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New Technology for an Old Problem: Ultrasound-Assisted Spinal Anesthesia in a Parturient with History of Scoliosis Spine Surgery

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Parturients with corrected or uncorrected scoliosis pose a challenge to obstetric anesthesiologists. Ultrasound-assisted neuraxial anesthesia has aided performance of neuraxial anesthesia for patients with altered spinal anatomy. We report a case for which we used a handheld ultrasound (US) to identify the interlaminar space of a parturient with surgically corrected scoliosis.

A 21-year-old female G2P0100 at 19 weeks gestational age presented for cerclage placement. Physical examination revealed a patient with a Mallampati 2 airway, BMI 30.8 kg/m², and a thoracolumbar spine scar. Her past medical history indicated severe scoliosis requiring surgery, but no imaging was available. In the sitting position, using a handheld US (Accuro, Rivanna Medical), the L3-L5 levels were identified using a paramedian oblique scan. The L3-L4 and L4-5 levels were then assessed using a transverse scan to determine the best lumbar interspaces for a spinal technique (Image 1). The sonoanatomy suggested L4-L5 to be the interspace with the most preserved anatomy. US-assisted findings identified the optimal intervertebral space to be significantly lateral to where midline appeared to the naked eye. Spinal anesthesia was performed under sterile conditions, and only one needle manipulation after the initial placement was necessary to obtain cerebrospinal fluid. The patient received Bupivacaine 0.75% 1.3 ml and 15 mcg of Fentanyl, and surgical level was obtained within 10 minutes. The cerclage was completed successfully.

Preprocedural US imaging has been shown to ease spinal anesthesia performance in nonobstetric and obstetric patients with spine surgeries(1,2). The Accuro US system may further facilitate neuraxial anesthesia placement due to its feature recognition software that automates midline and the epidural depth measurement. A particular limitation of typical US technology is its heavy dependence on sonographer skills and image interpretation. The Accuro system provides a 3D reconstruction of the spine, facilitating both obtaining and interpreting the images. Given our past experience with patients exhibiting severe scoliosis, we expect that this patient may have experienced an increased number of needle insertions, extended procedure time, and a potentially heightened risk of complications had we elected to not use US(2).

References:

1. Chin K, et al. Anesthesiology. 2011.
2. Perlas A, et al. Reg Anesth and Pain Med. 2015.

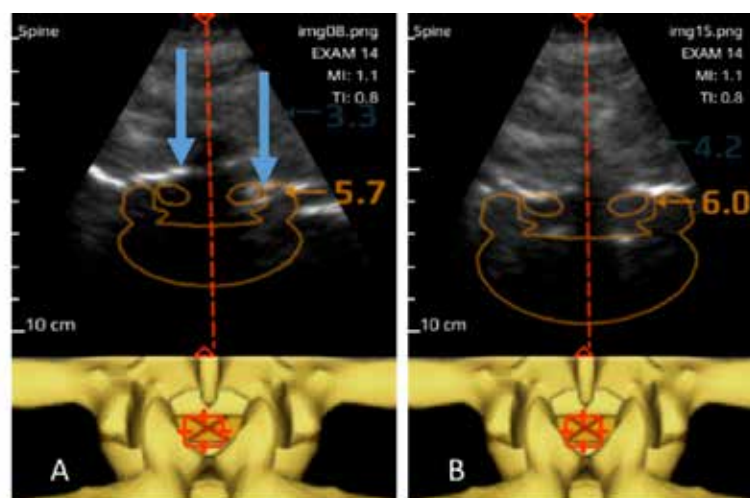


Image 1) Intervertebral space located using SpineNav3D™ and BoneEnhance™ technology. **1A.** L3-L4 intervertebral space. Uneven articular processes which is characteristic of scoliosis are evident- blue arrow. **1B.** L4-L5 intervertebral space. Spine anatomy was better defined at this intervertebral space.