Surgical Technique

VISIOS. Anterior lumbar intervertebral spacer.
Warning
This description is not sufficient for immediate application of the instrumentation. Instruction by a surgeon experienced in handling this instrumentation 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: www.synthes.com/reprocessing
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: www.synthes.com/reprocessing
Visios is a system of implants and instruments designed for anterior lumbar interbody fusion (ALIF). The system was developed to achieve the following objectives:

– To distract the disc space and restore normal disc height and physiological lordosis, thereby also widening the foramina
– To preserve the integrity of the vertebral body endplates
– To provide an optimal implant/endplate interface, thus considerably limiting the risk of subsidence into the adjacent vertebrae
– To stabilise the pathologically unstable segment
– To support bone growth through the implant

Indications

Lumbar and lumbosacral pathologies for which segmental spondylodesis is indicated, for example:

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

Contraindications

– Vertebral body fractures
– Spinal tumours
– Serious spinal instabilities
– Primary spinal deformities
The Visios cages are radiolucent with three X-ray markers for location purposes (marked red in the illustrations). The two posterior markers are shorter than the anterior marker.

Two cage designs are available:
- Visios cages with 0°/90° grooves for anterior and lateral approaches
- Visios cages with 45° grooves for the anterolateral approach

In both designs the Visios Cages are 30 mm wide and 24 mm deep. The overall height ranges between 9 and 19 mm with 2 mm increments.
Surgical technique

The following surgical technique is described using the example of an anterior approach to L5/S1.

1

Determine approach and size of Visios cage

The approach will depend on the part of the spine to be treated and the surgeon’s preference. The cage can be inserted from the anterior, anterolateral or lateral directions. The insertion technique is identical for both cage designs and all three approaches.

Prior to surgery, estimate the appropriate size of the cage. This initial estimate can be made by comparing the preoperative planning template (X000008) with the adjacent intervertebral discs on a lateral radiograph. With the segment fully distracted, the cage must fit tightly and accurately between the endplates. Use the tallest possible cage so as to maximise segment stability through tension between the longitudinal ligament and the annulus fibrosus.

2

Position patient

The position of the patient will depend on the selected approach. For the management of indications affecting the lower lumbar spine via an anterior approach, the patient is placed in the Trendelenburg position. If the Visios cage is to be inserted via an anterolateral approach – for example for indications affecting a higher part of the lumbar spine – the patient must be placed in a supine or lateral position.
3

Expose disc

For the anterior approach, expose the disc so as to produce an opening on either side of the midline (sagittal plane) corresponding to half the width of the Visios cage. If the blood vessels and/or tissues cannot be retracted sufficiently, an anterolateral or lateral approach may be indicated.

4

Cut window

For the anterior approach, cut a rectangular window, matching the width of the Visios cage in the anterior longitudinal ligament and the annulus fibrosus.

For the anterolateral or lateral approaches, cut a corresponding window in the annulus fibrosus.

A Visios Trial Implant (396.441–446, 396.451–456) can be used to measure the width of the window.

Preserve as much of these structures as possible since they are important for the stability of the operated segment.
5

Prepare disc space

Via the window in the annulus fibrosus, excise the disc material and remove the cartilaginous layers from the endplates until bleeding bone is attained. Adequate cleaning of the endplate is important for the vascular supply to the bone graft. Excessive cleaning, however, may weaken the endplates due to removal of the denser bone of the endplates. If possible prepare the endplates so that their curvature matches that of the Visios cage.

Note: Remove sufficient material from the disc space so as to ensure that no disc material is pushed back during insertion of the Visios trial implant and the cage.

6

Distract segment

Distraction of the segment is essential for restoration of the disc height, widening of the foramina and the stability of the Visios cage.

Use the Distractor (397.086) for spreading the disc space. Distract the segment by squeezing the distractor handle and lock the distraction in place by tightening the locking screw.

