Aesculap® T-Space® PEEK

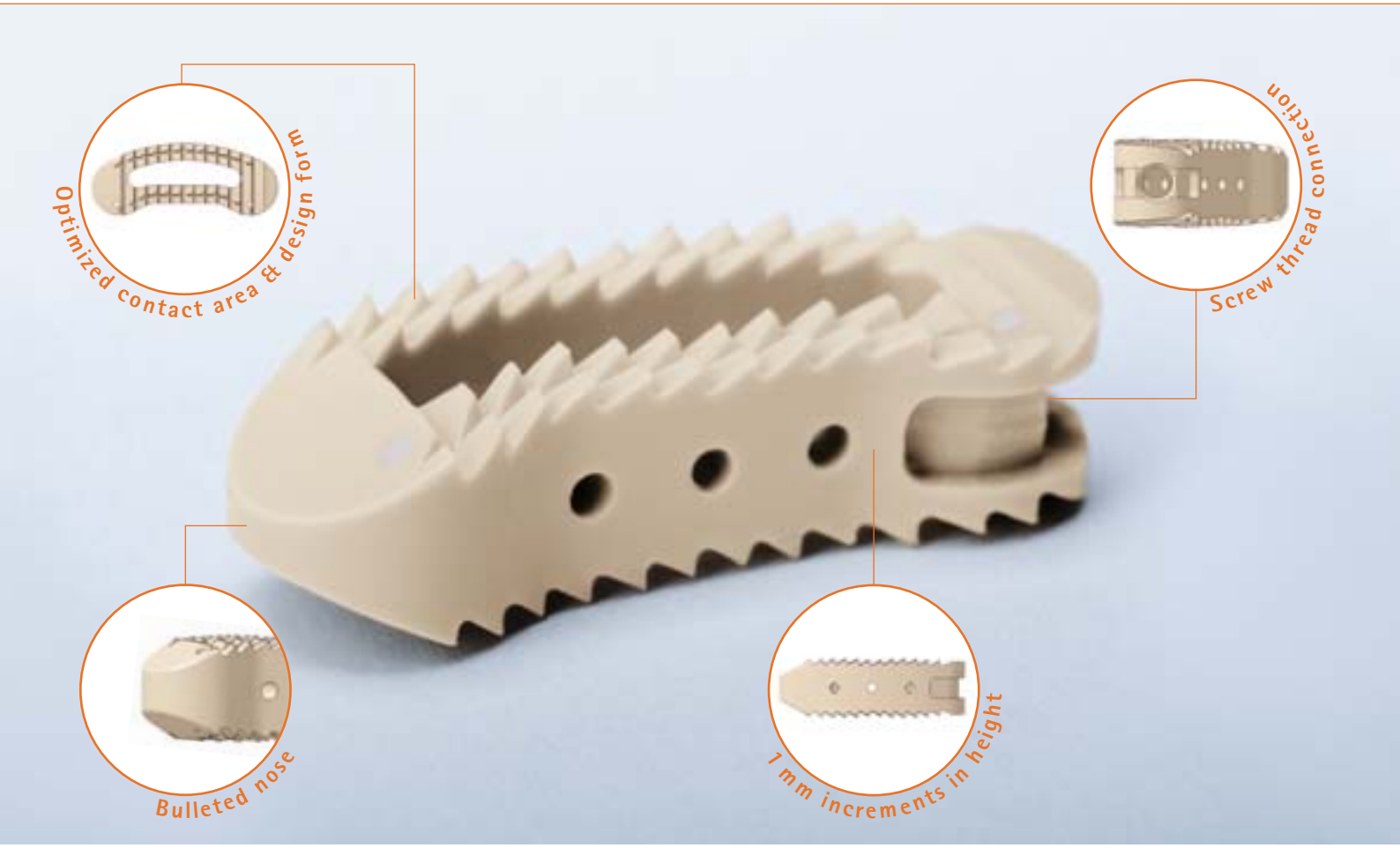
Transforaminal Lumbar Interbody Fusion System

Aesculap Spine

New Generation
T-Space PEEK Cages

B BRAUN
SHARING EXPERTISE

Aesculap® T-Space® PEEK



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Foreword

A

The high incidence of spinal disorders and consecutive symptoms calls for optimized diagnostics and therapies. Minimally invasive surgical procedures, being generally cost-efficient, significantly less invasive with fewer complications, and producing better outcomes, are of particular interest. Minimally invasive spine surgery relies on various retractor systems to create small ventral and dorsal access channels to the spine. At the same time innovative implants reducing tissue trauma and new percutaneous surgical techniques are coming up. Accordingly, the innovative S^4 Spinal System, the Spine Classics retractor system and the T-Space cage for intercorporal fusion form an excellent treatment concept.
In this way, minimally invasive mono- and bisegmental fusion surgeries at the lumbar spine can be successfully performed after a relatively short learning curve.

The new generation of T-Space PEEK cages is a further development of the 2006 launched and clinically proven Aesculap transforaminal interbody fusion system. The changes mainly regard the implant design – the new bulleted nose facilitates the implantation of the cage especially in very degenerated discs. Furthermore the connection of the implant with the inserter is improved by means of a screw thread. Besides, the system offers an extended size range presenting the right implant to fit the patient. The instrumentation stays reduced, clearly arranged and simple in handling. Moreover the surgeon can choose between three inserters as the preference or situation in-situ may be.

Spine Classics

S^4 Spinal System

Aesculap® T-Space® PEEK

B

Implant material T-Space PEEK

The material used is biocompatible PEEK-Optima®, which was introduced by Invibio in 1999. PEEK stands for PolyEtherEtherKetone. PEEK-Optima® polymer comply with ISO10993-1, USP Class VI and ASTM F2026 for use as a medical implant material.

