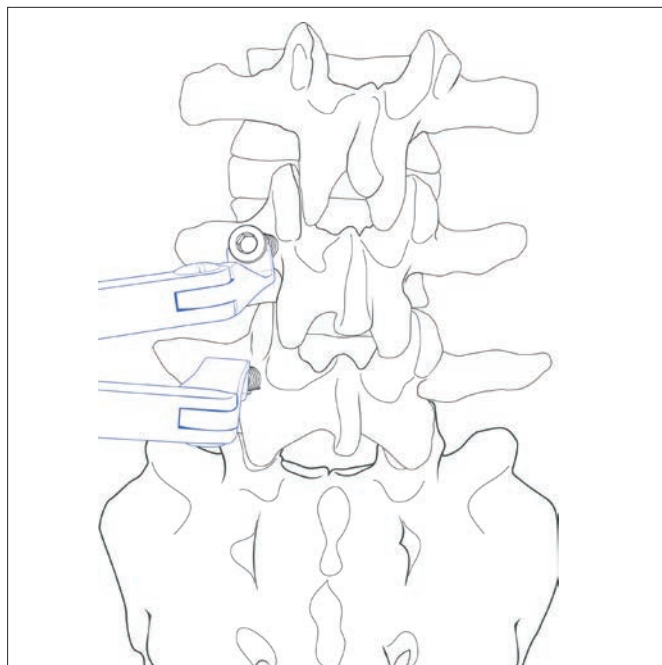
4. Distract intervertebral disc space

Alternative 1

Position the Distractor for Click'X, VAS and USS screws (388.414) between the fixation screw heads on the appropriate side, with the instrument handle oriented away from the spine.

Ensure that the distractor tips are correctly positioned below the screw heads (see illustration) to prevent slipping.

Apply distraction.

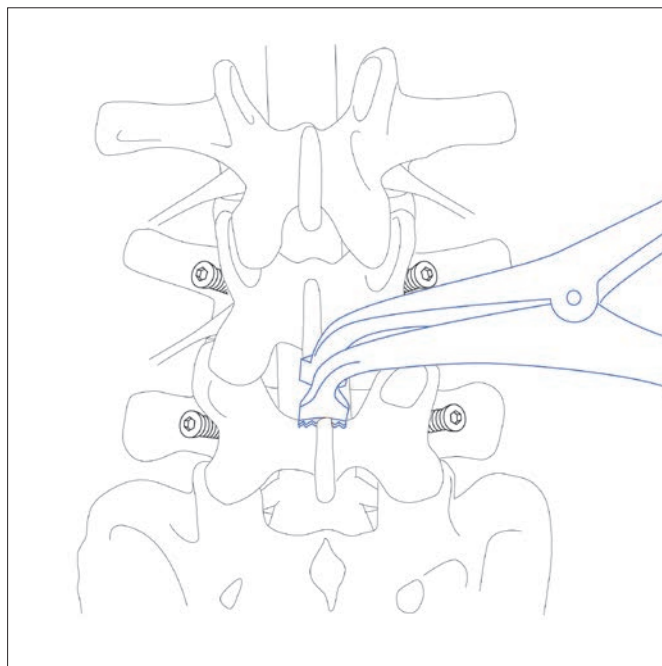


Alternative 2

Position the Lamina Spreader for TraviOS (389.265) at the base of the spinous processes.

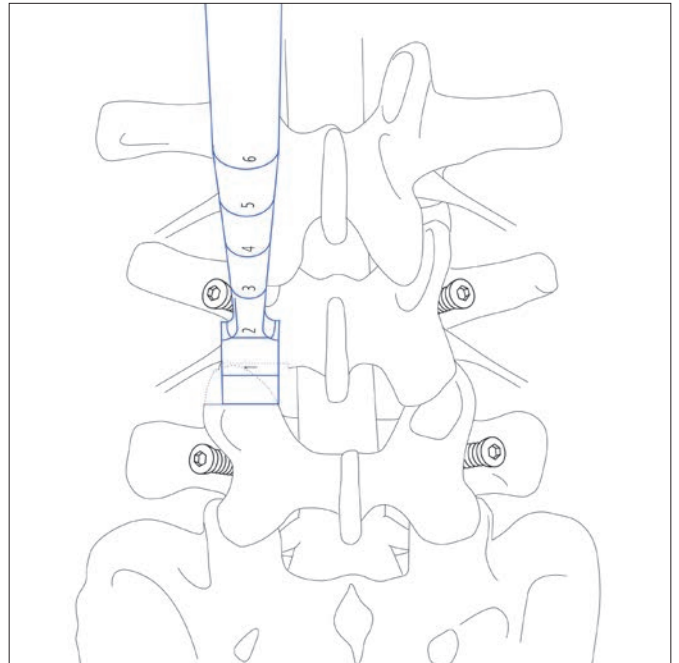
Apply distraction.

