Case Report

UNLEASH™ MIS TLIF Solution

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Case Report **UNLEASH™ MIS TLIF Solution**

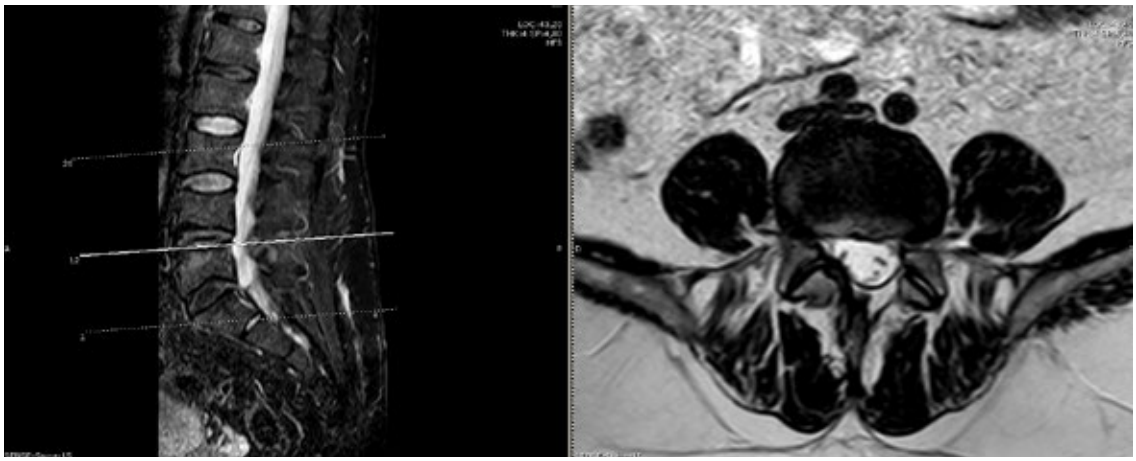
Patient history

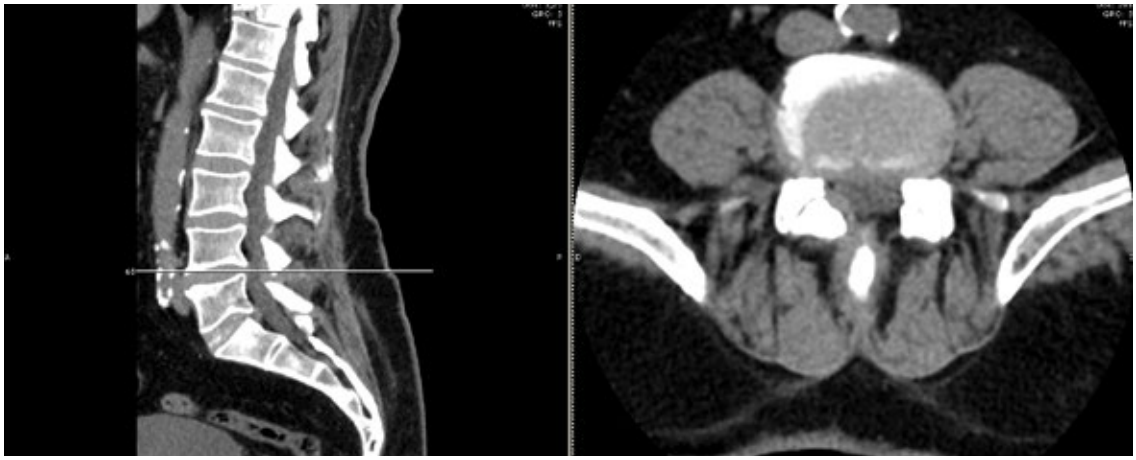
77 year old male with a previous surgery some years before in another hospital; he underwent a left L4L5 hemilaminectomy to treat a disc herniation.

Preoperative analysis

Why did I decide to use the MIS TLIF solution ?

Main complain was invalidating long lasting low back pain. No results after months of conservative treatment. In the MRI indirect signs of instability (black disck with Modic changes, increase of fluid in facets). Because of all that fusion was proposed.