The use of PEEK-Optima® as an orthopedic device material enjoys increased popularity in recent years due to the material's unique combination of characteristics. It's properties include radiolucency, high mechanical strength, biocompatibility and compatibility with standard sterilization methods.

The intrinsic radioscopic transparency of the material on X-rays and CT scans makes it possible to view bone growth adjacent to the implant. This allows quick and simple assessment of the bone structure and progress towards bone fusion. To verify the position of the PEEK implant on radioscopic images, non-radiolucent tantalum marker serve as location marker.

Of particular interest is the modulus of elasticity of PEEK-Optima® of 3.6 GPa, which is similar to that of cortical bone. This specific stiffness encourages load sharing between implant material and natural bone, thereby stimulating bone healing activity. The material provides excellent strength and rigidity. PEEK-Optima® also exhibits high fatigue resistance and low wear factor.

Extensive investigations into the biocompatibility of PEEK-Optima® have proven that the material is suitable for the use as a long-term implant.

Lateral view

AP view

Implant features T-Space PEEK

C

Position verification despite X-ray transparency

- PEEK-Optima® is radiolucent and allows therefore a quick and simple assessment of the bone structure and progress towards bone fusion
- Tantalum marker allow for easy and exact implant localization

Intelligent implant design

- Bulleted nose for easier implantation especially in very degenerated discs
- Screw thread connection for safe and easy connection with the inserter
- 1 mm increments in height
- Optimized ratio between contact area and opening

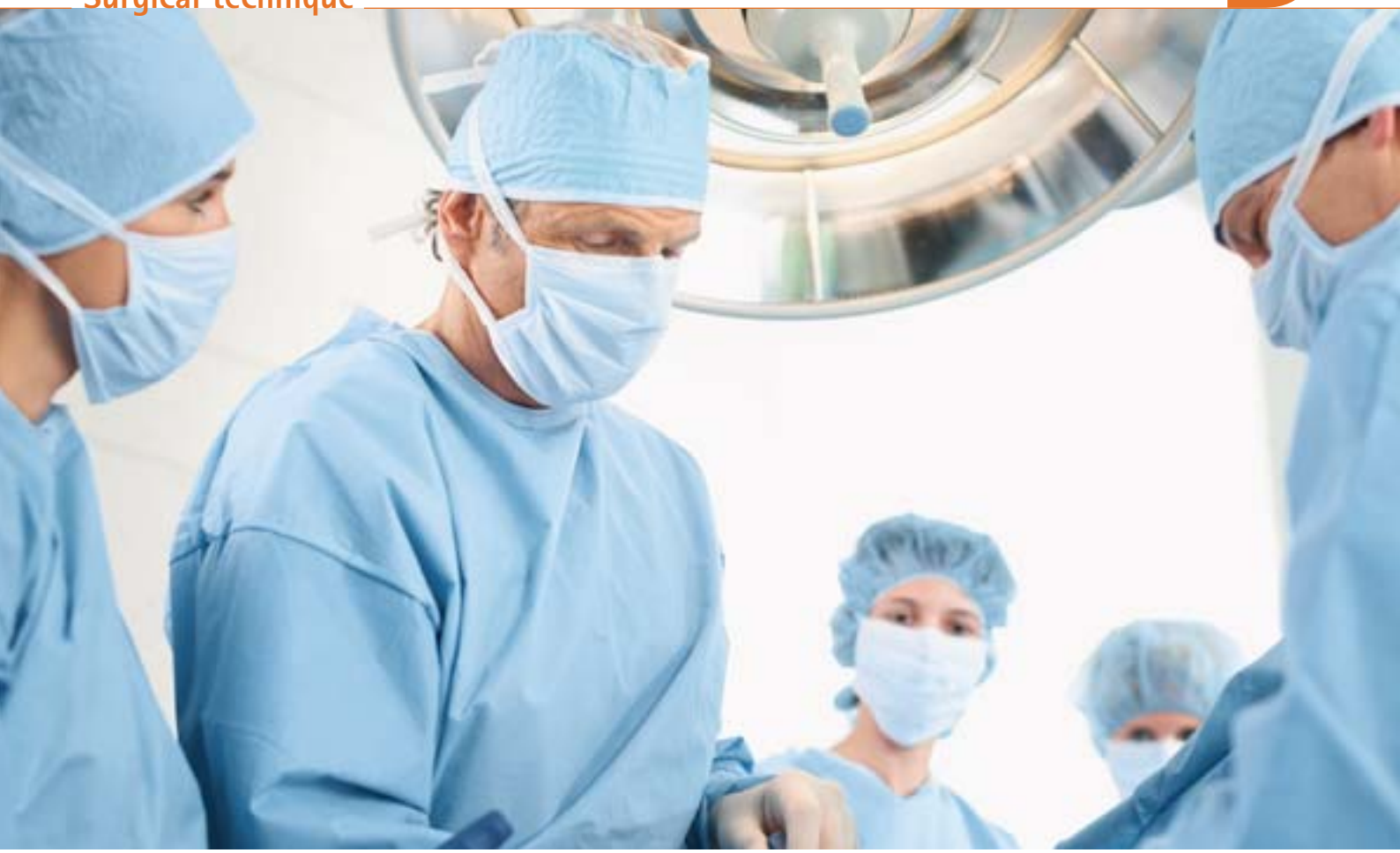
Thought-out instruments

- Straight or curved inserter as the preference or situation in-situ may be
- Offset inserter for comfortable use with microscope or C-arm