These two distraction methods open the posterior disc space and promote exposure both for decompression and delivery of the implant.



5. Cut the transforaminal window

Prepare a window for transforaminal approach, using the Osteotomes (389.276, 389.277) to remove the inferior facet of the cranial vertebra and the superior facet of the caudal vertebra.



6. Prepare disc space

Access the foramen and use Bone Curettes (389.278–389.284) to remove disc material through an incision in the annulus fibrosus.

For simplified removal of tissue in the far lateral disc space, use the left- and right-angled bone curettes.

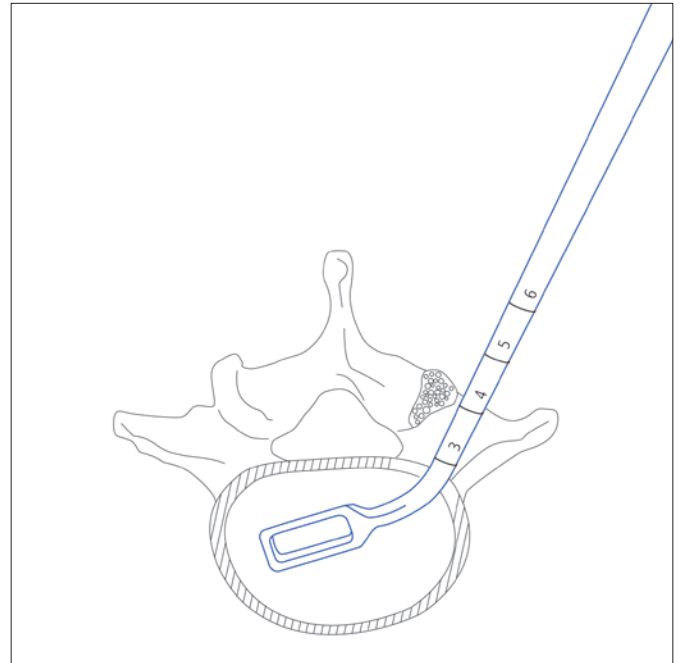
The annulus must be preserved to provide additional support for the TraviOS cage.

Remove cartilaginous layers from the surface of the vertebral endplates with a Bone Rasp (389.285, 389.286) until bleeding bone is attained.

Sufficient cleaning of the endplates is essential for vascular supply to the bone graft; yet excessive cleaning could damage the denser bone layer and weaken the endplate.

Note: Before the TraviOS cage is implanted, the anterior and lateral disc space should be filled with either autologous bone (harvested for example from the iliac crest) or bone graft substitute.

The Funnel for Cancellous Bone Graft \varnothing 8.0 mm (394.562) with the matching Cancellous Bone Impactor \varnothing 8.0 mm (394.572), as well as the Cancellous Bone Impactor (394.579) can be used for this procedure (see step 13).



7. Select the TraviOS trial implant

Select the trial implant corresponding to the preoperatively estimated height of the disc space and attach a T-Handle with Quick Coupling (394.951).

Trial implants	Height
389.267	7 mm
03.806.008	8 mm
389.268	9 mm
03.806.010	10 mm
389.269	11 mm
03.806.012	12 mm
389.271	13 mm
389.272	15 mm
389.273	17 mm

8. Insert a trial implant to verify size

Carefully insert the selected TraviOS trial implant via the transforaminal window into the disc space, applying gentle impaction.

Check the position of the trial implant under the image intensifier.

