

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

CASE STUDY | Pediatric Scoliosis Posterior Fusion with Machine-Vision IGS



### Surgeon Profile(s)

**SURGEON**  
Christopher Comstock, MD

**LOCATION**  
Driscoll Children's Hospital  
Corpus Christi, TX, USA



**SURGEON**  
Eric Wait, MD

**LOCATION**  
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### Surgical Procedure

Prior to the procedure, the patient's preoperative CT was segmented using the FLASH Navigation System's software. Points were selected from T1–S1 to automatically generate anatomical regions where FLASH Registrations, a proprietary algorithm utilizing 7D machine-vision technology, would occur. Dr. Comstock exposed the patient's T1-sacrum, sterilely positioned the cameras in the FLASH Navigation Light Head and initiated the FLASH Registration process via the surgeon-controlled Foot Pedal. Using the 7D Probe, Dr. Comstock then selected points on the patient's anatomy similar to those defined on the preoperative CT. The system processed the FLASH Registration to T9–T10 in 6.8 seconds, while colocalizing 4,958 points between the digitized surface and preoperative CT scan. The pelvic screws were positioned for an S2AI trajectory, although the patient had caudal regression and abnormal anatomy. A total of 21 screws were successfully placed using the FLASH Navigation System with zero radiation.

### FLASH Fix

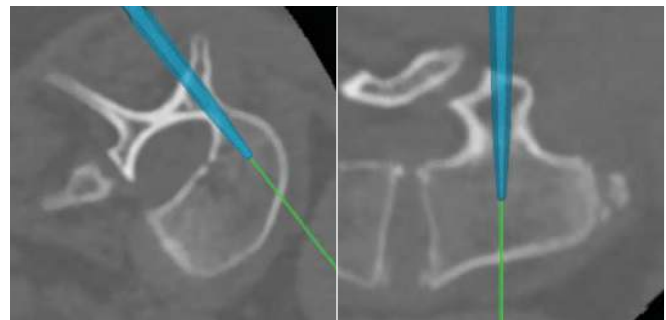
After instrumenting the left S2AI screw, the 7D Reference Frame was intentionally repositioned to accommodate the right S2AI screw trajectory. FLASH Fix was used to simultaneously digitize the patient and correct the registration instantly to allow Dr. Comstock to continue operating. This registration correction took 5.1 seconds without the need for any intraoperative ionizing radiation.

### Case Highlights

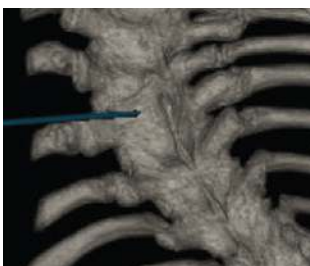
- 21 screws guided
- Registrations performed
  - Average registration workflow time: 53.57 sec.
  - Average FLASH<sup>™</sup> processing time: 5.49 sec.
  - Average points registered: 2,562

### Clinical Presentation

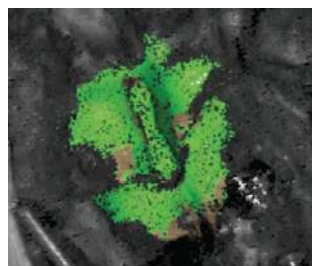
An 11 yo female presented with a history of Bilateral Severe Proximal Femoral Focal Deficiency (PFFD) and caudal regression with progressive scoliosis and pelvic obliquity. Her family noted progressive decompensation in her chair. Imaging revealed a large left thoracic right lumbar scoliosis with congenital fusions in the thoracic spine, severe lumbar rotation, and segmental sacral defects.



Navigation views as displayed on the FLASH Navigation System.



3D image of spine during level definition, as shown on the FLASH Navigation System.



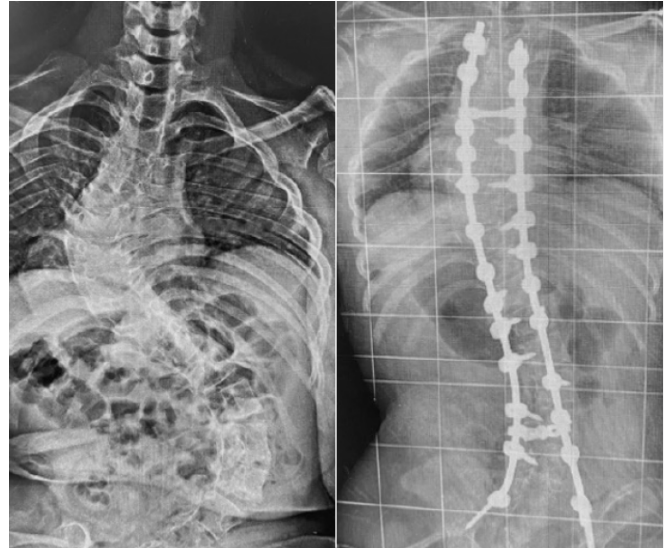
The 4,958 points used for registration are shown in green.

### Clinical Outcome

Sacral segmentation defects, severe lumbar rotation and thoracic congenital deformities made placement of pelvic screws and spinal pedicle screws challenging but the navigation worked flawlessly, and all screws were successfully placed without complications.

*“The result is excellent given the congenital fusions. The pelvic screws look perfect. Her chest and collapsed ribs opened up very nicely. I think the family will be very happy.”*

**Dr. Christopher Comstock**  
Driscoll Children’s Hospital



Pre and postoperative X-ray showing correction achieved with 21 screws implanted using the FLASH<sup>™</sup> Navigation System.

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