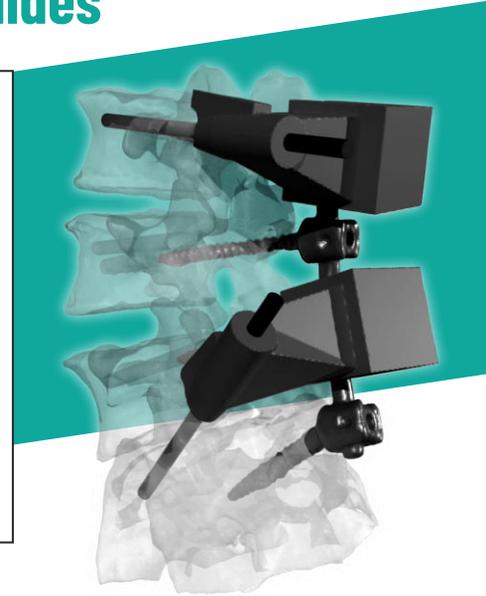


Malposition of the left side pedicle screws. Replacement using 3D guides

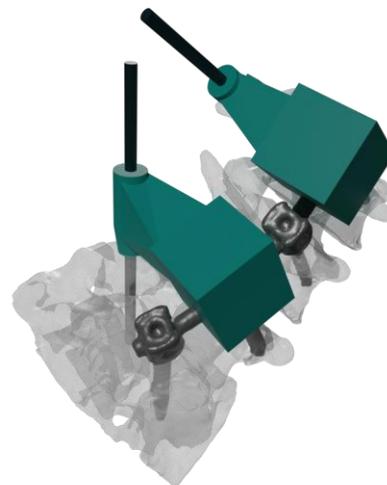
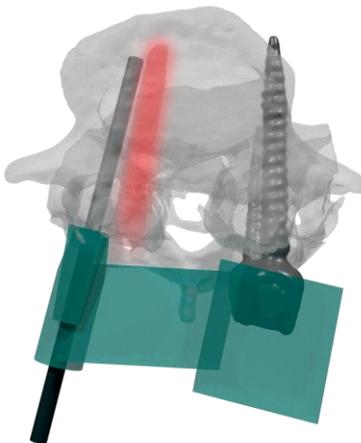
Lumbar degenerative disease is a term used by physicians to describe the natural degeneration of the lumbar spine overtime.

It includes conditions such as **spondylosis** (degeneration of the spinal discs as in osteoarthritis), **spinal stenosis** (narrowing of the spinal canal and the openings through which nerve roots exit) and **spondylolisthesis** (forward sliding of the vertebrae).

In those cases where surgery is required, the use of **TOR JIG® S** system enables an easy and fast pedicle screws placement.



Surgeon	Dr. Antonio Luis Mostaza Saavedra
Hospital	Complejo Asistencial Universitario de León
Patient	Woman with canal stenosis and multilevel spondyloarthritis, decompression and transpedicular arthrodesis L3-S1. She presented with sciatica and excruciating pain in her left lower extremity
Pathology	Malposition of left side pedicle screws
Treatment	Relocation and screws replacement using guides L3-S1
System used	TOR JIG® S : Anatomical biomodel and 4 personalized replacement surgical guides



TOR JIG® S

Personalized surgical guides system for pedicle screws placement

Surgical planning

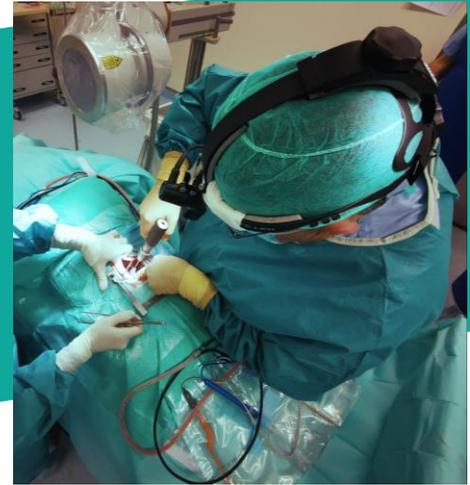
- Screws position and orientation are marked according to the surgeon's prescription.
- 3D anatomical model is made.
- Personalized surgical guides are designed for each case. Finally, the biomodel and the guides are 3D printed.

Surgical process

In the CT scan after a previous surgery, it was identified that several pedicle screws on the left side were not correctly positioned, so it was decided to perform a new surgery to replace them.

In order to ensure that this new intervention is successful, the decision is made to use **TOR JIG® S**.

