B BRAUN
SHARING EXPERTISE

SPINE SURGERY

AESCULAP® TSPACE® TITANIUM

TRANSFORAMINAL LUMBAR INTERBODY FUSION SYSTEM

SURGICAL MANUAL

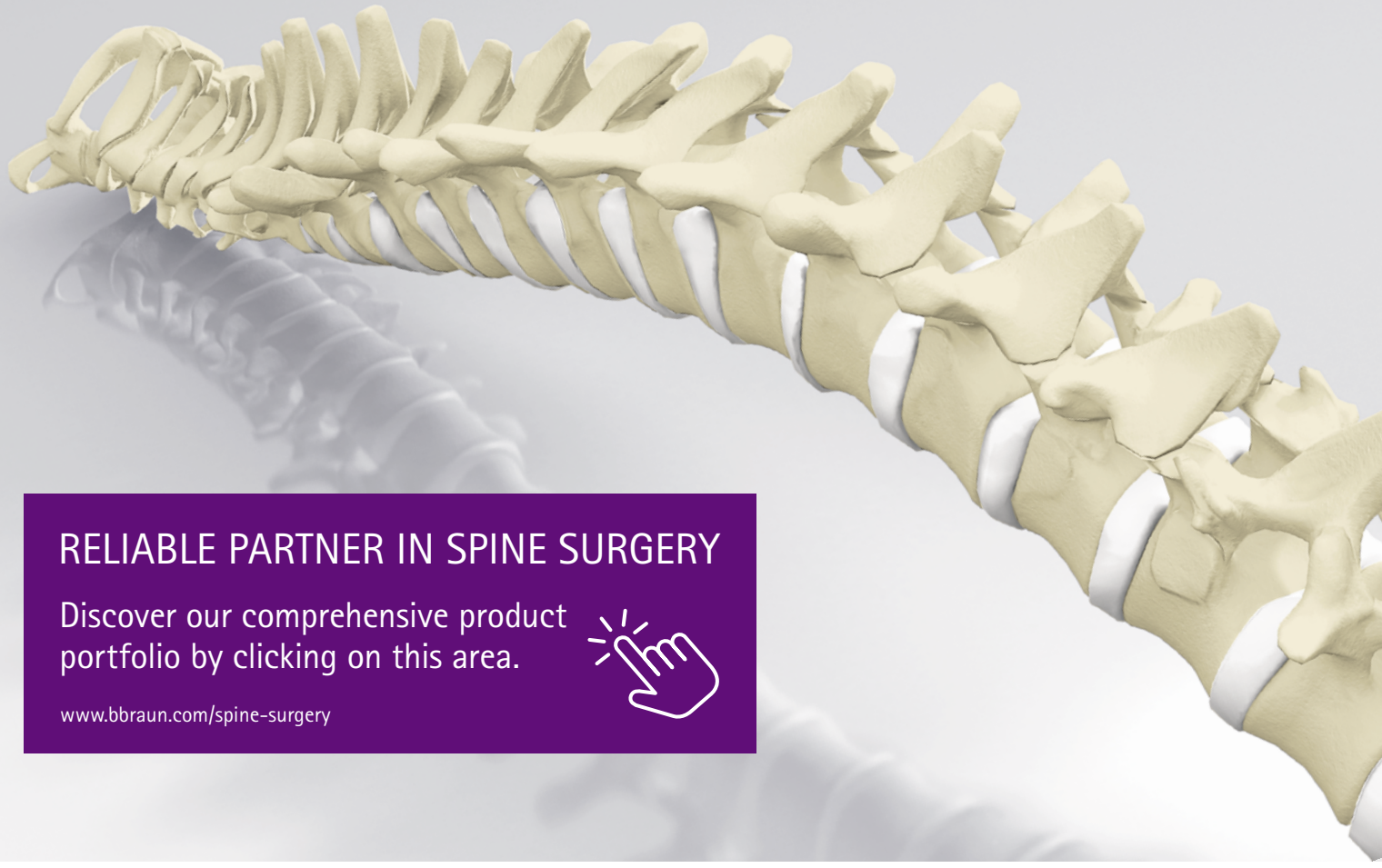
AESCULAP® THORACOLUMBAR SPINE

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 spine surgery is dedicated to protecting the spinal column and preserving its stability. We support spine surgeons with durable, reliable products and partner services for reliable 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.