Aesculap® T-Space® PEEK

D

Surgical technique



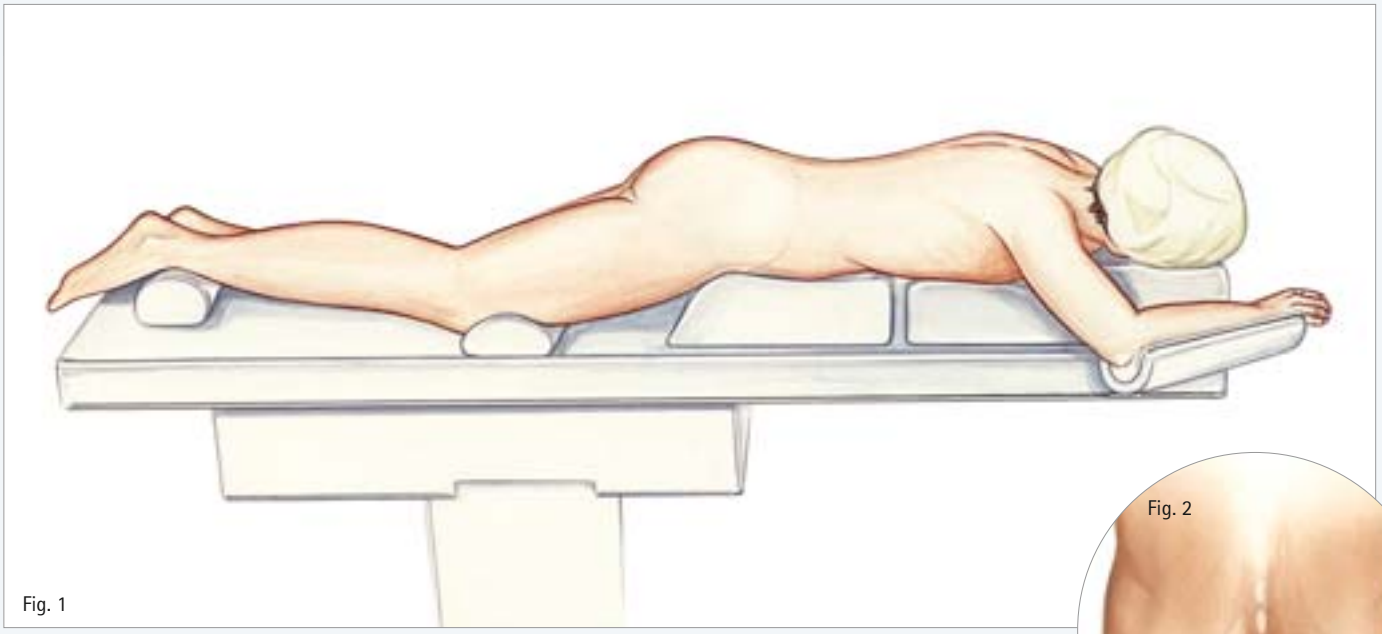


Fig. 1

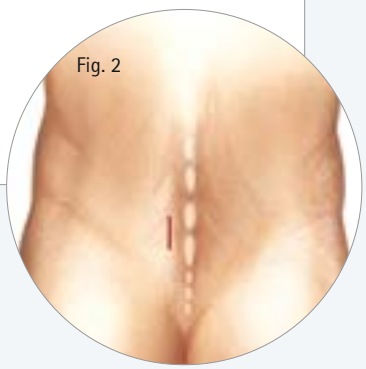


Fig. 2

Positioning of the patient and incision marking (Fig. 1–2)

- A minimally invasive approach requires the patient to be placed on a radiolucent table which allows for AP views of the various anatomic structures.
- 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 respectively on the left side.

