

Sacral Bars. Fixation of the posterior pelvis in cases of fractures or sacroiliac joint dislocations.

Surgical Technique



This publication is not intended for distribution in the USA.

Instruments and implants approved by the AO Foundation.

 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.

Processing, Reprocessing, Care and Maintenance

For general guidelines, function control and dismantling of multi-part instruments, as well as processing guidelines for implants, 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, as well as processing of Synthes non-sterile implants, please consult the Important Information leaflet (SE_023827) or refer to:

<http://emea.depuyshnthes.com/hcp/reprocessing-care-maintenance>

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Sacral Bars. Fixation of the posterior pelvis in cases of fractures or sacroiliac joint dislocations.

- Sacral washers prevent the rounded sacral nuts from pressing into the cortical bone
- The sacral bars feature a trocar tip for easy passage through the soft tissues
- The sacral bars are fully threaded and are available in 200 mm or 260 mm lengths
- The implants are not in direct contact with the neurological structures of the Os sacrum which reduces the risk for iatrogenic injuries
- Kits available sterile and nonsterile



In 1958, the AO formulated four basic principles, which have become the guidelines for internal fixation.^{1,2} Those principles as applied to the sacral bars are:

Anatomic reduction

Fixation of sacral fractures and fracture dislocations of the sacroiliac joint with the threaded sacral bars allows the restoration of anatomical relationships.

Stable fixation

Hexagonal and rounded sacral nuts can be wedged against each other and thus compression can be achieved. The recommended two-bar technique adds stability to the construct.

Preservation of blood supply

The sacral bars bridge the sacrum and thus guarantee the preservation of blood supply in the sacrum and the sacroiliac joints.

Early, active mobilization

The implants, combined with AO technique, provide stable fracture fixation with minimal trauma to vascular supply and create an environment for bone healing.

¹ Müller ME, Allgöwer M, Schneider R, Willenegger H (1995) Manual of Internal Fixation. 3rd, expanded and completely revised ed. 1991. Berlin, Heidelberg, New York: Springer

² Rüedi TP, Buckley RE, Moran CG (2007) AO Principles of Fracture Management. 2nd expanded ed. 2002. Stuttgart, New York: Thieme

Indications

The Synthes Sacral Bars are indicated for fixation of the posterior pelvis, in areas of the posterior superior iliac spine, posterior inferior iliac spine, for sacral fractures, and fracture dislocations of the sacroiliac joint.

Preoperative Planning

Instruments and implants

01.100.763	Sacral Bar Set, Bar Length 200 mm
or	
01.100.766	Sacral Bar Set, Bar Length 260 mm

388.720	Bolt Cutter
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321.160	Combination Wrench Ø 11.0 mm
or	
321.200	Ratchet Wrench for Nut, hexagonal, 11.0 mm

This procedure can be performed manually using a universal chuck with T-handle, or with power equipment.

Precautions:

- In the case of bilateral fracture, it is necessary to have at least one side of stable reduction using a sacroiliac screw or posterior plate in addition to inserting sacral bars.
 - The correct length of the sacral bar should extend 25–30 mm on either side of the posterior iliac crest (bar will be cut to size intraoperatively).
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For additionally required instruments, please see page 12.

1

Position the patient

The patient is placed in the prone position.

2

Make the incisions

Make slightly curved bilateral incisions just lateral to the posterior superior iliac spine. The incision on the fracture side should be large enough to allow for direct visualization and reduction.

3

Reduce and stabilize the fracture

Reduce the fracture using pointed reduction forceps from the medial sacral crest to the lateral aspect of the posterior superior iliac spine, or from the opposite side using pelvic reduction forceps. After reduction, two Kirschner wires should be placed across the sacroiliac joint for provisional stabilization.



4

Drill gliding holes

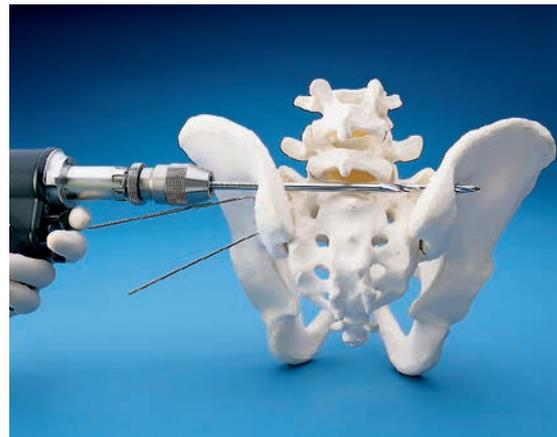
Instrument

310.60J	Drill Bit 6.0 mm, for Jacobs Chuck, length 195 mm
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Drill a set of gliding holes using a 6.0 mm drill bit. The holes should be located so that the first bar is placed at the level of L5/S1 interspace as seen on C-arm or by palpation.