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AESCULAP® TSPACE® TITANIUM

CONTENT

AESCULAP® TSPACE® TITANIUM

PHILOSOPHY

TSPACE® TITANIUM implants are used for stabilization of the lumbar and thoracic spine through transforaminal approach, monosegmental and multisegmental.

Always use TSPACE® TITANIUM implants in conjunction with an internal fixator.

It is indicated for the treatment of thoracolumbar instabilities.

TSPACE® TITANIUM IS DESIGNED TO DELIVER

- PRIMARY STABILITY (11).
- RESTORATION OF THE NATURAL DISC HEIGHT AND LORDOSIS.

IMPLANT MATERIAL

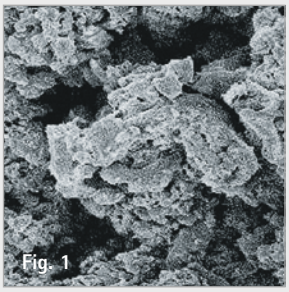


Fig. 1

The heart of this implant is a solid titanium alloy core (Ti6Al4V acc. to ISO 5832-3). The core is mantled with the proven PLASMAPORE® coating to increase the contact area between implant and endplate. PLASMAPORE® is a pure titanium coating (Ti/ISO 5832-2) which allows ingrowth of bone due to its balanced relationship between pore depth, porosity and roughness (2, 4, 8, 10).

Using a special manufacturing procedure, the implant surface is sprayed with pure titanium powder. Molten titanium particles settle on the core of the implant where they cool rapidly, building a firm form-lock between coating and core (Fig. 1).

In this way, each layer of the coating is built up and a favorable surface for bone ingrowth is created (2, 4, 8, 10) (Fig. 1).

AIM OF THE PLASMAPORE® COATING

- **Primary Stability**
  The increased surface roughness of the PLASMAPORE® coating contributes to the primary stability of the motion segment (2).
- **Secondary Stability**
  Bone growth into the coating is enabled due to the supportive features of PLASMAPORE®, which leads to bone fusion between the adjacent vertebras with the implant (2, 4, 8, 10).

The coating concept, which has been proven as a result of many years of use in the field of hip prosthetics, is widely used in spinal surgery (2, 9, 12, 13).

IMPLANT FEATURES

Fig. 2

Fig. 3

Fig. 4

Fig. 5

PLASMAPORE® COATING

- High primary stability due to roughened surface which increases migration resistance and mechanical strength (2).
- High secondary stability due to bone ongrowth and ingrowth into the PLASMAPORE® structure (2, 4, 8, 10).

IMPLANT DESIGN

- Anatomical shape for a precise implant fit.
- Lordotic implant design.
- Serrated profile for a high primary stability (11).
- Load sharing on a large contact area.

IMPLANT VARIETY

- Adequate range of sizes to enable the choice of implant size to fit the patient.

INSTRUMENT DESIGN

- Specifically designed and clearly arranged instruments.
- Straight and curved interbody inserter available.
- Inserters attach to implant via screw thread connection.

AESCULAP® TSPACE® TITANIUM

B | SURGICAL MANUAL

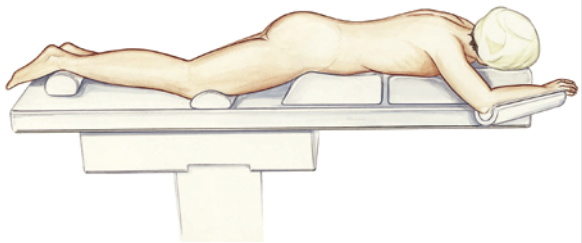


Fig. 1

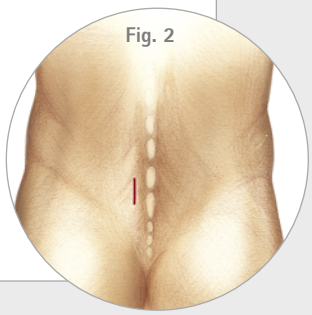


Fig. 2

B.1. POSITIONING OF THE PATIENT AND INCISION MARKING

- A minimally invasive approach requires the patient to be placed on a radiolucent table which allows for AP views of the various anatomic structures (Fig. 1).
- The appropriate position of the longitudinal incision (4 - 5 cm in length) is determined by using a C-arm. The intended skin incision is marked paraspinally on the right and respectively on the left side (Fig. 2).

