

# FLASH<sup>™</sup> Navigation with 7D Technology

CASE STUDY-L3-S2AI



### Surgeon Profile

**SURGEON**  
Douglas Orndorff, MD

**LOCATION**  
Mercy Regional  
Medical Center  
Durango, CO

### Case Highlights

- 10 screws guided
- Registration performed
  - Registration workflow time: 35.3 seconds
  - 7D processing time: 3.5 seconds
  - Points registered: 1,487

### Clinical Presentation

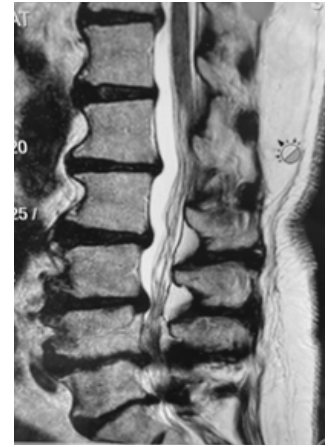
A 72-year-old female presented with L3-S1 Lumbar Spondylosis, L3/L4 Retrolisthesis and Severe lumbar spinal stenosis with neurogenic claudication. She failed exhaustive non-operative options prior to being scheduled for surgery. She was treated for osteoporosis. Once she completed her therapy and obtained medical clearance, she was scheduled for a Lateral Lumbar Interbody Fusion (LLIF), L3-S1 laminectomy and decompression, and an L3-S2 Posterior instrumented fusion with Bilateral Sacroiliac Fusion with Instrumentation.



Preoperative X-ray of lumbar spine showing spondylosis, retrolisthesis, and spinal stenosis.



Preoperative lateral x-ray showing preoperative alignment measurements for surgical planning.

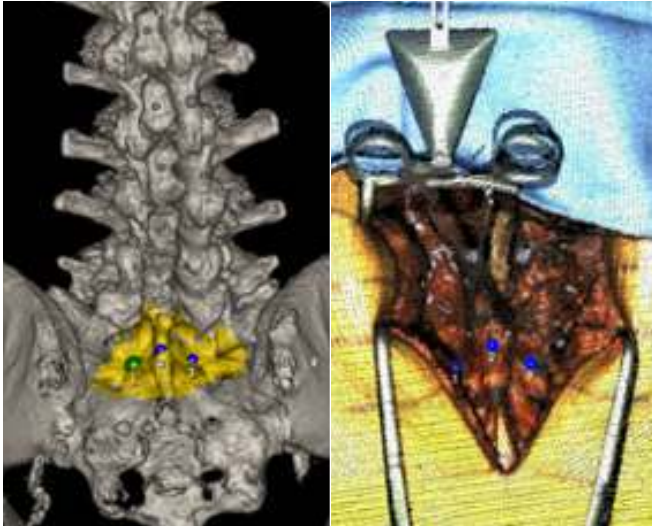


Sagittal MRI of lumbar spine showing severe spinal stenosis with neurogenic claudication.

### Surgical Procedure

The decision was made for the patient to undergo lateral decompression with Lateral Lumbar Interbody Fusion (LLIF) interbody implants at L3-L4 and L4-L5, a posterior spinal instrumented fusion with Mariner<sup>®</sup> pedicle screw system from L3 to S2AI and S2AI fusion with SI Bone bedrock implanted bilaterally. The goal of the surgery was to restore sagittal balance, stabilization of lumbar spondylosis, and achieve decompression for her severe lumbar spinal stenosis.

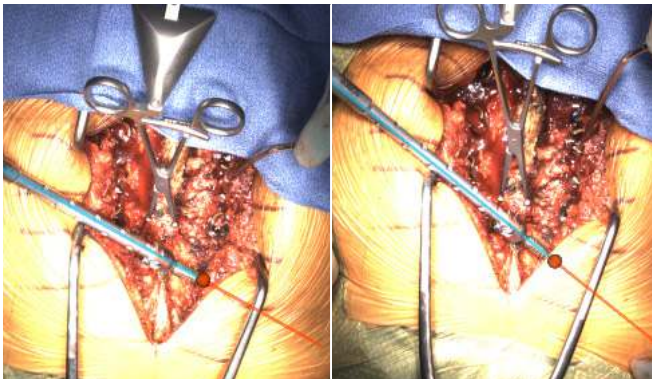
A preoperative CT was acquired and loaded onto the FLASH<sup>™</sup> Navigation system. Dr. Orndorff registered segmentally to L3, L4, L5, S1 and S2AI. To do this, he selected three points across each of the different levels of interest. After exposure, Dr. Orndorff initiated the FLASH Registration process which creates a 3D digitization of the patient's anatomy. To co-register the FLASH image with the preoperative image, Dr. Orndorff selected approximately the same three points across the level of interest. Registration was performed and Dr. Orndorff confirmed the accuracy by touching off on different bony landmarks. The workflow to register to the S2AI took 35.3s with the FLASH Navigation system registering a total of 1,487 points in 3.5s



Intraoperative images that demonstrate the surgeon's sterile point picking on the preoperative CT and the FLASH™ image on the S2A1.

### FLASH Trajectory

When using the navigated probe, Dr. Orndorff leveraged the virtual k-wire feature that is created from augmented reality. Once the correct trajectory was determined using a navigated instrument, the camera views were changed to the live video where a virtual k-wire is presented in blue (outside the anatomy) and orange (inside the anatomy).



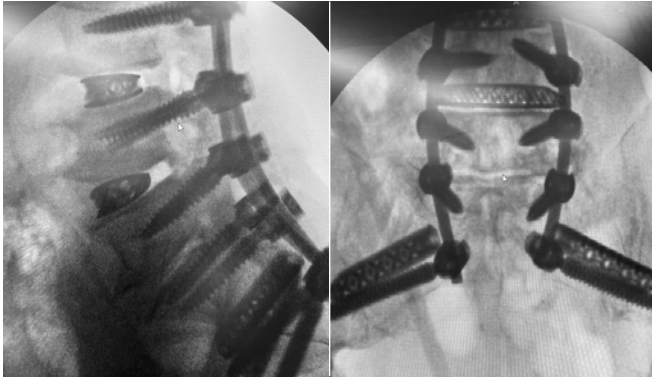
Live camera images showing utilization of FLASH Trajectory.



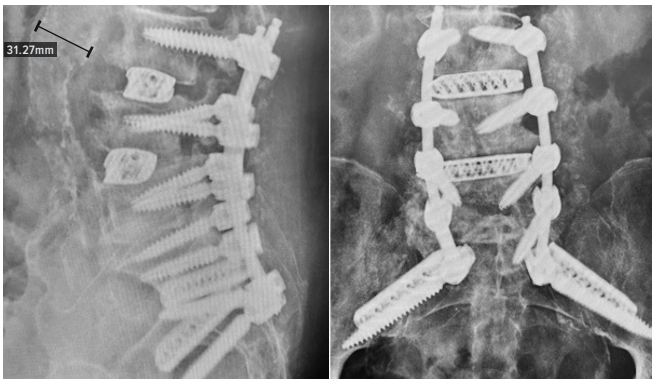
Different navigation views were utilized when navigating S1 and S2A1.

### Clinical Outcome

Immediately post-operatively, the patient was able to mobilize. She had significant improvement of her neurogenic claudication allowing for her to achieve a one-mile walk 2-days post-operative. At the 3-month follow-up appointment, she continued to make significant gains and improvements in her mobility and fitness.



Final fluoroscopy images at the end of the case.



3 month postoperative x-rays.

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