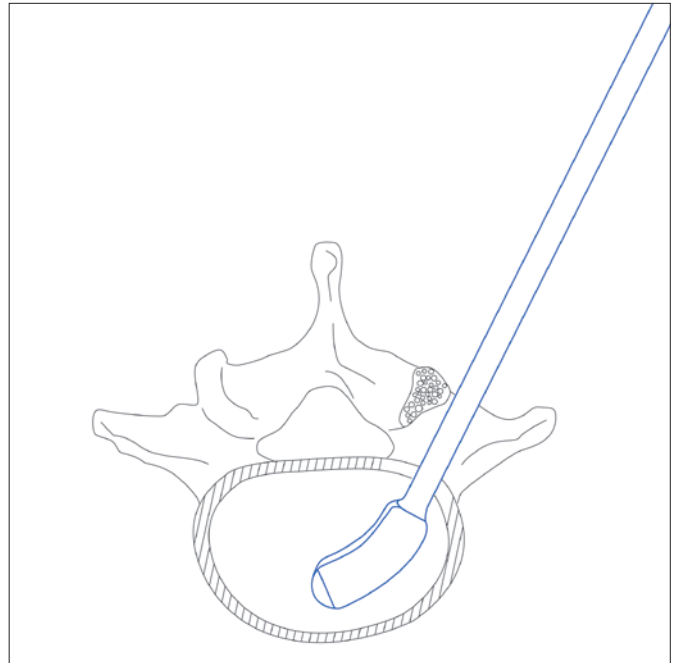
With the segment fully distracted, the trial implant must fit tightly and accurately between the endplates in order to ensure that disc height will be preserved when the distraction is released.

Using the largest possible implant maximises segment stability by creating tension on the longitudinal ligament and the annulus fibrosus.

If the trial implant does not completely fill the intervertebral space, try the next larger size. If the trial implant cannot be inserted, try the next smaller size.

When the correct TraviOS cage size has been determined, distraction can be temporarily released.

Note: The trial implants are not for implantation and must be removed prior to insertion of the TraviOS cage.



9. Select the appropriate Travios cage and attach the implant holder

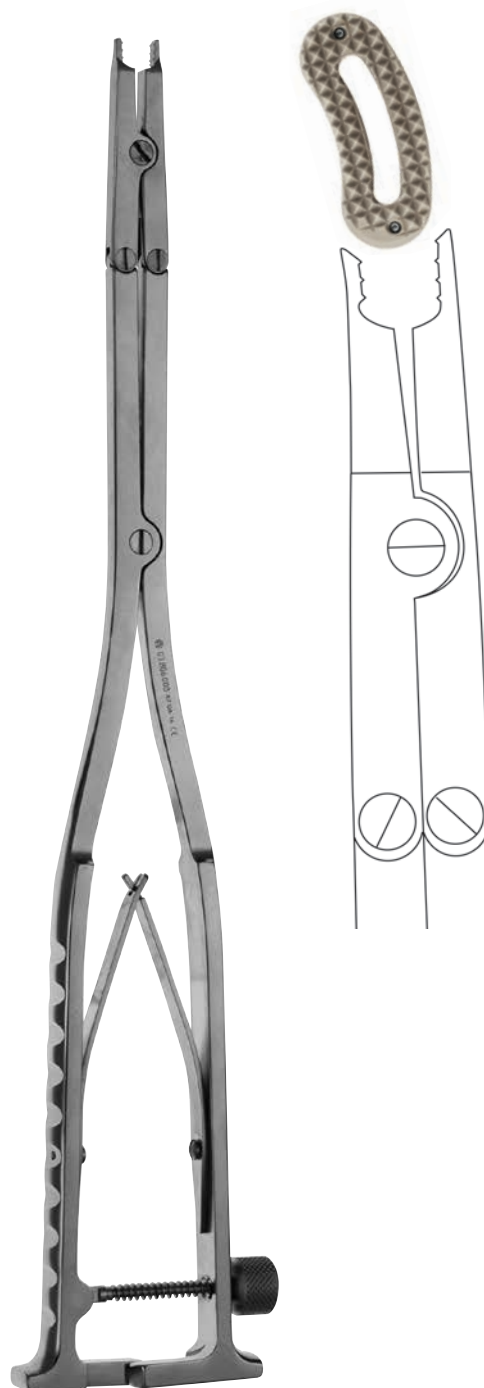
Select a Travios cage (see pages 4–6) corresponding to the trial implant size determined in step 8.

Attach the Implant Holder, wide, for Travios (03.806.000) to the serrated slots on the cage.

Tighten the speed nut on the handle.

