Herniated lumbar disc: a full endoscopic transforaminal resection

Courstesy of Dr. Stefan Hellinger - Orthopedic surgeon, Spine surgeon, Consultant at ISAR Klinikum, Munich, Germany

Minimally invasive surgical techniques in spine surgery, such as percutaneous needle placement techniques or percutaneous fusions, have become an important part of the treatment offering.

Endoscopic surgical decompression is an option considered by patients fearing potential epidural scarring and perineural fibrosis that could lead to failed back surgery syndrome.

Such procedures require effective surgical equipment and high performance fluoroscopic technology.

Patient History

A 39 year old male was admitted for treatment with an uncontained disc herniation causing intervertebral lumbar pain radiating down to the left leg.

Conservative therapy performed since 2013 had delivered inconclusive results. The patient approached the hospital with a request for minimally invasive treatment, since he feared the potential consequences associated with epidural scar formation after open microsurgery.

The surgical technique chosen was decompression through partial discectomy via posterolateral endoscopy.

Upon admission, the patient complained of pain in the left leg up to VAS 7. The shooting pains would increase when he would bend or sit down, limiting daily activities.

At the time of admission, the patient presented a limp in his right leg. The spine showed a deviation to the right, induced by a muscle spasm. Reclination was up to 10°. Forward bending was reduced to 90cm (from fingertips to the floor). Laségue sign was 30° for the left leg and 60° for the right leg with crossing pain.

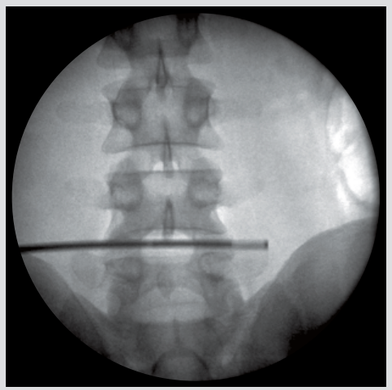
Pre-op MRI images in Sagittal and Axial planes showing an extruded disc at L4-L5, elevating nerve root and dura in inferior part of the foramen.

The surgical technique confirmed for this case was a transforaminal approach due to the location of the extruded disc material at L4-L5 in front of the intervertebral foramen.
In this case, this was the most efficient way to access the disc whilst minimizing trauma, avoiding a laminectomy going through the spinal channel from the dorsal access.

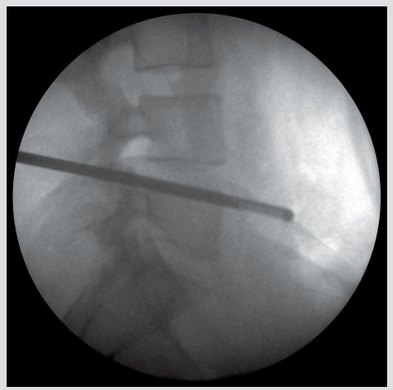
The MRI showed an extruded disc L4-L5 left lateral elevating nerve root and dura at the inferior foramen causing the muscle spasm.

The posterolateral approach to the foramen with a 6mm sheath was performed under fluoroscopy. Fluoroscopic guidance is necessary in particular for going directly to the lateral side of the disc hernia.

Images acquired with the OEC Fluorostar Compact C-arm. The incision level is identified using fluoroscopy, with antero posterior and lateral views obtained by positioning the C-arm to obtain squared vertebrae. A 5mm skin incision is made for the posterolateral access, which is identified with a mark drawn on the patient's skin based on the fluoroscopic images.

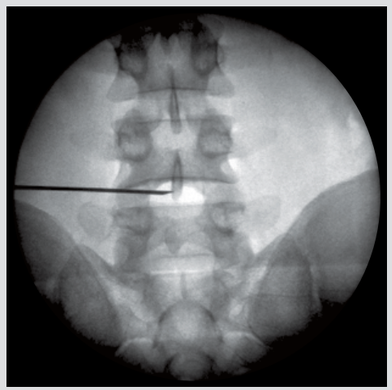


Antero Posterior (AP) fluoroscopy view of L4-L5.



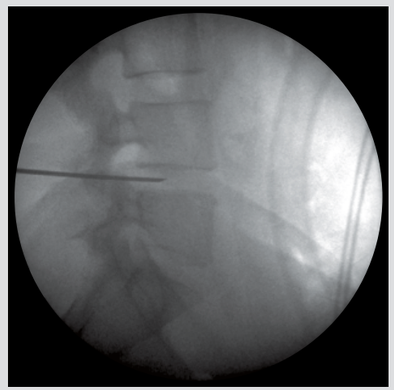
Lateral fluoroscopy view of L4-L5.