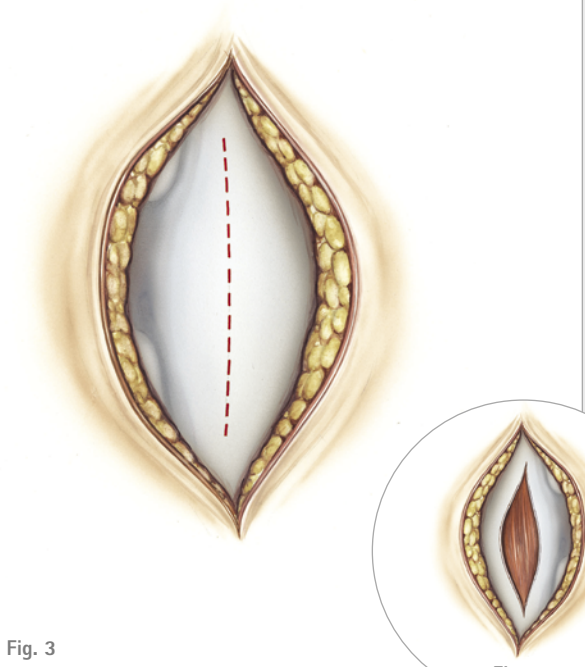


Fig. 3

Fig. 4

B.2. FASCIAL INCISION

- A slightly curved fascial incision 1.5 cm from the mid-line is performed. This allows a firm hold of the speculum and counter retractor, facilitating the exposure of the individual segment (Fig. 3 / 4).

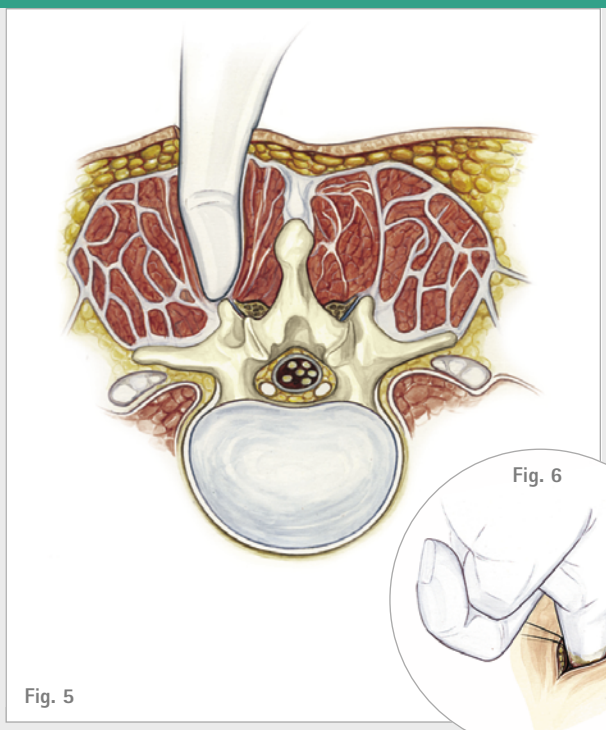


Fig. 5

Fig. 6

B.3. EXPOSURE AND BLUNT DISSECTION OF THE PARASPINAL MUSCLES

- After splitting of the thoracolumbar fascia a blunt dissection of the paraspinal muscles is performed with the fingertip. In accordance with the palpatory finding, a correction of the skin incision is still possible, as the muscle retractor should be introduced as vertically as possible and in the direction of the interlaminar space. The length of the retractor is selected by using the index finger (Fig. 5/6).