Ensure that the cage is held flush against the holder neck and is attached securely in its jaws.

Note: The shorter jaw of the holder (the side with 3 teeth) must be placed on the concave side of the implant (see illustration).

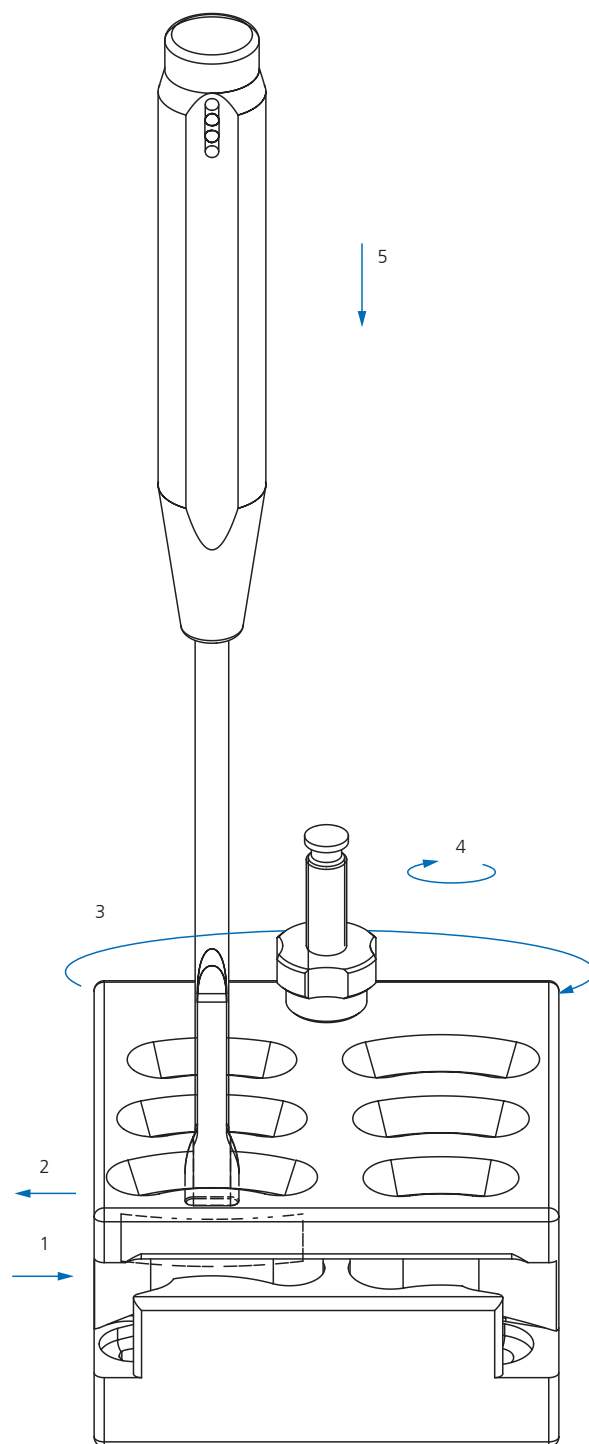


10. Pack the cage with cancellous bone graft or cancellous bone graft substitute

Fill the cage with bone graft material as follows:

1. Open the Packing Block for TraviOS (03.804.001) and insert the cage attached to the implant holder.
2. Remove the implant holder.
3. Close the packing block.
4. Tighten the knurled nut securely.
5. Use the Cancellous Bone Impactor (389.288) to introduce and pack the bone graft material or bone graft substitute into the cage.

The cage must be filled completely.