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Surgical technique

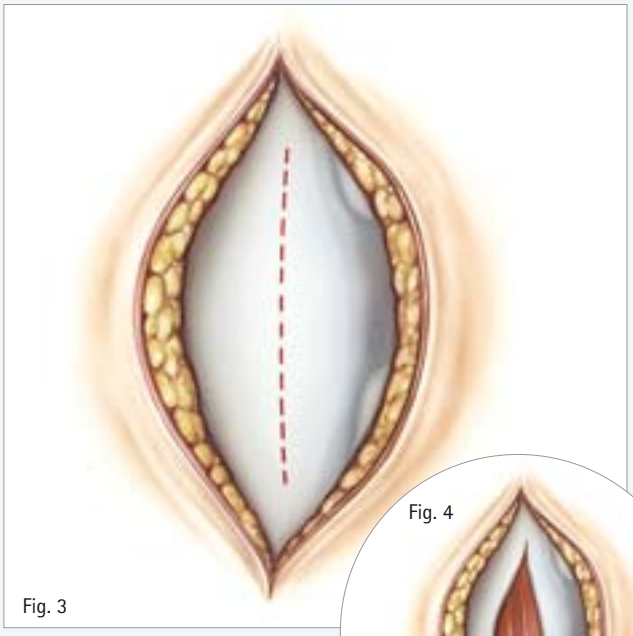

Fig. 3

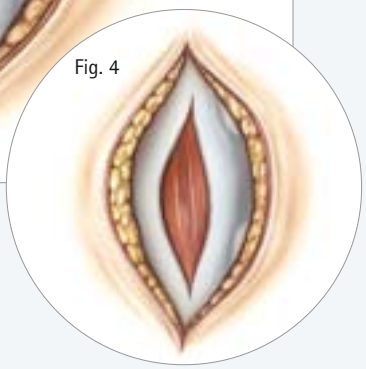

Fig. 4

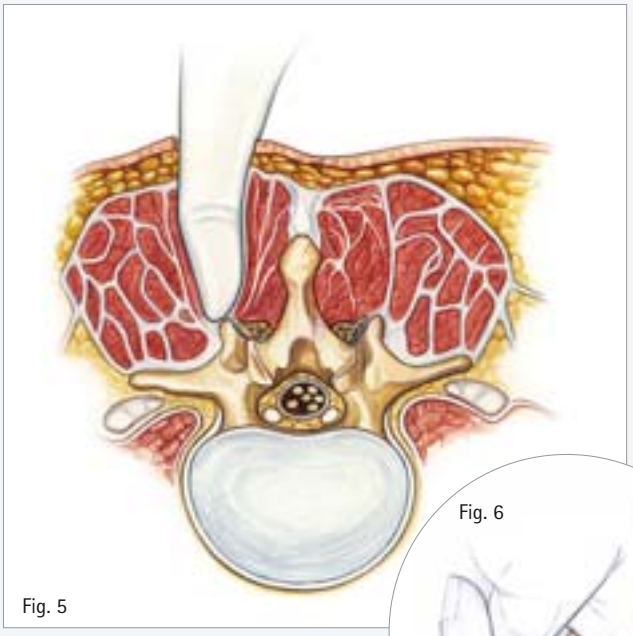

Fig. 5

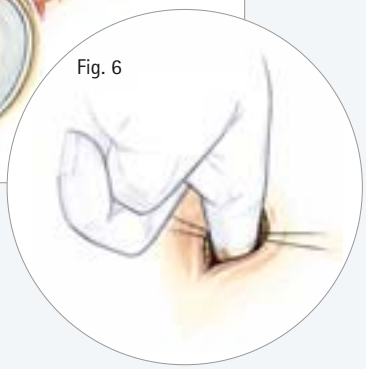

Fig. 6

Fascial incision
(Fig. 3-4)

- A slightly arcuate fascial incision 1.5 cm from the midline is performed. This allows a firm hold of the speculum and counter retractor, fascilitating the exposure of the individual segment.

Exposure and blunt dissection of the paraspinal muscles
(Fig. 5-6)

- 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. 7

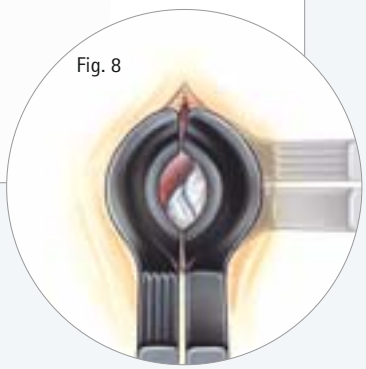

Fig. 8

- *Spine Classics retractor system*
- *See brochure 011402*

Introduction of the Spine Classics retractor system (Fig. 7–8)

- The muscle retractor is introduced with closed blades and with the handle in the longitudinal direction of the body. It is then turned 90° with the handle towards the assistant and afterwards expanded.

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Surgical technique

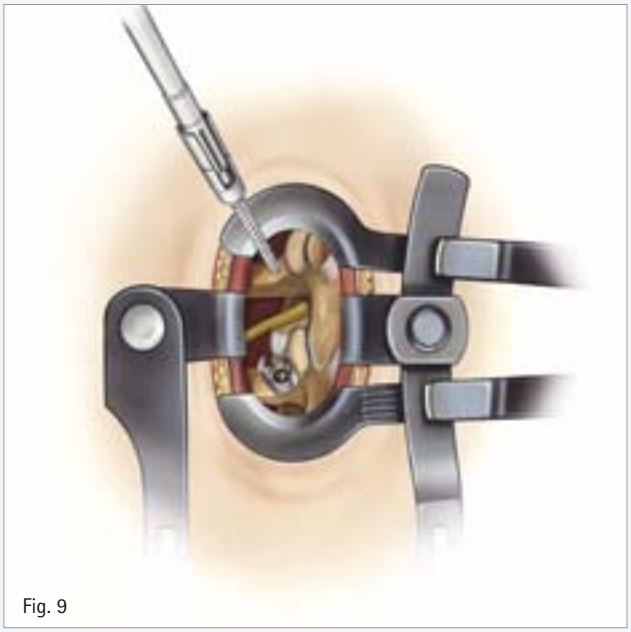

Fig. 9

- *S⁴ Spinal System*
- *See surgical technique 026702*

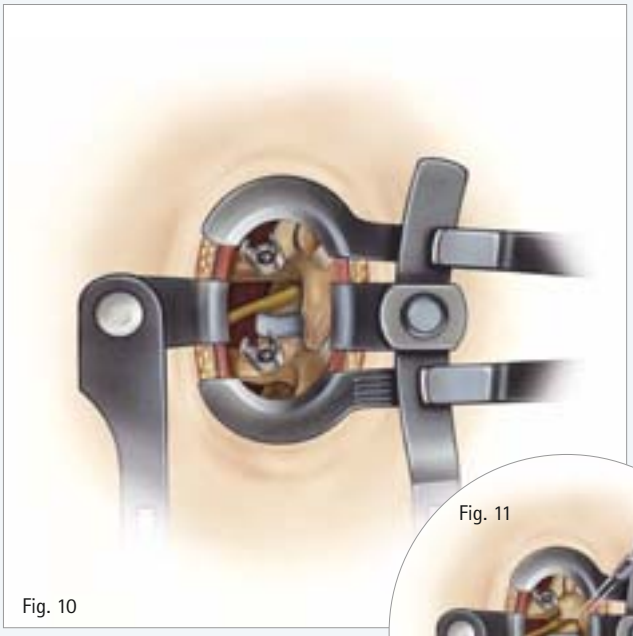

Fig. 10

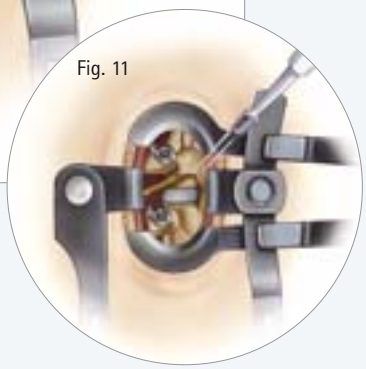

Fig. 11

- *Osteotome FJ658R*

Insertion of S⁴ screws
(Fig. 9)

- Using the standard technique the S⁴ Spinal System pedicle screws are inserted.