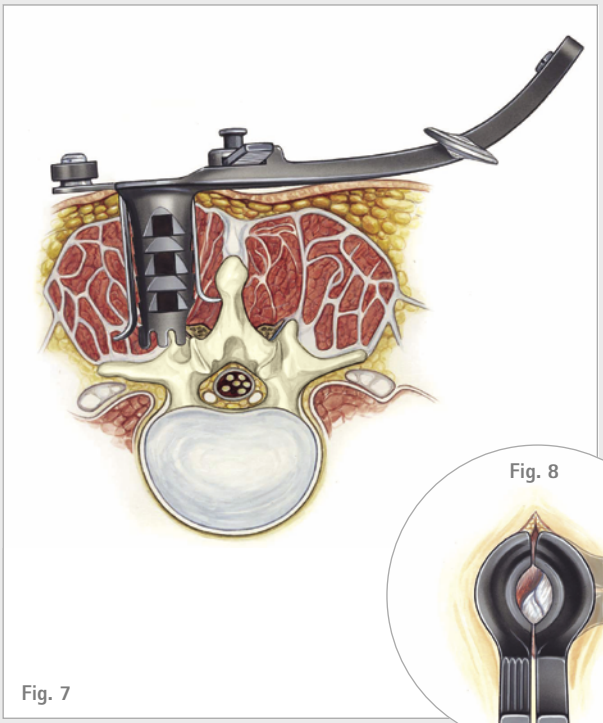


Fig. 7

Fig. 8

B.4. INTRODUCTION OF THE SPINE CLASSICS RETRACTOR SYSTEM

- Spine Classics retractor system: see brochure O11402

- The muscle retractor is introduced with closed blades and with the handle in the longitudinal direction. It is then turned 90° and expanded (Fig. 7/8).

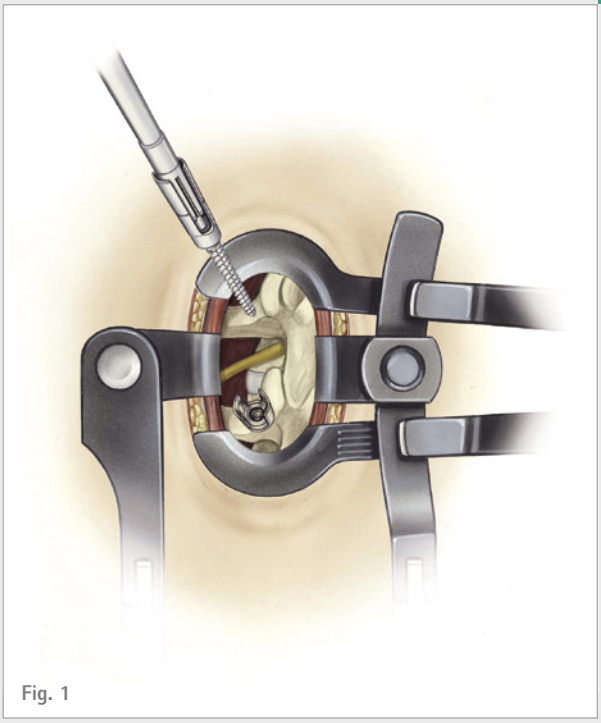


Fig. 1

B.5. INSERTION OF PEDICLE SCREW

- Using the standard technique, the pedicle screws are inserted, e. g. AESCULAP® Ennovate® (Fig. 1).

For more information please visit www.bbraun.com/ennovate

INFORMATION
Thoracolumbar pedicle screw system shown in images is the AESCULAP® S4® Spinal System.

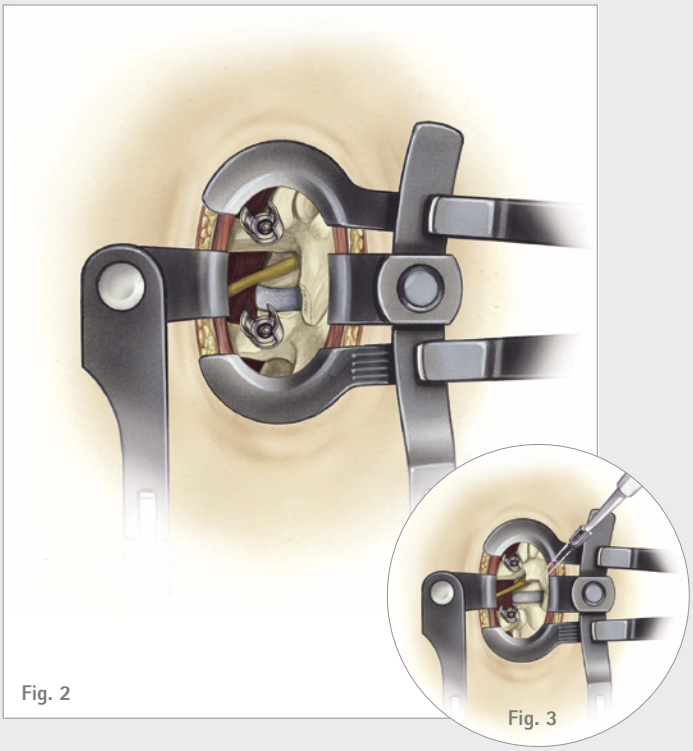


Fig. 2

Fig. 3

B.6. REMOVAL OF FACET JOINT

- A complete unilateral facetectomy should be considered on the side targeted for the implant insertion, for which an osteotome may be used. The inferior articular process of the facet joint is resected first, then the subjacent superior articular process is resected (Fig 2 / 3).