The second set of holes should be at least 1.5 cm inferior to the first.

When drilling the gliding hole, make sure that the drill exits the medial aspect of the posterior superior iliac spine above the sacral lamina. Care must be taken to ensure that there is enough bone in the posterior superior iliac spine to hold the second bar. If not, use a sacroiliac screw or a posterior plate.



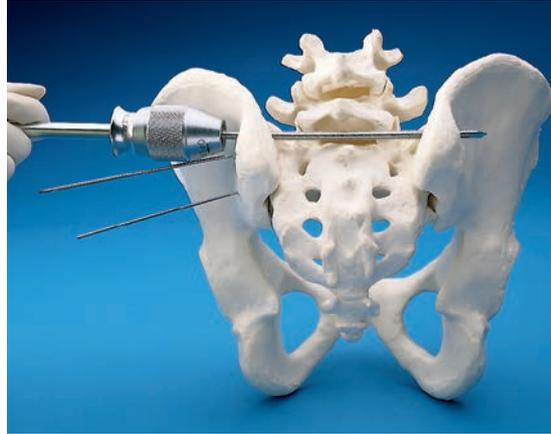
5**Insert first sacral bar****Instruments**

296.763 Threaded Sacral Bar, length 200 mm,
Stainless Steel

or

296.766 Threaded Sacral Bar, length 260 mm,
Stainless Steel

Drive the sharp trocar tip of the threaded sacral bar through the predrilled hole in the contralateral iliac spine. The sacral lamina must be seen, to ensure that the bar passes dorsal to it and does not enter the sacral canal; it may pass through the medial sacral crest.

**6****Apply washers and rounded nuts****Instruments**

296.758 Washer Ø 6.0 mm

296.757 Nut, rounded, Ø 6.0 mm

321.160 Combination Wrench Ø 11.0 mm

or

321.200 Ratchet Wrench for Nut,
hexagonal, 11.0 mm

Place a 6.0 mm washer on each end of the sacral bar to prevent the nuts from pressing into the bone.

Mate the 6.0 mm rounded nuts to the sacral washers. Tighten with an 11 mm wrench to obtain compression.



7

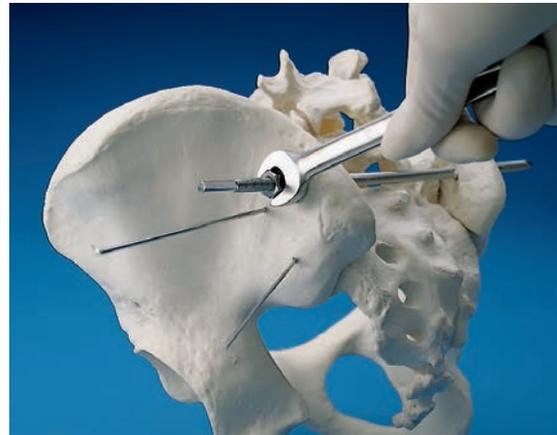
Apply hexagonal nuts

Instruments

296.759	Nut, hexagonal, Ø 6.0 mm
321.160	Combination Wrench Ø 11.0 mm
or	
321.200	Ratchet Wrench for Nut, hexagonal, 11.0 mm

Add 6.0 mm hexagonal nuts to maintain compression. With a hexagonal wrench, wedge the hexagonal nuts against the rounded sacral nuts.

Precaution: Pay attention not to over-compress the construct.



8

Place second bar

Repeat steps 5–7 for insertion and fixation of the second sacral bar. Two bars must be used to avoid rotation.

Remove Kirschner wires.