Previous surgery in the right side (I wanted to avoid going through scar tissue), age (77) and comorbidities (HTA) made me think MIS option would be better. LLIF could be an option, may be ALIF also, but being L4L5 level, TLIF has less complication rate (LLIF has a higher rate of neurologic complications at that level and ALIF can have devastating vascular complications). I decided to go from contralateral side (left), as stabilization and fusion was the main goal so no side needed an special decompression and right side needed to be avoided.

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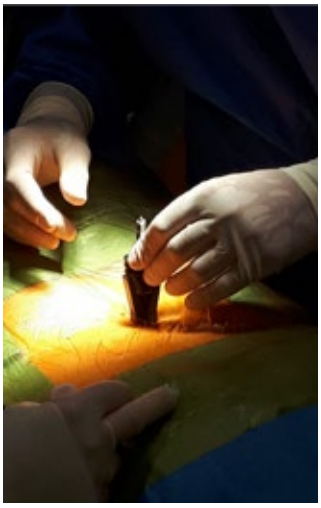
Intraoperative analysis

Screw placement – VIPER PRIME™ System

VIPER PRIME was the first choice because of its simplicity of use. In a case study, VIPER PRIME demonstrated a decrease in mean time for preparation, tapping and screw insertion (PTS) when compared to the VIPER 2 MIS Spine System.[1] As the patient was an elderly man and shortness of anestethical time and positioning in the prone position are important details.