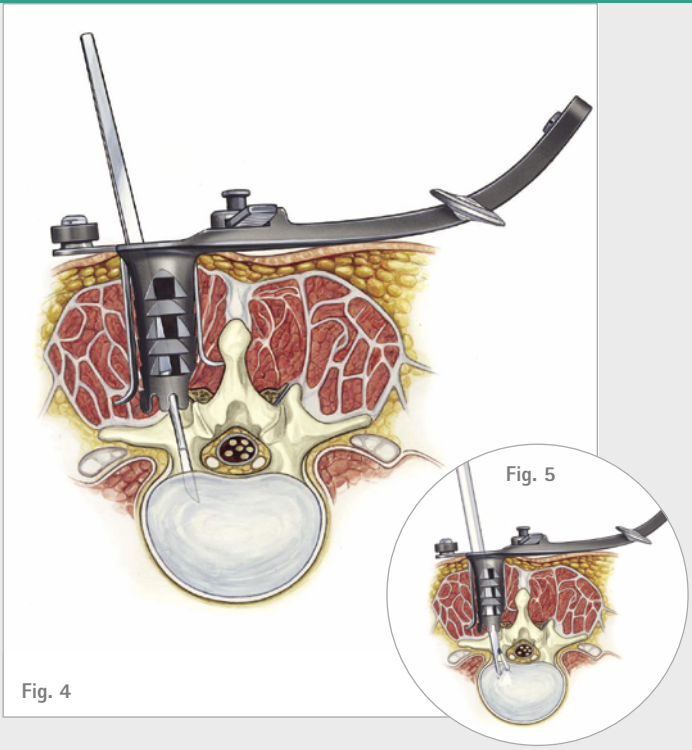


Fig. 4

Fig. 5

B.7. OPENING OF THE DISC AND REMOVAL OF DISC MATERIAL

- To open the disc a small window is cut into the annulus (Fig. 4).
- Rongeurs are used to remove the opened annulus (Fig. 5).
- Posterior osteophytes are removed by using Kerrisons.

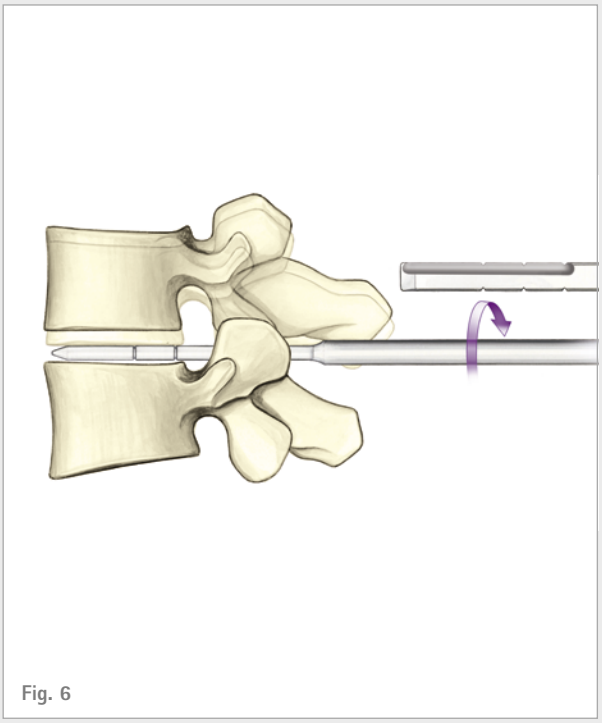


Fig. 6

B.8. RESTORATION OF DISC HEIGHT

- The desired restoration of the natural disc height can be set using the distractors. They are available in heights from 7 - 17 mm in 2 mm increments and can be attached to the t-handle in the set.
- The distractor must be inserted horizontally and then rotated. Rotating clockwise the distractors are blunt and allow for a blunt height restoration maneuver. Rotating counterclockwise the distractors have a specially designed sharp rim to allow for removal of disc material (Fig. 6).