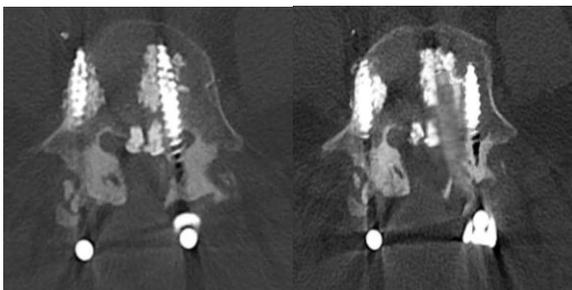
In these cases, surgical guides are simply snapped into place and are perfectly positioned when resting on the opposite side screw



Performance

The use of guides in cases of reintervention is essential. In a replacement, it is sometimes necessary to mark an unusual drilling position and personalized surgical guides allow the screws to be placed more securely in the prescribed location and orientation. .

The surgery was a complete success. The patient confirmed that the pain had completely disappeared.



Preoperative CT



Postoperative monitoring

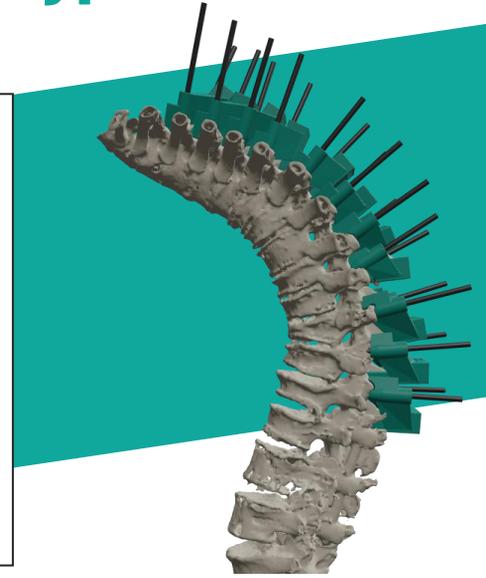
Information about the device. Custom Made Medical Device: Device made to be used on a patient by a practitioner for the surgical treatment of a pathology, being an invasive surgical product, transient use class IIa. Rule 6, Annex VIII, MDR.

Congenital thoracic hyperkyphosis

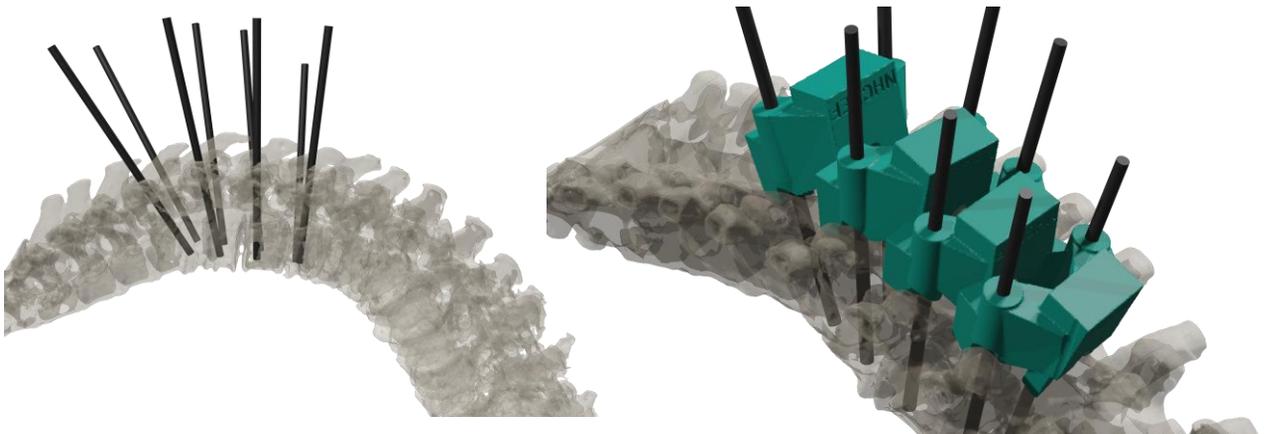
Lumbar degenerative disease is a term used by physicians to describe the natural degeneration of the lumbar spine overtime.

It includes conditions such as **spondylosis** (degeneration of the spinal discs as in osteoarthritis), **spinal stenosis** (narrowing of the spinal canal and the openings through which nerve roots exit) and **spondylolisthesis** (forward sliding of the vertebrae).

In those cases where surgery is required, the use of **TOR JIG® S** system enables an easy and fast pedicle screws placement.



Surgeon	Dr. Antonio Luis Mostaza Saavedra
Hospital	San Juan de Dios (León)
Patient	57 years old - woman, with severe thoracolumbar pain, deviation in the anterior and lateral plane of the spine, as well as breathing difficulties.
Pathology	Congenital thoracic hyperkyphosis
Treatment	Spinal cord decompression and T3-L1 instrumented arthrodesis with transpedicular screw cementation and recovery of the patient's normal position.
System used	TOR JIG® S : Anatomical biomodel and 11 personalized surgical guides.