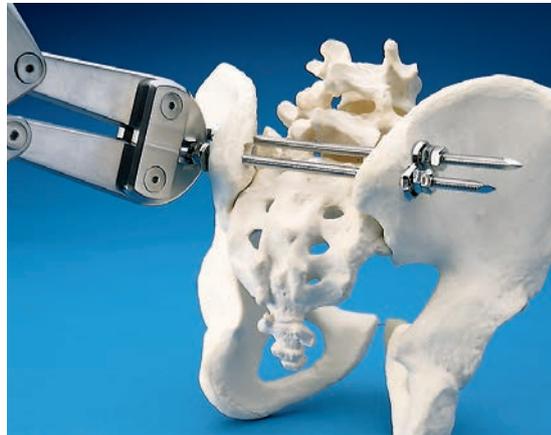
9

Trim sacral bars

Instrument

388.720	Bolt Cutter
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Use the bolt cutter to cut the ends of the sacral bars flush with the hexagonal nuts.



Implant Removal

In case the physician decides to remove the implants, implants can be removed by using general surgical instruments.

Sacral Bar Sets

Sets

Each set contains the necessary sterile implants and drill bit for one surgical procedure as described in the technique guide.

01.100.763 Sacral Bar Set,
Bar Length 200 mm

01.100.766 Sacral Bar Set,
Bar Length 260 mm

01.100.763 contains the following implants and instruments:

Art. No.	Description	Units
296.763S*	Threaded Sacral Bar, length 200 mm, Ø 6.0 mm, Stainless Steel, sterile	2
296.757S*	Nut, rounded, Ø 6.0 mm, sterile	4
296.758S*	Washer Ø 6.0 mm, sterile	4
296.759S*	Nut, hexagonal, Ø 6.0 mm, sterile	4
310.60JS	Drill Bit 6.0 mm, for Jacobs Chuck, length 195 mm, sterile	1

01.100.766 contains the following implants and instruments:

Art. No.	Description	Units
296.766S*	Threaded Sacral Bar, length 260 mm, Ø 6.0 mm, Stainless Steel, sterile	2
296.757S*	Nut, rounded, Ø 6.0 mm, sterile	4
296.758S*	Washer Ø 6.0 mm, sterile	4
296.759S*	Nut, hexagonal, Ø 6.0 mm, sterile	4
310.60JS	Drill Bit 6.0 mm, for Jacobs Chuck, length 195 mm, sterile	1

*Set includes two packs.

Additional Instruments

The following instruments are additionally required:

321.160 Combination Wrench \varnothing 11.0 mm
or
321.200 Ratchet Wrench for Nut, hexagonal,
11.0 mm



388.720 Bolt Cutter



393.100 Universal Chuck with T-Handle



Also available:

398.860 Pelvic Reduction Forceps, long,
with pointed ball tips, speed lock,
length 400 mm



511.200 Oscillating Drill Attachment



Torque, Displacement and Image Artifacts according to ASTM F 2213-06, ASTM F 2052-06e1 and ASTM F2119-07

Non-clinical testing of worst case scenario in a 3 T MRI system did not reveal any relevant torque or displacement of the construct for an experimentally measured local spatial gradient of the magnetic field of 3.69 T/m. The largest image artifact extended approximately 169 mm from the construct when scanned using the Gradient Echo (GE). Testing was conducted on a 3 T MRI system.

Radio-Frequency-(RF-)induced heating according to ASTM F2182-11a

Non-clinical electromagnetic and thermal testing of worst case scenario lead to peak temperature rise of 9.5 °C with an average temperature rise of 6.6 °C (1.5 T) and a peak temperature rise of 5.9 °C (3 T) under MRI Conditions using RF Coils (whole body averaged specific absorption rate [SAR] of 2 W/kg for 6 minutes [1.5 T] and for 15 minutes [3 T]).

Precautions: The above mentioned test relies on non-clinical testing. The actual temperature rise in the patient will depend on a variety of factors beyond the SAR and time of RF application. Thus, it is recommended to pay particular attention to the following points:

- It is recommended to thoroughly monitor patients undergoing MR scanning for perceived temperature and/or pain sensations.
 - Patients with impaired thermoregulation or temperature sensation should be excluded from MR scanning procedures.
 - Generally, it is recommended to use a MR system with low field strength in the presence of conductive implants. The employed specific absorption rate (SAR) should be reduced as far as possible.
 - Using the ventilation system may further contribute to reduce temperature increase in the body.
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