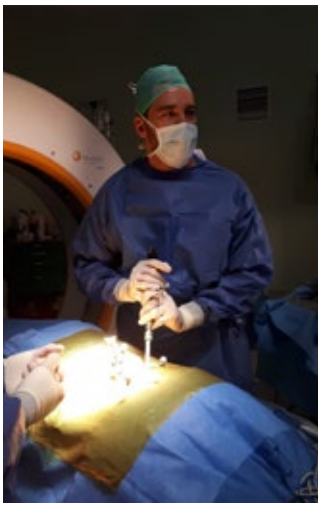
Surgical Technique

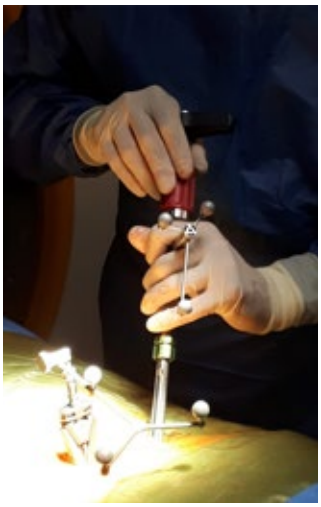
Step 1- Patient positioning



Step 2- Navigation array reference insertion

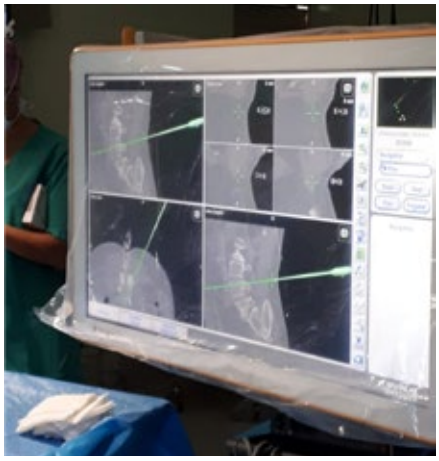
Step 3- CT for navigation

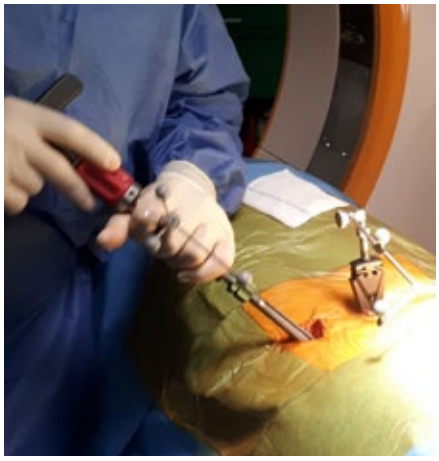




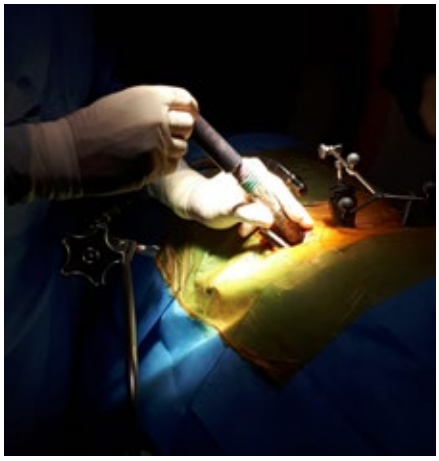
Step 4- Contralateral screws insertion

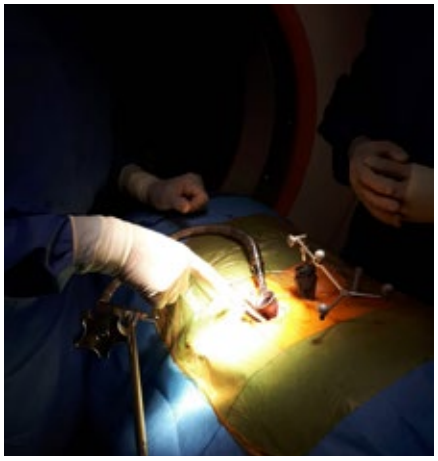
Intraoperative analysis (continued)

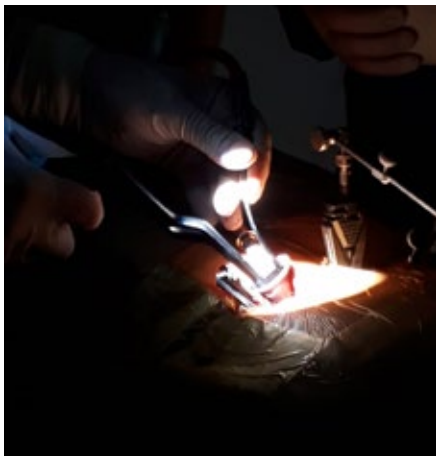


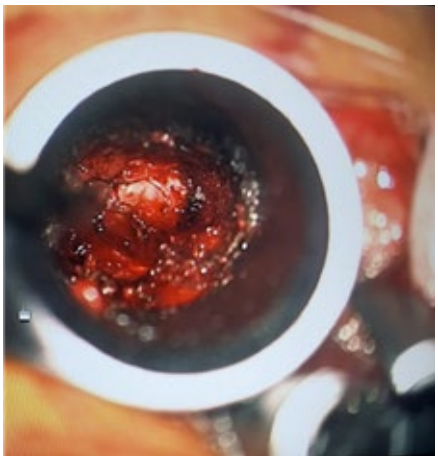


Step 5- Ipsilateral screws insertion









Step 6- TLIF (decompression and fusion)