Removal of facet joint
(Fig. 10–11)

- A complete unilateral facetectomy should be considered on the side targeted for the implant insertion. The inferior articular process of the facet joint is resected first, then the subjacent superior articular process is resected.

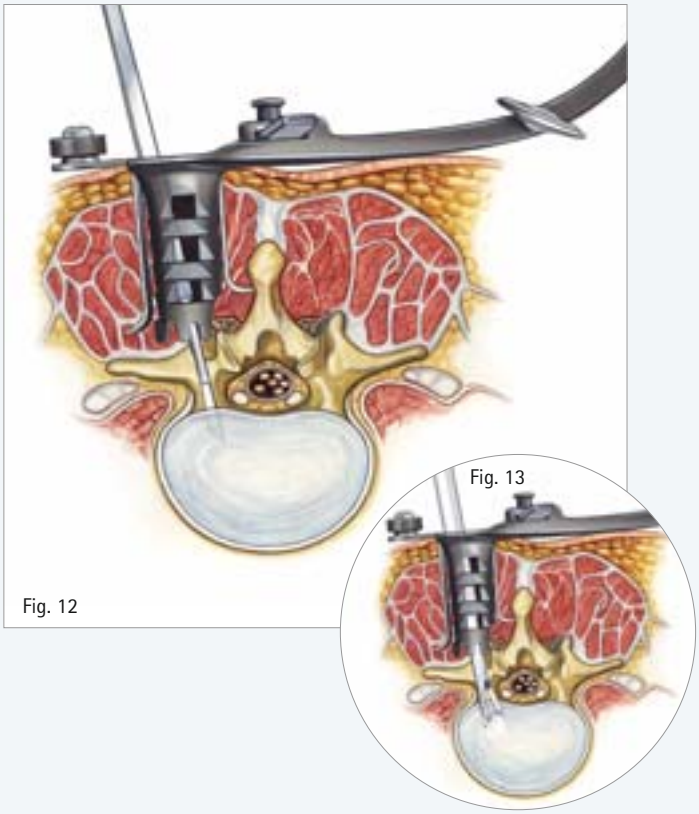

Fig. 12

Fig. 13

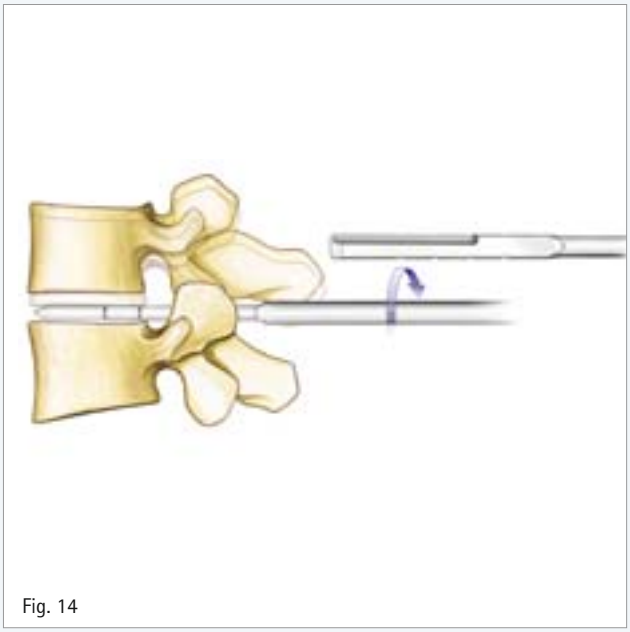

Fig. 14

- *T-handle SJ033R*
- *Distractors FJ647R-FJ657R*

Opening of the disc and removal of disc material (Fig. 12-13)

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

Restoration of disc height (Fig. 14)

- The desired restoration of the natural disc height can be set using the distractors. They are available in heights from 7-17 mm in 1 mm increments.
- The distractor must be inserted horizontally and then rotated. Rotating clockwise the distractors are blunt. A special designed sharp rim allows removal of disc material. If so, the distractor has to be rotated counterclockwise.

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Surgical technique

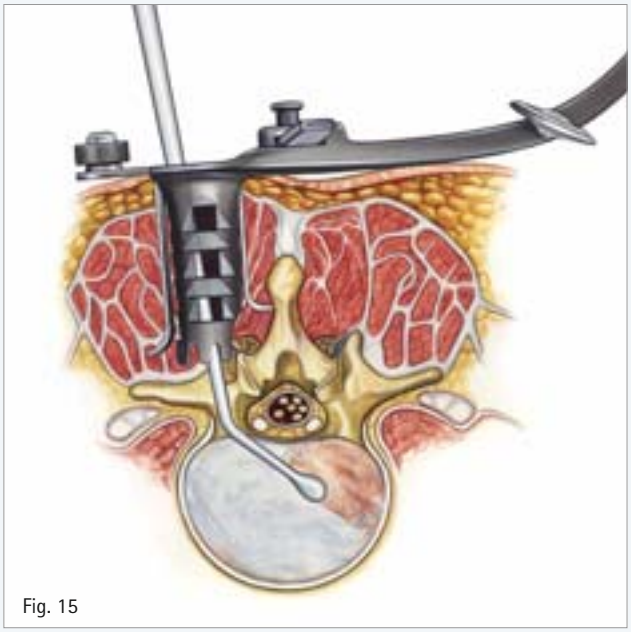

Fig. 15

- *Bone curettes, angled FJ679R-FJ680R or FJ698R-FJ699R*
- *Box curette, straight FJ681R*
- *Box curettes, angled FJ682R-FJ683R or FJ702R-FJ703R*
- *Bone rasps, angled FJ685R-FJ686R or FJ704R-FJ705R*

Cleaning of the intervertebral space (Fig. 15)

- The disc space is cleared using rongeurs, bone curettes and box curettes.
- The bone rasps are used to refresh the cartilaginous endplates. Alternatively the box curettes can be used.