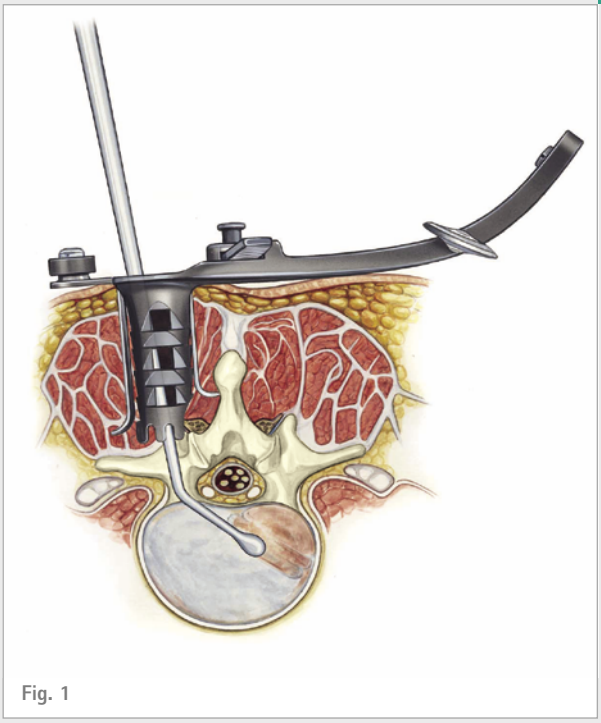


Fig. 1

B.9. CLEANING OF THE INTERVERTEBRAL SPACE

- The disc space is cleared using rongeurs, bone curettes and box curettes (Fig. 1).
- The bone rasps are used for endplate preparation.
- Alternatively, the box curettes can be used.

INFORMATION

Make certain that the endplates of the neighboring vertebral bodies are not weakened, in order to minimize the risk of migration.

Make certain that the implant bed is properly prepared to avoid damage to the implant when it is driven in.

Use the nerve root retractors to protect the dura during insertion.

Fig. 2

B.10. DETERMINATION OF IMPLANT SIZE USING TRIAL IMPLANTS

- The TSPACE® TITANIUM trial implants are available in heights from 7 - 17 mm in 2 mm increments.
- Using the slap hammer the desired trial implant is inserted (Fig. 2).

INFORMATION

The trials are essential to ensure the correct implant size to be used.

Fig. 3

Fig. 4

B.11. IMPLANT INSERTION

- It is recommended to place bone material harvested from the facet joint around the TSPACE® TITANIUM implant.
- The insertion guide supports the implantation of the TSPACE® TITANIUM implant (Fig. 3).
- The TSPACE® TITANIUM implant is inserted gradually into the disc space using the straight or the curved implant inserter (Fig. 4).
- The TSPACE® TITANIUM inserters attach to implant via a screw thread connection.

Fig. 1

Fig. 2

B.12. FINAL IMPLANT POSITIONING

- Carefully pull the inserter out of the implant. Avoid tilting of the instrument.
- Using the straight or angled impactor the implant is rotated 90° to achieve the final positioning (Fig. 1).
- X-ray control verify the implant positioning.
- It is recommended to put bone material harvested from the facet joint around the TSPACE® TITANIUM implant (Fig. 2).

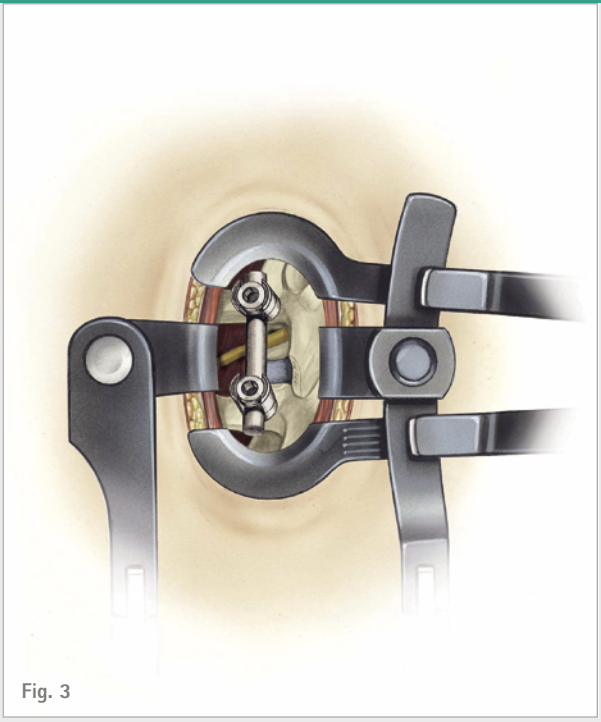


Fig. 3

B.13. APPLICATION OF ROD AND SET SCREW

- Final assembly of the thoracolumbar pedicle screw system (Fig. 3).
- Compression is applied to the pedicle screws to support the contact area between the TSPACE® TITANIUM implant and the endplates.
- Final tightening of the pedicle screws and closure.