Note: The disc space can also be distracted with the Visios trial implants and/or a vertebral body spreader.
7

Select Visios trial implant and mount on holder

The following Visios Trial Implants are available for the anterior and lateral approaches (396.441–446) and for the anterolateral approach (396.451–456):

<table>
<thead>
<tr>
<th>Height</th>
<th>0°/90° (anterior and lateral)</th>
<th>45° (anterolateral)</th>
</tr>
</thead>
<tbody>
<tr>
<td>9 mm</td>
<td>396.441</td>
<td>396.451</td>
</tr>
<tr>
<td>11 mm</td>
<td>396.442</td>
<td>396.452</td>
</tr>
<tr>
<td>13 mm</td>
<td>396.443</td>
<td>396.453</td>
</tr>
<tr>
<td>15 mm</td>
<td>396.444</td>
<td>396.454</td>
</tr>
<tr>
<td>17 mm</td>
<td>396.445</td>
<td>396.455</td>
</tr>
<tr>
<td>19 mm</td>
<td>396.446</td>
<td>396.456</td>
</tr>
</tbody>
</table>

Select the trial implant corresponding to the preoperatively determined cage size and approach, mount on the Holder (397.089) according to the particular approach and secure by fully tightening the knurled nut.

8

Insert Visios trial implant

Slide the trial implant through the distractor blades and insert into the disc space.

If a tight fit is not achieved, try the next larger size. If the trial implant cannot be inserted, try the next smaller size. With the segment fully distracted, the trial implant must fit tightly and accurately between the endplates so that the disc height is preserved when the distractor is removed.

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

Note: The trial implants are not for implantation and must be removed before insertion of the cage.
9

Select Visios cage and mount on holder

The following Visios cages are available for the anterior and lateral approaches (889.961–966) and for the anterolateral approach (889.971–976):

<table>
<thead>
<tr>
<th>Height</th>
<th>0°/90° (anterior and lateral)</th>
<th>45° (anterolateral)</th>
</tr>
</thead>
<tbody>
<tr>
<td>9 mm</td>
<td>889.961</td>
<td>889.971</td>
</tr>
<tr>
<td>11 mm</td>
<td>889.962</td>
<td>889.972</td>
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<tr>
<td>13 mm</td>
<td>889.963</td>
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<td>15 mm</td>
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<tr>
<td>17 mm</td>
<td>889.965</td>
<td>889.975</td>
</tr>
<tr>
<td>19 mm</td>
<td>889.966</td>
<td>889.976</td>
</tr>
</tbody>
</table>

Select the cage corresponding to the trial implant, mount on the holder according to the particular approach and secure by fully tightening the knurled nut.

10

Pack Visios cage with cancellous bone

The cancellous bone can be taken either from the iliac crest or, using the Instrument Set for Vertebral Body Trephine (187.280), from an adjacent vertebral body. Insert the cage, attached to the holder, into the opened Packing Block (397.096) (1), close the packing block lid (2) and tighten the knurled nut (3). Using the Cancellous Bone Impactor (394.581) fill the cage completely with the crushed bone material and press down firmly (4). The cage has to be completely filled with bone graft.

**Note:** Do not sterilise the packing block with gamma radiation.
11

Implant Visios cage
When the cage is ready for implantation, distract the segment. Distraction is maintained by tightening the locking screw on the distractor handle.
Slide the cage through the distractor blades and insert into the disc space.
If necessary, remove the distractor and lightly hammer the cage fully into the disc space.

12

Remove instruments
When the Visios cage is correctly positioned, undo the locking screw on the distractor handle to loosen the distraction.
Carefully remove the distractor while holding the cage and the holder in the correct position. Remove the holder.

13

Verify position of Visios cage
The optimal position for the cage is centred within the vertebral endplates.
Depending on the size of the vertebrae, the anterior edge of the cage will be approximately 3–4 mm behind the anterior edge of the adjacent vertebrae. Verify the AP position of the cage relative to the vertebral bodies under the image intensifier (see planning template).
Additional posterior fixation

Additional posterior instrumentation with translaminar or transpedicular screws considerably enhances the biomechanical stability of the motion segment, regardless of the design of the ALIF implant (Oxland et al., 1997). Such an additional posterior fixation is therefore recommended for improving the stability of the Visios cage. The fixation is performed after implantation of the cage. See bibliography for further details of this technique.

Additional posterior fixation with pedicle screws is indicated for the treatment of spondylolisthesis and is performed prior to cage insertion.

Note: Excessive distraction of the disc space must be avoided in patients with existing posterior fixation, otherwise problems can arise during removal of the distractor blades.

Postoperative management

Mobilization can begin on the first postoperative day. It is advisable for the patient to wear a corset (T.L.S.O or L.S.O) for the first three months after surgery. The patient must be warned against undertaking activities that place excessive stress on the operated spinal area. Physical activities and trauma with adverse effects on the affected vertebrae can lead to failures as a result of loosening and fracture of the endplates.