Excessive preparation of the endplates may weaken the construct and cause subsidence of the interbody device.

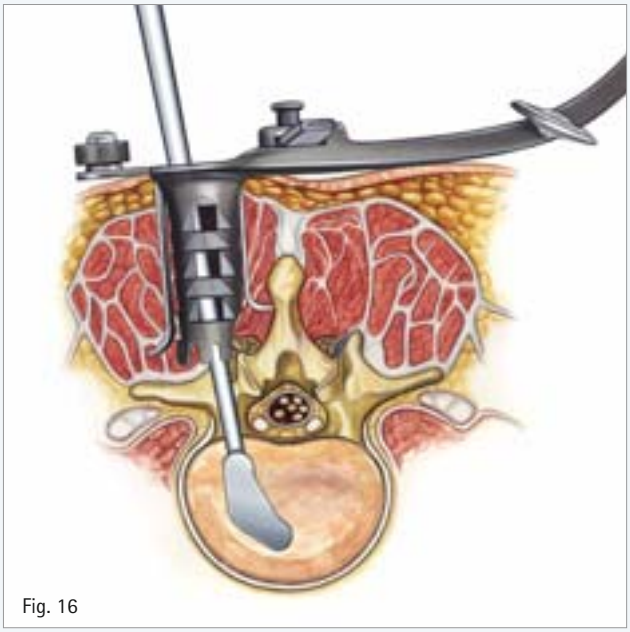

Fig. 16

- *T-handle SJ033R*
- *Trials FJ667R-FJ677R or FJ619R-FJ629R*

Determination of implant size using trial implants (Fig. 16)

- The trial implants are available in heights from 7-17 mm in 1 mm increments.
- Using the T-handle the desired trial implant is inserted.

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

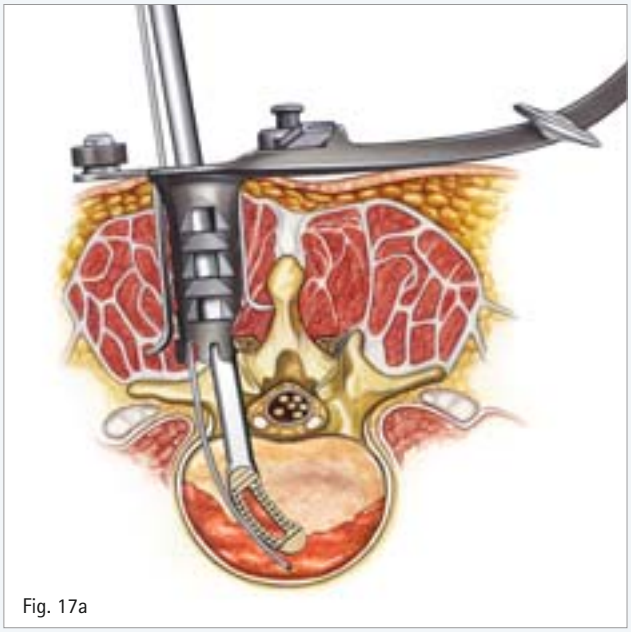

Fig. 17a

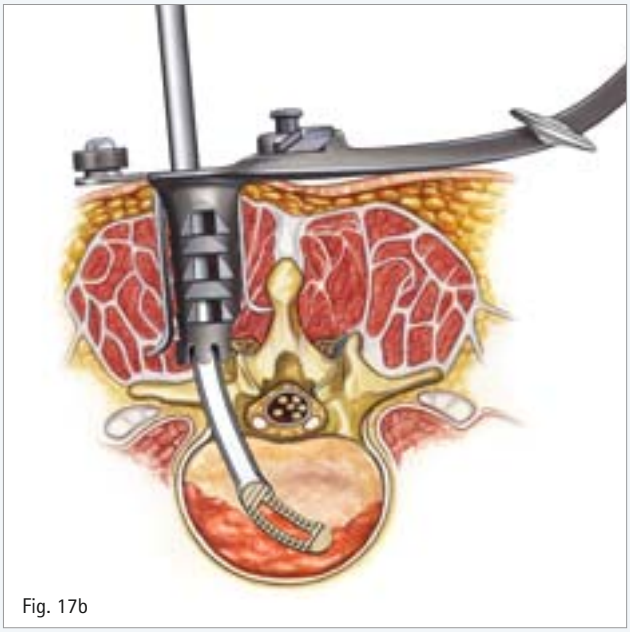

Fig. 17b

- *Packing block FJ615R*
- *Inserter FJ604R/FJ605R/FJ603R*

Implant insertion
(Fig. 17a–b)

- The T-Space PEEK implant should be filled with bone or bone substitute by using the packing block.
- It is recommended to place bone graft in the anterior part.
- Partially the T-Space PEEK implant is inserted into the disc space. Three inserter options are available: a straight and a curved one as well as an offset inserter. The implant is connected with the inserter by means of a screw thread.