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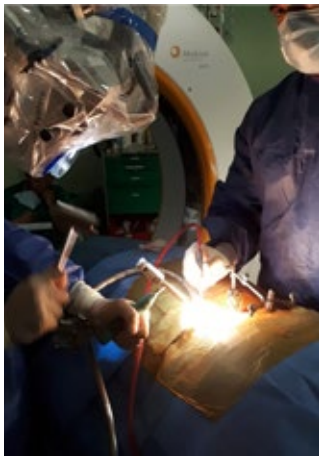
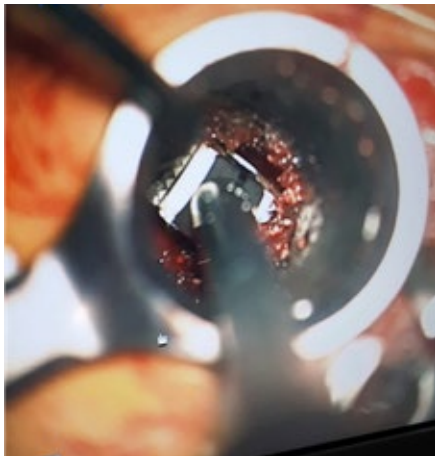
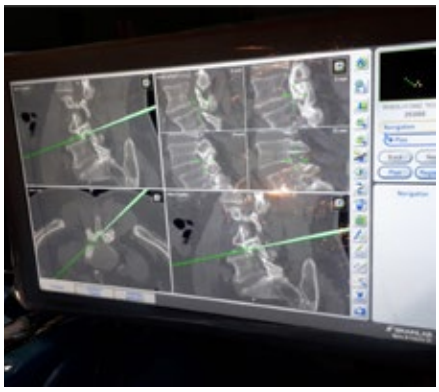
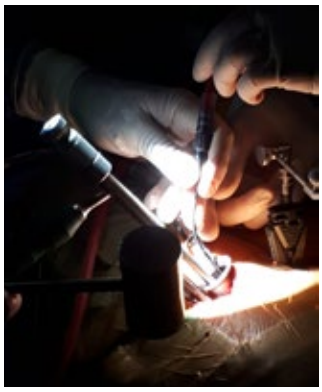
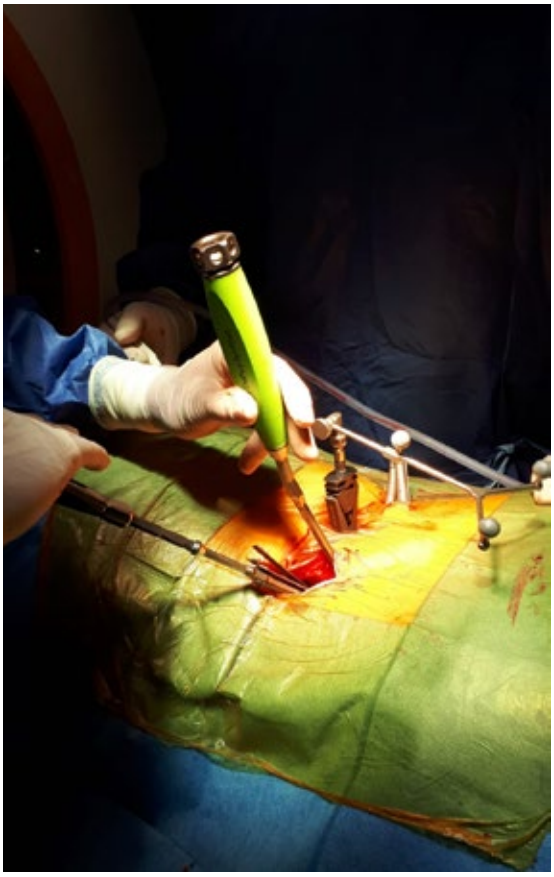




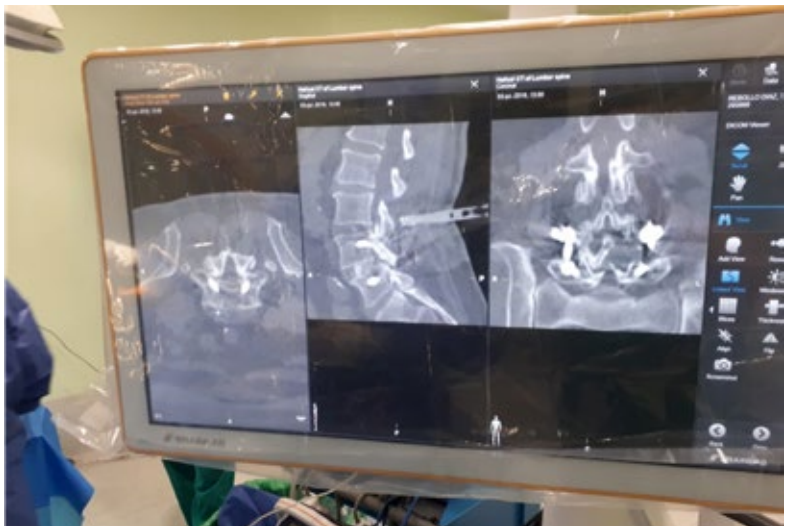




Step 6- TLIF (decompression and fusion) (continued)



Step 7- Rods insertion and caps tightening



Step 8- CT for postop control

Step 9- Removal of extensions

Step 10- Closure

Intraoperative analysis (continued)

Screw placement – VIPER PRIME

10 mm reduction is ok for spondylo grade 1 or 2. In the case of high grade spondylolisthesis sometimes more complex surgeries are needed (in some cases even anterior and posterior approaches combined); but even in those cases VIPER PRIME can be a part in the surgical procedure and patient can benefit also from its characteristics.