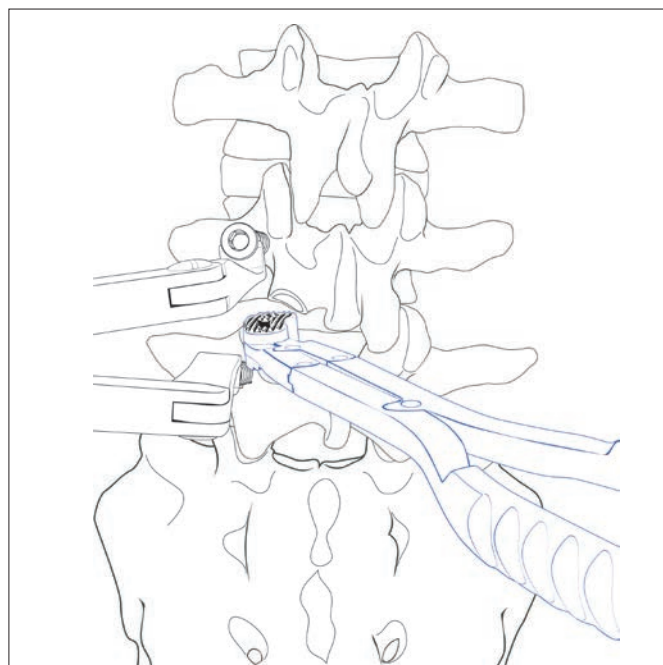


11. Implant the Travios cage

When the cage is ready for implantation, distract the segment again.

Ensure that the orientation of the implant is correct (see illustration below right) and then insert the cage into the intervertebral disc space.

Slight impaction on the implant holder may be necessary.



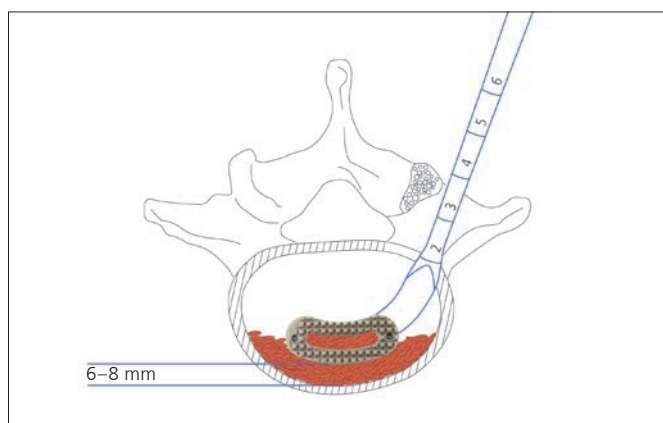
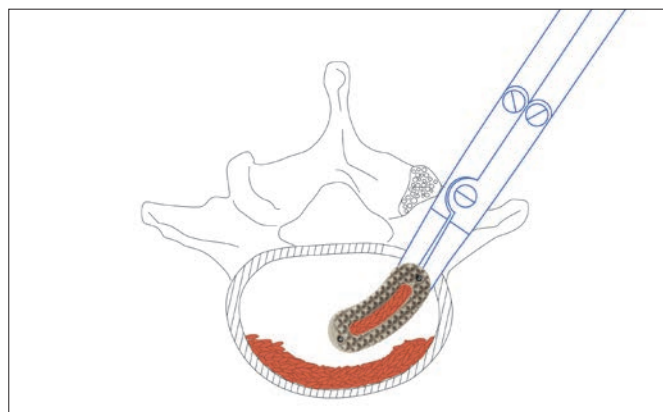
12. Position the TraviOS cage

Remove the implant holder and use the Impactor for TraviOS (389.274, 389.275) to nudge the cage into the correct position.

The optimal placement of the cage is in the anterior half of the intervertebral space.

Depending on the size of the vertebrae, the anterior rim of the cage will be 6–8 mm posterior to the anterior edges of adjacent vertebral bodies.

Use image intensification to verify the AP position of the cage relative to the vertebral bodies (see planning template).



13. Fill the posterior space

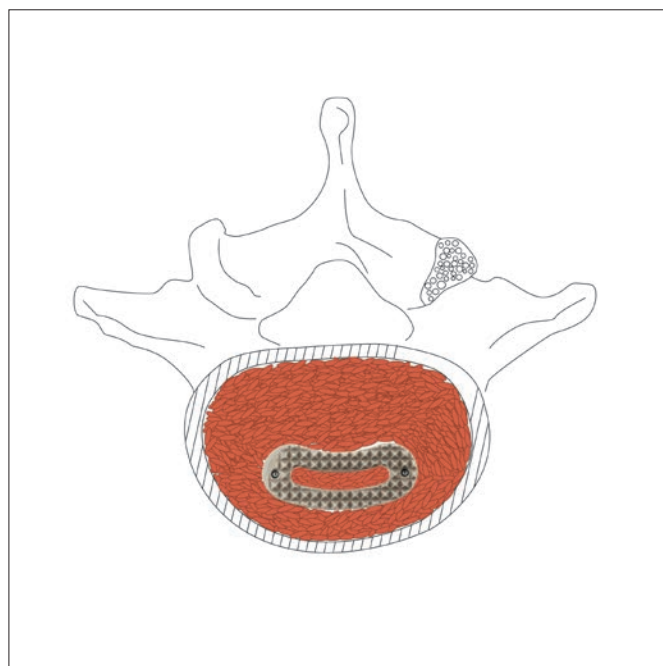
Use the cancellous bone graft funnel to fill the posterior disc space with additional bone graft material or bone graft substitute.