TOR JIG® S

Personalized surgical guides system for pedicle screws placement

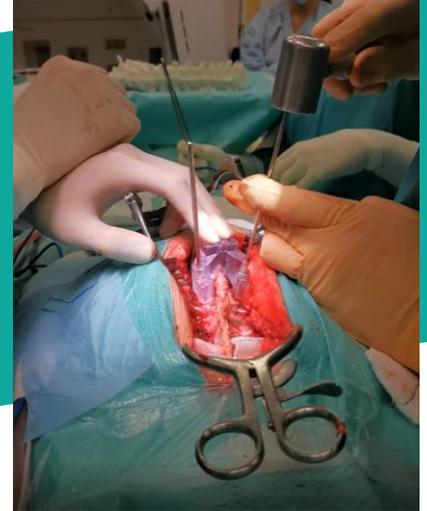
Surgical planning

- Screws position and orientation are marked according to the surgeon's prescription.
- 3D anatomical model is made.
- Personalized surgical guides are designed for each case. Finally, the biomodel and the guides are manufactured via 3D printing.

Surgical process

Due to the huge deviation that this patient's anatomy presented, and the great number of vertebrae that needed to be arthrodesed, the surgery was raised to be very long and complex.

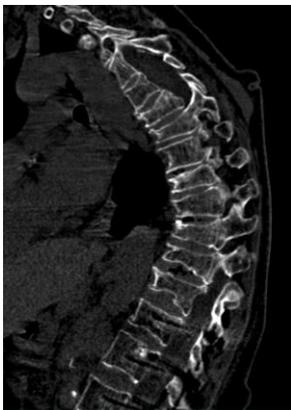
Thanks to the use of **TOR JIG® S** system, more confidence and security in the outcome of the intervention was achieved, operating times were shortened as well as the X Ray exposure of patient and professionals.



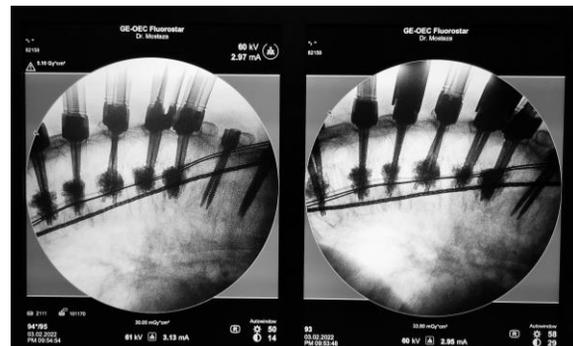
Performance

The surgery was successfully completed. Just days after the intervention, patient showed a remarkable improvement of the position in the coronal and sagittal planes. The pain had decreased and patient's wandering had improved.

It is important to mention that the patient had very small pedicles, so the biomodel and guides were really useful when the surgeon had to place the pedicle screws correctly and with total accuracy.



Preoperative CT



Intraoperative monitoring

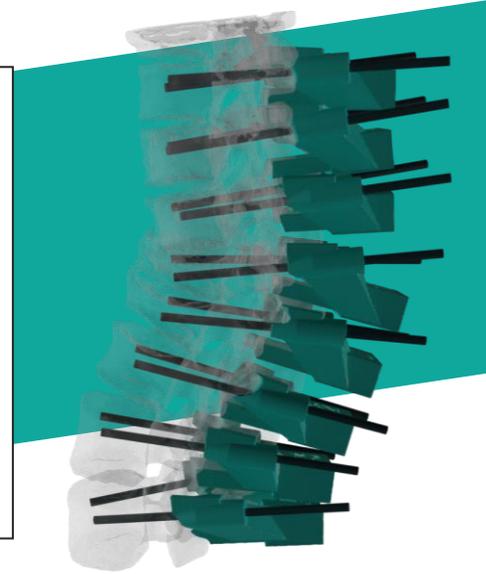
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Vertebral fractures and wedging due to osteoporosis