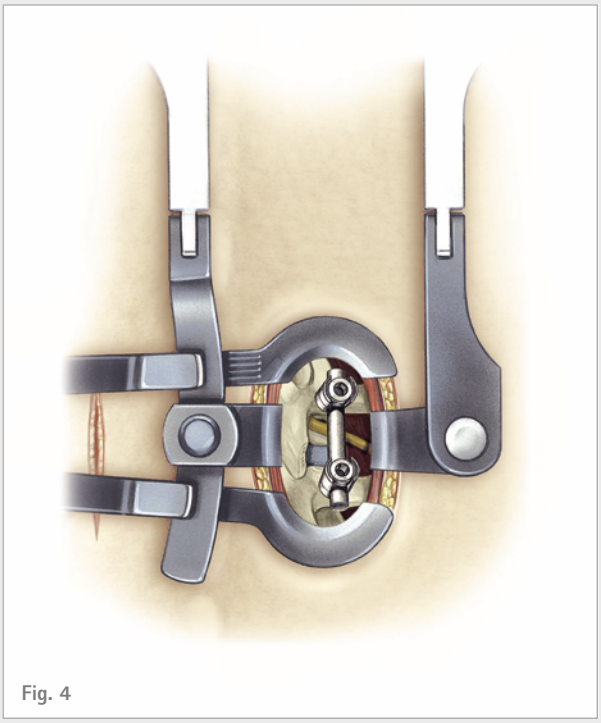


Fig. 4

B.14. PEDICLE SCREW POSITIONING ON THE CONTRA-LATERAL SIDE

- Thoracolumbar pedicle screw system is applied on the contra-lateral side (Fig. 4).

To view our full portfolio please visit www.bbraun.com

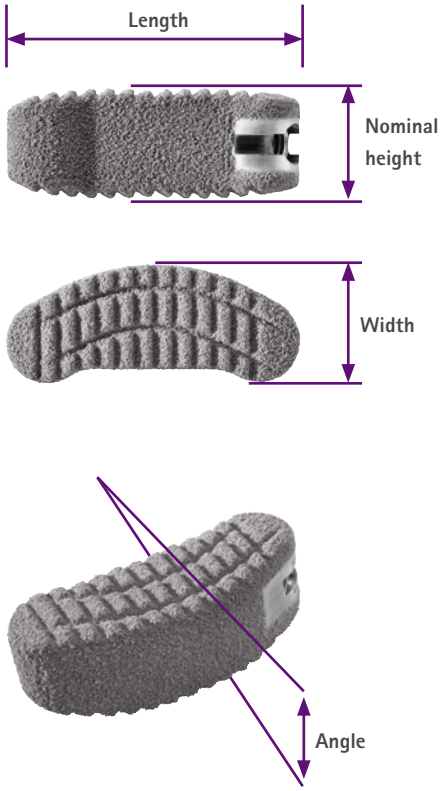
INFORMATION

Thoracolumbar pedicle screw system shown in images is the AESCULAP® S4® Spinal System.

AESCULAP® TSPACE® TITANIUM

C | IMPLANT & INSTRUMENT OVERVIEW

TSPACE® TITANIUM IMPLANTS



Article No.	Size (Length x Width x Height)	Angle
SJ327T	26 x 12 x 7 mm	5°
SJ328T	26 x 12 x 8 mm	5°
SJ329T	26 x 12 x 9 mm	5°
SJ330T	26 x 12 x 10 mm	5°
SJ331T	26 x 12 x 11 mm	5°
SJ332T	26 x 12 x 12 mm	5°
SJ333T	26 x 12 x 13 mm	5°
SJ335T	26 x 12 x 15 mm	5°
SJ337T	26 x 12 x 17 mm	5°
SJ349T	26 x 12 x 9 mm	8°
SJ351T	26 x 12 x 11 mm	8°
SJ353T	26 x 12 x 13 mm	8°
SJ355T	26 x 12 x 15 mm	8°
SJ357T	26 x 12 x 17 mm	8°
SJ367T	30 x 12 x 7 mm	5°
SJ368T	30 x 12 x 8 mm	5°
SJ369T	30 x 12 x 9 mm	5°
SJ370T	30 x 12 x 10 mm	5°
SJ371T	30 x 12 x 11 mm	5°
SJ372T	30 x 12 x 12 mm	5°
SJ373T	30 x 12 x 13 mm	5°
SJ375T	30 x 12 x 15 mm	5°
SJ377T	30 x 12 x 17 mm	5°
SJ389T	30 x 12 x 9 mm	8°
SJ391T	30 x 12 x 11 mm	8°
SJ393T	30 x 12 x 13 mm	8°
SJ395T	30 x 12 x 15 mm	8°
SJ397T	30 x 12 x 17 mm	8°