FJ604R FJ605R FJ603R

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Surgical technique

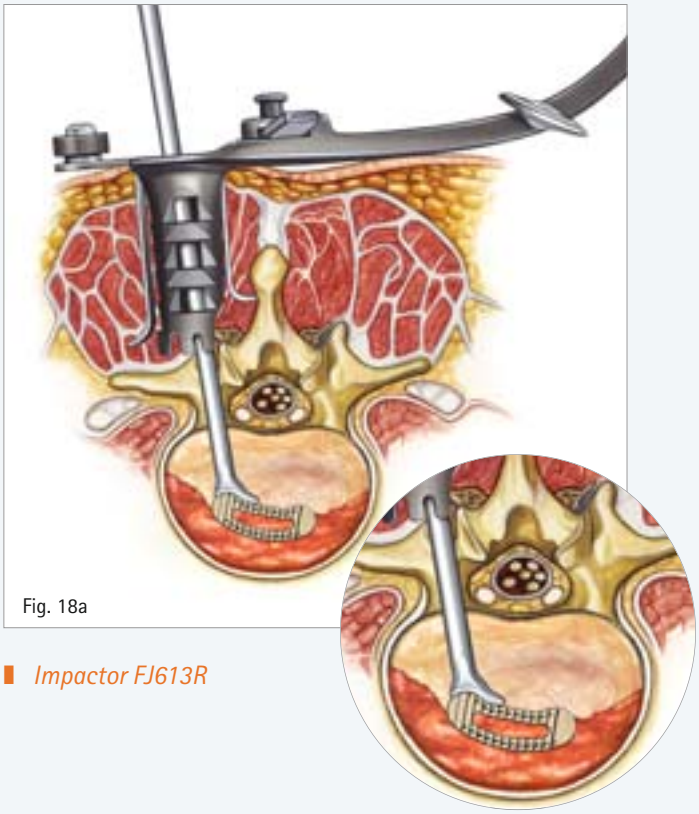


Fig. 18a

Fig. 18b

Fig. 19

- *Impactor FJ613R*

Final implant positioning
(Fig. 18a–b and Fig. 19)

- Using the impactor the implant is rotated 90° to achieve the final positioning.
- X-ray control to verify the implant positioning.
- It is recommended to put bone material harvested from the facet joint around the T-Space implant.

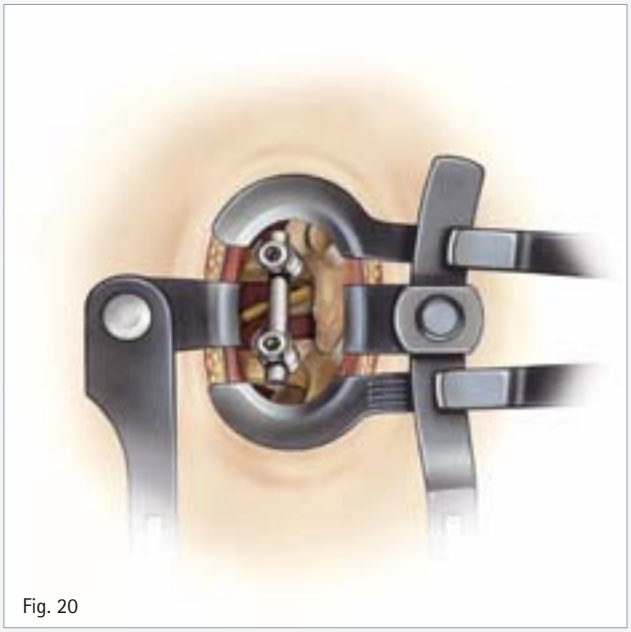


Fig. 20

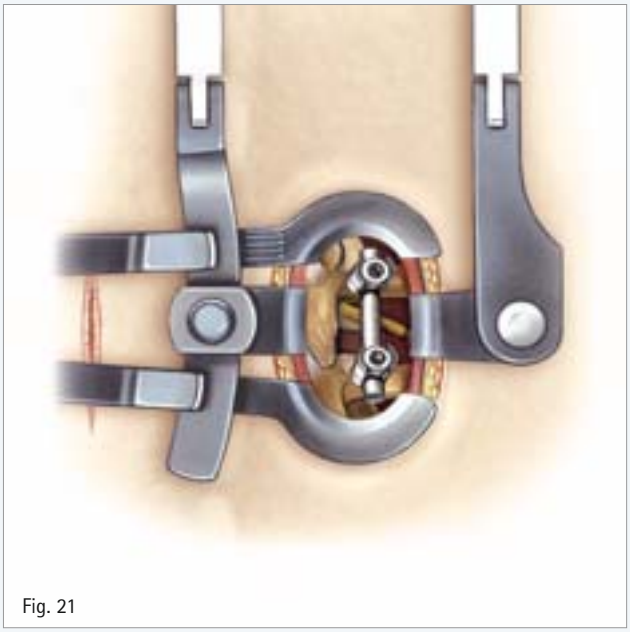


Fig. 21

- *S⁴ Spinal System*
- *See surgical technique 026702*

Application of rod and set screw (Fig. 20)

- Final assembly of the S⁴ Spinal System.
- Compression is applied to the pedicle screws to support the contact area between the T-Space implant and the endplates.
- Final tightening of the S⁴ pedicle screws and removal of the tabs.

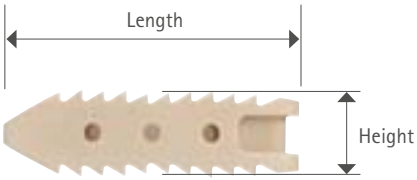
S⁴ screw positioning on the contra-lateral side (Fig. 21)

- S⁴ Spinal System is applied on the contra-lateral side.