A puncture needle is inserted into the disc via process of the facet.



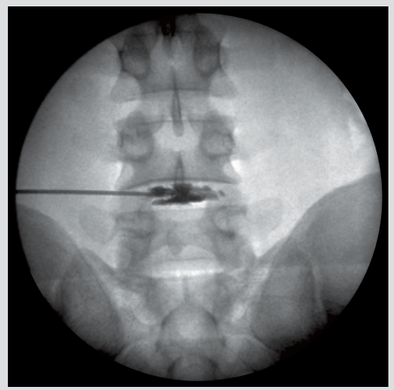
Antero Posterior fluoroscopy view of L4-L5.

the foramen, going over the superior articular

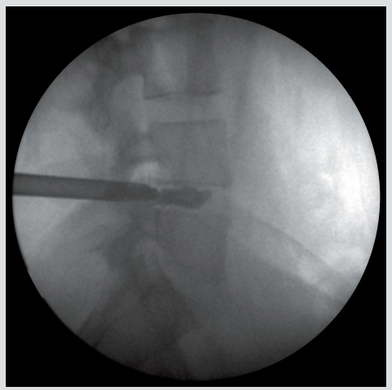


Lateral fluoroscopy view of L4-L5.

The endoscope cannula is introduced with fluoroscopic guidance and a special facet raspier is used to widen the extradiscal entrance. A discography is performed to verify the penetration of the tools inside the disc, marking the location of the extruded disc material and staining it with indigo carmine dye to guide the selective removal of disc material.



Antero Posterior fluoroscopy view.



Lateral fluoroscopy view of L4-L5.

Treatment

The patient was positioned for a conventional transforaminal approach, in prone position. In selected cases, lateral positioning is possible to facilitate the routing of the sheath from iliac crest to L4-L5. The procedure is performed under local anesthesia to control the patient's pain and to prevent damage to the root of the nerve, as done with neuromonitoring systems. It is an important factor for a fast recovery after the surgery.

Results

The sequestrated hernia was totally removed. The elevated nerve root and dura came into view fully decompressed. Bleeding was stopped by a special high radiofrequency probe.

Conclusion

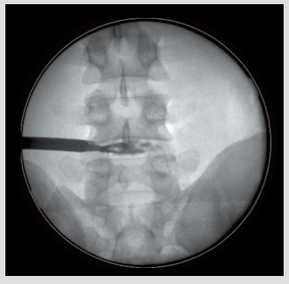
The patient returned for a follow-up consultation and his pain was significantly reduced.

Resection of hernia with the endoscope

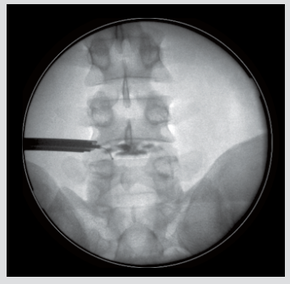
Final endoscopic verification.

Dr. Stefan Hellinger, Orthopedic surgeon, Spine surgeon, Consultant at ISAR Klinikum, Munich, Germany
After receiving training in orthopedic surgery from a pioneer in minimally invasive and endoscopic joint surgery, Dr. Hellinger applied the knowledge and skills that he acquired to spine surgery. Today, his daily work involves new procedures ranging from disc decompression to fusion, which helps him reduce procedure-related problems.

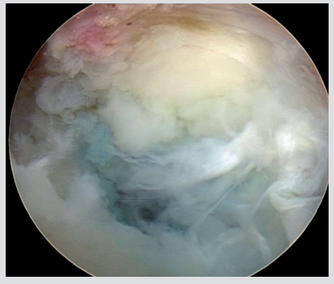
AP view of L4-L5.



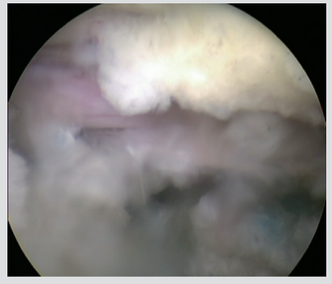
AP view of L4-L5.



Extruding hernia stained with blue indigo carmine dye.



Extruding hernia resection final control



Images acquired with the OEC Fluorostar Compact C-arm

Dr. Hellinger was a paid consultant for GE Healthcare and was compensated for participation in this testimonial. The statements by Dr. Hellinger described here are based on his own opinions and on results that were achieved in his unique setting. Since there is no "typical" hospital and many variables exist, i.e. hospital size, case mix, etc.. there can be no guarantee that other customers will achieve the same results.

Case Report
Spine surgery