All TSPACE® TITANIUM implants are single sterile packed.

FJ630 – TSPACE® TITANIUM INSTRUMENTATION

FJ633R
TSPACE® TITANIUM – Preparation Tray

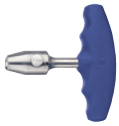
INSTRUMENTS	Article No.	Description	Quantity
	FJ679R	Left angled bone curette, 45°	1*
	FJ680R	Right angled bone curette, 45°	1*
	FJ698R	Left angled bone curette, 20°	1
	FJ699R	Right angled bone curette, 20°	1
	FJ681R	Curette, straight	1
	FJ682R	Left angled curette, 45°	1*
	FJ683R	Right angled curette, 45°	1*
	FJ702R	Left angled curette, 20°	1
	FJ703R	Right angled curette, 20°	1
	FJ658R	Straight osteotome, 8 mm	1
	FJ685R	Left angled bone rasp, 45°	1*
	FJ686R	Right angled bone rasp, 45°	1*
	FJ704R	Left angled bone rasp, 20°	1
	FJ705R	Right angled bone rasp, 20°	1
	FJ633R	Tray for preparation instruments	1
	JH217R	Wide Perf. basket lid	1

*This article is optional.
Recommended container for tray FJ633R: JK441 (without perforation) / JN441 (with perforation). Recommended lid: JK489.

AESCULAP® TSPACE® TITANIUM

C | IMPLANT & INSTRUMENT OVERVIEW

FJ630 – TSPACE® TITANIUM INSTRUMENTATION

INSTRUMENTS	Article No.	Description	Quantity
	FJ646R	T-Handle for distractors	1
	FJ647R	Distractor, 7 mm	1
	FJ649R	Distractor, 9 mm	1
	FJ651R	Distractor, 11 mm	1
	FJ653R	Distractor, 13 mm	1
	FJ655R	Distractor, 15 mm	1*
	FJ657R	Distractor, 17 mm	1*
	FJ666R	Slap hammer for trials	1
	FJ667R	TSPACE® trial, 7 mm	1*
	FJ669R	TSPACE® trial, 9 mm	1*
	FJ671R	TSPACE® trial, 11 mm	1*
	FJ673R	TSPACE® trial, 13 mm	1*
	FJ675R	TSPACE® trial, 15 mm	1*
	FJ677R	TSPACE® trial, 17 mm	1*
	FJ619R	TSPACE® curved trial, 7 mm	1
	FJ621R	TSPACE® curved trial, 9 mm	1
	FJ623R	TSPACE® curved trial, 11 mm	1
	FJ625R	TSPACE® curved trial, 13 mm	1
	FJ627R	TSPACE® curved trial, 15 mm	1*
	FJ629R	TSPACE® curved trial, 17 mm	1*

*This article is optional.
Recommended container for FJ641P: JK442/JN442 and lid JK489.

INSTRUMENTS	Article No.	Description	Quantity
	FJ051R	Retractor S	1
	FJ052R	Retractor M	1
	FJ053R	Retractor L	1
	FJ054R	Retractor XL	1
	FJ700R	TSPACE® TITANIUM straight insertion instrument	1
	FJ701R	TSPACE® TITANIUM curved insertion instrument	1
	FJ661R	TSPACE® insertion guide	1*
	FJ662R	TSPACE® impactor, straight	1
	FJ663R	TSPACE® impactor, angled	1
	FJ635R	Tray for implantation instr.	1
	JH217R	Wide Perf. basket lid	1

PLEASE NOTE
Either the straight or the curved trials and inserter fit into the tray.

*This article is optional.
Recommended container for FJ642P: JK441 / JN441 and lid JK489.

AESCULAP® TSPACE® TITANIUM

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