Aesculap® T-Space® PEEK

E1

Ordering information – T-Space PEEK implants



Art. no.	Description	Height	Width	Length	Angle
SJ907P	T-Space PEEK	7 mm	11.5 mm	26 mm	5°
SJ908P	T-Space PEEK	8 mm	11.5 mm	26 mm	5°
SJ909P	T-Space PEEK	9 mm	11.5 mm	26 mm	5°
SJ910P	T-Space PEEK	10 mm	11.5 mm	26 mm	5°
SJ911P	T-Space PEEK	11 mm	11.5 mm	26 mm	5°
SJ912P	T-Space PEEK	12 mm	11.5 mm	26 mm	5°
SJ913P	T-Space PEEK	13 mm	11.5 mm	26 mm	5°
SJ915P	T-Space PEEK	15 mm	11.5 mm	26 mm	5°
SJ917P	T-Space PEEK	17 mm	11.5 mm	26 mm	5°
SJ937P	T-Space PEEK	7 mm	11.5 mm	30 mm	5°
SJ938P	T-Space PEEK	8 mm	11.5 mm	30 mm	5°
SJ939P	T-Space PEEK	9 mm	11.5 mm	30 mm	5°
SJ940P	T-Space PEEK	10 mm	11.5 mm	30 mm	5°
SJ941P	T-Space PEEK	11 mm	11.5 mm	30 mm	5°
SJ942P	T-Space PEEK	12 mm	11.5 mm	30 mm	5°
SJ943P	T-Space PEEK	13 mm	11.5 mm	30 mm	5°
SJ945P	T-Space PEEK	15 mm	11.5 mm	30 mm	5°
SJ947P	T-Space PEEK	17 mm	11.5 mm	30 mm	5°
SJ967P	T-Space PEEK	7 mm	11.5 mm	34 mm	5°
SJ968P	T-Space PEEK	8 mm	11.5 mm	34 mm	5°
SJ969P	T-Space PEEK	9 mm	11.5 mm	34 mm	5°
SJ970P	T-Space PEEK	10 mm	11.5 mm	34 mm	5°
SJ971P	T-Space PEEK	11 mm	11.5 mm	34 mm	5°
SJ972P	T-Space PEEK	12 mm	11.5 mm	34 mm	5°
SJ973P	T-Space PEEK	13 mm	11.5 mm	34 mm	5°
SJ975P	T-Space PEEK	15 mm	11.5 mm	34 mm	5°
SJ977P	T-Space PEEK	17 mm	11.5 mm	34 mm	5°

Ordering information – Preparation instruments

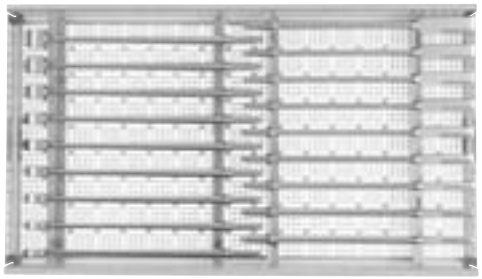
FJ610 T-Space PEEK instrumentation complete (FJ633R and FJ611R)

consisting of:	Art. no.	Description	Recommended	Optional
	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	Straight curette	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 perforated basket lid	1	
	TE989	Graphic template for FJ633R	1	

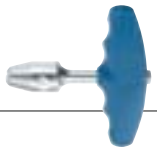
Recommended container for tray FJ633R: JK441/JN441 and lid JK489

Aesculap® T-Space® PEEK

Ordering Information – implantation instruments



Art. no.	Description	Recommended	Optional
FJ647R	Distractor, 7 mm	1	
FJ648R	Distractor, 8 mm	1	
FJ649R	Distractor, 9 mm	1	
FJ650R	Distractor, 10 mm	1	
FJ651R	Distractor, 11 mm	1	
FJ652R	Distractor, 12 mm	1	
FJ653R	Distractor, 13 mm	1	
FJ655R	Distractor, 15 mm	1	
FJ657R	Distractor, 17 mm	1	
FJ667R	T-Space trial, 7 mm	1	
FJ668R	T-Space trial, 8 mm	1	
FJ669R	T-Space trial, 9 mm	1	
FJ670R	T-Space trial, 10 mm	1	
FJ671R	T-Space trial, 11 mm	1	
FJ672R	T-Space trial, 12 mm	1	
FJ673R	T-Space trial, 13 mm	1	
FJ675R	T-Space trial, 15 mm	1	
FJ677R	T-Space trial, 17 mm	1	
FJ619R	T-Space curved trial, 7 mm		1
FJ620R	T-Space curved trial, 8 mm		1
FJ621R	T-Space curved trial, 9 mm		1
FJ622R	T-Space curved trial, 10 mm		1
FJ623R	T-Space curved trial, 11 mm		1
FJ624R	T-Space curved trial, 12 mm		1
FJ625R	T-Space curved trial, 13 mm		1
FJ627R	T-Space curved trial, 15 mm		1
FJ629R	T-Space curved trial, 17 mm		1



Art. no.	Description	Recommended	Optional
SJ033R	T-handle for distractors and trials	2	
FJ051R	Retractor S	1	
FJ052R	Retractor M	1	
FJ053R	Retractor L	1	
FJ054R	Retractor XL	1	
FJ615R	Packing block	1	
FJ603R	Offset inserter	1	
FJ604R	Straight inserter	1	
FJ605R	Curved inserter	1	
FJ613R	Impactor	1	
FJ611R	Tray for implantation instruments	1	
JH217R	Wide perforated basket lid	1	
TF023	Graphic template for FJ611R	1	

Recommended container for tray FJ611R: JK442/JN442 and lid JK489

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