Navigation´s main advantages are:

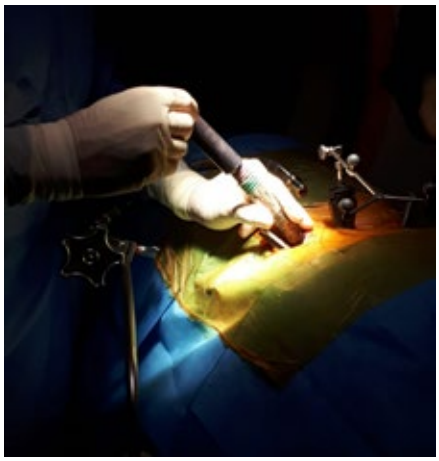
- Lowering the amount of radiation for the surgical team.
- Orientation during discectomy and cage placement

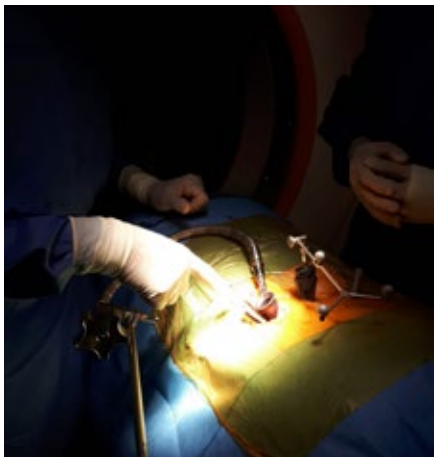
Access- retractor

Different types of retractor may be use for MIS TLIF. I prefer tubular retractor compared to valve retractors because I found tubular more versatile; contralateral decompression is easier with rigid tubes (compared to valves), less muscle gets into the surgical field, and angulation cranio-caudally is easier, same as tilting to the contralateral side. Also there is no problem for insertion of usual size of TLIF cages using a 22 mm diameter rigid tube.

Insight tube has the additional advantage of the "Leyla" type mobile arm, making positioning of the tubes easier and quicker.

Compatibility with viperprime- with conventional MIS screws (percutaneous), based in "towers", diameter of the screw-tower construction is usually large (around 2 cm or even larger), making almost always impossible to position the tube between the screws. With Viper Prime, that is almost always possible (only in some L5S1 cases it is not possible to do that). Positioning the 4 screws before doing the decompression and cage insertion allows to navigate with full accuracy the insertion of the screws (if ipsilateral screws are inserted after the cage, then navigation is not completely "real", as some distraction has been applied by the cage to the space and surgeon must rely on previously placed k-wires (that can move or inadvertently advance into the pelvis during surgery) or a new CT is needed).





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Discectomy - CONCORDE® Clear MIS Discectomy Tool

One of the most important surgical steps, directly related to the fusion rate, in MIS TLIF is performing and adequate discectomy, so every instrument that helps in achieving that goal is a good tool.

Disc cleaning is done with pitutitaries, scrapers, paddle distractors, and concorde clear. Careful positioning of the device inside the disc space avoiding suction in the pathway is essential to prevent dural or nerve injuries.

Cage placement

Both TPAL and OPAL type cages are good options for MIS TLIF. In the case lordosis is one of the main goals of the surgery, probably TPAL anteriorly placed is a better option. OPAL has the advantage of an easiest straight trajectory for tubular implantation, as for the TPAL in many cases surgeon must tilt the tube when rotating the implant.

Navigation

3D Navigation has been used for planning surgical incisions, for the insertion of the screws, and for the positioning of the tubular retractor, orientation during facetectomies and cage placement. Intraoperative CT with 3D Airo was used before closing for assessment of correct implant positioning. Can also be used in case of need for assessment of degree of decompression.

Postoperative follow-up

MIS TLIF patients usually are discharged from our hospital 1-3 days after surgery, according to postp pain, wound healing, comorbidities and social issues. A rigid orthesis is prescribed for 2-3 months for walking and clinical and simple lateral and AP XRays follow up are made at 1,3, 6 and 12 months after surgery.

References:

1. Grossi et al. Reduction in Pedicle Screw Placement Time with a Novel Guidewireless Pedicle Screw System for Minimally Invasive Spine Surgery: Initial Findings. Poster Presented at the 24 th Annual International Meeting, ISPOR 2019.

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Results in other cases may vary.

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