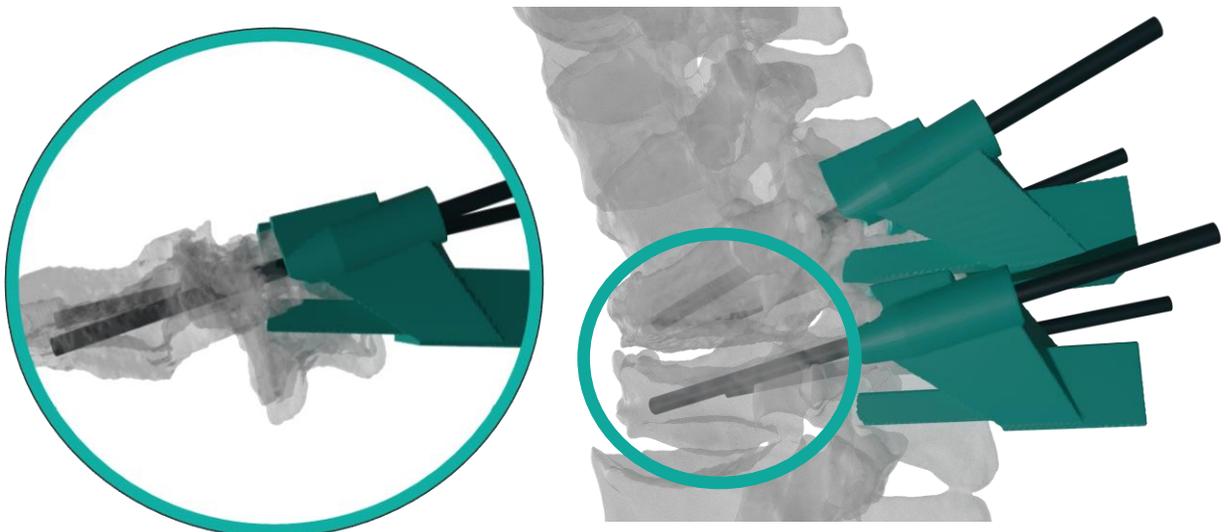
Lumbar degenerative disease is a term used by physicians to describe the natural degeneration of the lumbar spine overtime.

It includes conditions such as **spondylosis** (degeneration of the spinal discs as in osteoarthritis), **spinal stenosis** (narrowing of the spinal canal and the openings through which nerve roots exit) and **spondylolisthesis** (forward sliding of the vertebrae).

In those cases where surgery is required, the use of **TOR JIG® S** system enables an easy and fast pedicle screws placement.



Surgeon	Dr. Antonio Luis Mostaza Saavedra
Hospital	San Juan de Dios (León)
Patient	58 year old woman, with spinal pain, cramps, tiredness and decreased leg strength
Pathology	Kyphosis.
Treatment	Spinal decompression, arthrodesis and T10-L4 cemented instrumentation
System used	TOR JIG® S : Anatomical biomodel and 7 personalized surgical guides.



TOR JIG® S

Personalized surgical guides system for pedicle screws placement

Surgical planning

- Screws position and orientation are marked according to the surgeon's prescription.
- 3D anatomical model is made.
- Personalized surgical guides are designed for each case. Finally, the biomodel and the guides are manufactured via 3D printing.

Surgical process

During the intervention, the guides were of great help as the pedicles were extremely narrow. Thus, screws of the same cross-section as the pedicles had to be placed.

During surgery, the biomodel was consulted to assess which vertebral decompression to perform, taking measurements on it. It was also possible to check the positioning of the screws in the pedicle, even placing the screws on the pedicle, to see whether or not it would fracture with a certain type of drill bit.



Performance

The biomodel helps to understand the patient's osteodegenerative pathology and to approach surgery with the three-dimensional anatomy learned. The use of the hands-free technique for this type of case reduces the probability of success in the intervention, as it is easy to exceed the limits of the pedicle. The surgery generated results such as the disappearance of pain, improvement of strength in the lower extremities and improvement of the kyphosis.



Preoperative
CT



Postoperative
monitoring

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Degenerative scoliosis

Lumbar degenerative disease is a term used by physicians to describe the natural degeneration of the lumbar spine overtime.

It includes conditions such as **spondylosis** (degeneration of the spinal discs as in osteoarthritis), **spinal stenosis** (narrowing of the spinal canal and the openings through which nerve roots exit) and **spondylolisthesis** (forward sliding of the vertebrae).

In those cases where surgery is required, the use of **TOR JIG® S** system enables an easy and fast pedicle screws placement.



Surgeon	Dr. Antonio Luis Mostaza Saavedra
Hospital	San Juan de Dios (León)
Patient	80 years old man with dorsolumbar pain and functional impotence, gait claudication, as well as coronal and sagittal tilt to the left.
Pathology	Degenerative scoliosis
Treatment	Descompresión radicular, artrodesis transpedicular, partial scoliosis correction T11-S1.
System used	TOR JIG® S : Anatomical biomodel and 8 personalized surgical guides



TOR JIG® S

Personalized surgical guides system for pedicle screws placement

Surgical planning

- Screws position and orientation are marked according to the surgeon's prescription.
- 3D anatomical model is made.
- Personalized surgical guides are designed for each case. Finally, the biomodel and the guides are manufactured via 3D printing.

Surgical process

The main objective of this type of surgery is to achieve the correct positioning of the spine, so that the patient's pain is reduced, so that he/she can recover his/her daily activity as soon as possible. The **TOR JIG S** system facilitates the proper placement of the pedicle screws quickly and accurately, a key stage during surgery.



Performance

After surgery, the patient immediately regained what would be considered normal positioning. As a result, the patient's pain is reduced and walking is improved.



Preoperative CT



Postoperative CT

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