14. Remove instruments

Remove the funnel.

Carefully loosen and remove the distraction instrument.

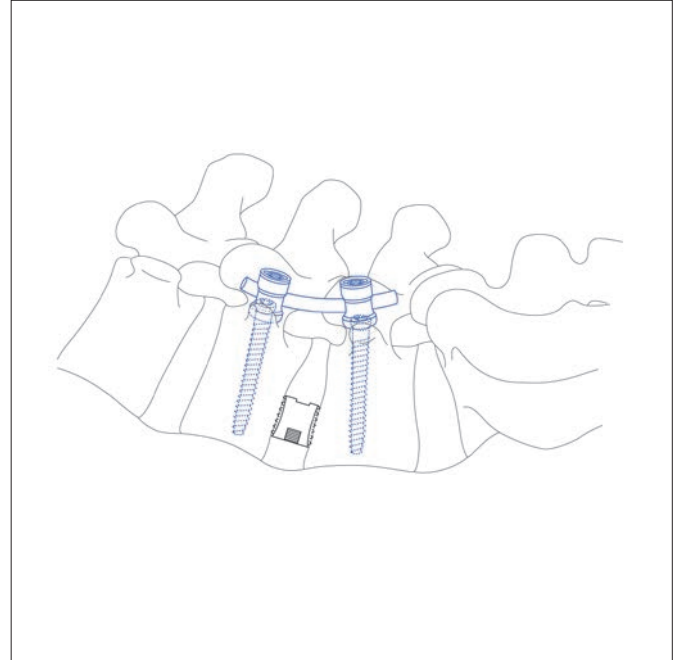


Posterior Fixation, Postoperative Management

Posterior fixation

Additional posterior fixation with transpedicular screws (Click'X, VAS or USS) considerably enhances the biomechanical stability of the motion segment as well as the stability of the TraviOS cage, and is therefore recommended.

The final steps of the fixation procedure (e.g. rod insertion, tightening, compression) are completed after implantation of the cage.



Postoperative management

The patient must be warned against activities that place excessive strain on the operated spinal area.

Physical activities and trauma with adverse effects on the affected vertebrae could lead to loosening of the implant, endplate fracture and failure of the surgical measure.

Instruments

388.414 Distractor, adjustable, with long feet, length 320 mm, for preassembled Pedicle Screws



389.265 Lamina Spreader for Travios



389.274 Impactor for Travios, straight



389.275 Impactor for Travios, curved













389.276 Osteotome, straight, 8 mm



389.277 Osteotome, straight, 12 mm



389.278	Bone Curette, straight, 7.5 mm	
389.279	Bone Curette, angled, 7.5 mm	
389.281	Bone Curette, right angled, 7.5 mm	
389.282	Bone Curette, left angled, 7.5 mm	
389.283	Bone Curette, rectangular, right, 8 mm	
389.284	Bone Curette, rectangular, left, 8 mm	
389.285	Bone Rasp, right, 8 mm	
389.286	Bone Rasp, left, 8 mm	
389.288	Cancellous Bone Impactor for TraviOS and Plivios, 8 x 2.5 mm	
394.562	Funnel for Cancellous Bone Graft Ø 8.0 mm, length 220 mm	

394.572 Cancellous Bone Impactor \varnothing 8.0 mm,
for No. 394.562



394.579 Cancellous Bone Impactor



394.951 T-Handle with Quick Coupling



03.806.000 Implant Holder, wide, for TraviOS



03.804.001 Packing Block for TraviOS, for 6 sizes



Bibliography

Aebi M, Thalgott JS, Webb JK (1998): AO ASIF Principles in Spine Surgery. Berlin: Springer.

Aebi M, Arlet V, Webb JK, (2007): AOSPINE Manual (2 vols), Stuttgart, New York: Thieme.

