

Ultrasound guidance for interventional pain procedures: Neuraxial structures

Ultrasonography (US) has multiple advantages over other modalities [anatomic landmarks (AL), nerve stimulation, and fluoroscopy (FL)] for guiding procedures to relieve chronic pain. Unlike FL, US does not require ionizing radiation and use of contrast dye. Although limited in its ability to see past bones, US helps visualize soft tissues and vascular structures in anatomic regions of interest. These unique advantages have resulted in its increasing use for neuraxial structures with scientific publications on this topic from all over the world over the last decade.

Guidance with US for procedures performed frequently to relieve pain has the potential to enhance accuracy, efficacy, and safety. Visualization of neurovascular and musculoskeletal structures with US enables the interventionist to target structures of interest while minimizing complications. A paucity of high quality RCTs to confirm advantages of US over traditional modalities (AL, nerve stimulation, and FL) and a perception that experience of the interventionist affects procedural performance with US guidance are significant barriers to widespread use of US for interventional pain. Further, studies that demonstrate the potential of US in increasing accuracy of interventional procedures need to be replicated in patients. Current evidence is stronger for using ultrasound to guide joint and peripheral nerve as compared to neuraxial procedures. Studies that combine use of ultrasound (to enhance safety through visualization of vessels prior to insertion of needles) and fluoroscopy (to allow simultaneous visualization of multiple spinal levels) may improve outcomes of neuraxial procedures.

The objective of this brief review is to review technique and discuss important recent publications on the use of US in interventional pain medicine for neuraxial structures.