FLASH™ Navigation with 7D Technology

CASE STUDY | Minimally Invasive Cortical Screw Placement

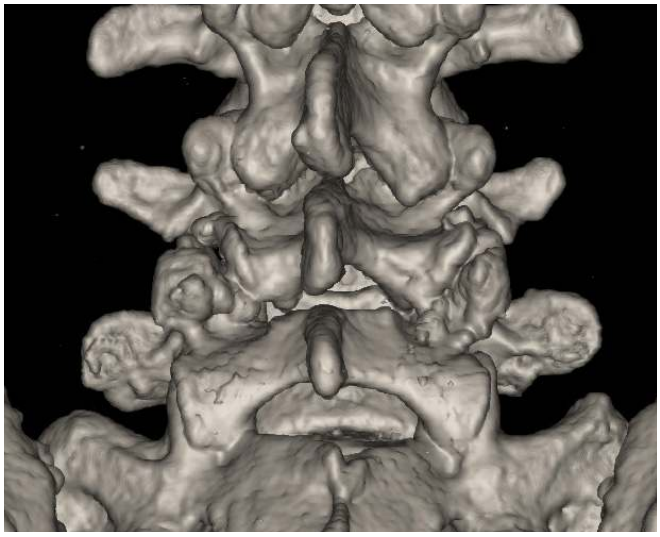
Surgeon Profile

SURGEON
Matthew Philips, MD
Neurosurgeon

LOCATION
St. Luke's Hospital
New Bedford, MA, USA

Case Highlights

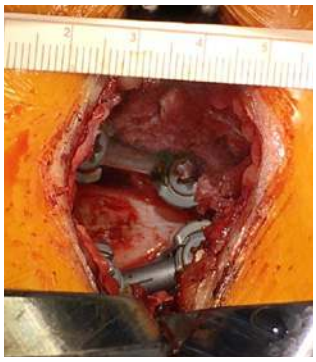
- 3.5cm mini-open incision
- Average registration workflow time of 20 sec.
- 372 points registered in 0.99 sec.
- Estimated reduction in radiation exposure of 85–94%
- Time savings of 2–5 min per level in comparison to fluoroscopy-guided screw placement



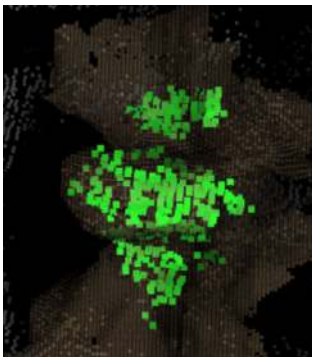
Reconstruction of the preoperative CT as displayed on the FLASH Navigation System.

Clinical Presentation

A 43 yo female presents with a history of worsening low back pain with pain radiating into the bilateral buttocks and legs. Her symptoms were exacerbated by walking and relieved by sitting. An MRI and flexion and extension X-rays revealed stenosis, grade two spondylolisthesis and hyper mobility at L4–L5. A decision was made to perform a minimal open lumbar fusion using cortical bone trajectory screws.



Surgical site showing minimally invasive 3.5cm incision.



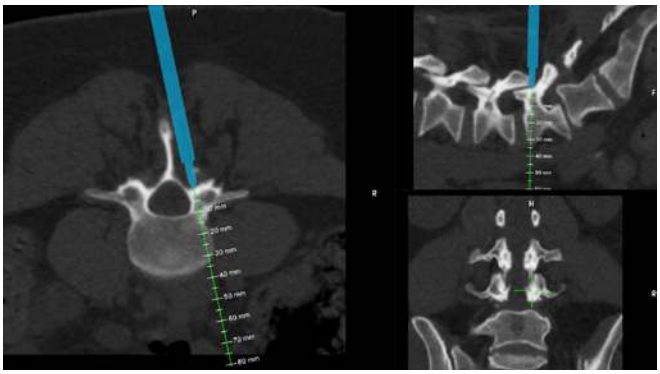
The 372 points used for registration are shown in green.

Surgical Procedure

A minimally invasive 3.5 cm incision was made to expose L4 and L5, as shown above. Three points were identified on the preoperative CT and the intraoperative surface was digitized with FLASH™ Registration by pressing the surgeon-controlled Foot Pedal. The 3 points were then collected on the patient's anatomy with the Navigated Awl. The FLASH Navigation System automatically registered 372 unique points from the preoperative CT to the intraoperative surface digitization with a processing time of less than one second. The entire workflow from digitizing the patient's anatomy to completing an accurate registration took 20 seconds.

FLASH™ Fix

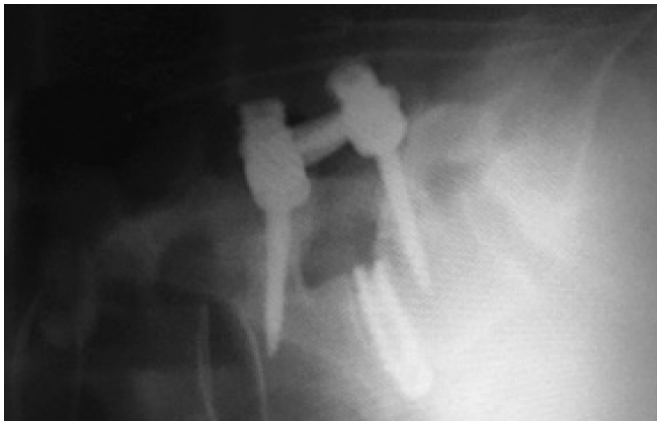
The Reference Frame was bumped while Dr. Philips was cannulating the pedicle. FLASH Fix was initiated to recover the registration in less than one second and registration accuracy was restored using only visible light and zero radiation. This case highlights the versatility and minimally invasive capability of the FLASH Navigation System, with four screws navigated in a 3.5cm incision.



Navigation views as displayed on the FLASH Navigation System.

Clinical Outcome

With great improvement of her preoperative symptoms, this patient has done extremely well postoperatively. She was back to her normal level of function within six weeks of surgery.



Postoperative X-ray showing screws in L4 and L5 pedicles.

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