Use of Ultrasound in Lumbar Punctures and Intrathecal Drug Administration

Mark Guttman MD, FRCPC
Centre for Movement Disorders
Toronto, Canada
Speaker Disclosure

Mark Guttman
Neurologist
Centre for Movement Disorders
Toronto, Ontario Canada

Disclosures:
Advisory Boards for Roche, Novartis, PTC Therapeutics
Consultant for CHDI and Roche
Spinal Ultrasound

• Safe, portable imaging method to identify anatomical landmarks for lumbar puncture (LP) and intrathecal (IT) drug administration
• Traditional LP methods do not provide precise anatomical localization
• Spinal ultrasound will provide exact anatomical information to determine the L3/4 interspace
• Depth measurement from skin to the thecal sac can be measured accurately
• The procedure adds about 5 minutes to LP/IT
• Improves the morbidity of the procedure
Ultrasound-Facilitated Epidurals and Spinals in Obstetrics

Jose Carlos Almeida Carvalho, MD, PhD, FANZCA, FRCPC

Department of Anesthesia and Pain Management, Mount Sinai Hospital, 600 University Avenue, Room 781, Toronto, Ontario, M5G 1X5, Canada
Spinal Ultrasound Methods

• Performed before patient has sterile prep either in sitting or left lateral decubitus position
• Initial ultrasound is performed in the paramedian plane to first identify the sacrum and then identify the sequential lumbar vertebrae to localize the L3/4 interspace
• The L3/4 interspace is marked with a pen
• The second ultrasound is performed in the transverse plane
• The image is frozen and measurement obtained to calculate the depth from skin to anterior dura
• http://pie.med.utoronto.ca/VSpine/index.htm
Paramedian Scan
Paramedian Scan-moving cephalad
Transverse Scan
Marking the Skin
Transverse Scan – Depth Measurement
**Paramedian Ultrasound**

**Paramedian Scan**

A paramedian longitudinal scan is used to count to an appropriate interspace and is done instead of using the iliac crest to estimate the L3-L4 interspace since it is much more accurate. The probe is positioned over the lamina and angled slightly towards the midline. Proper positioning is achieved when the following structures can be seen:

- Sacrum (flow down on the spine)
- Lamina
- Ligamentum Flavum/Dura
- Posterior Longitudinal Ligament/Posterior Edge of Vertebral Body

Click on the highlighted structures in the text above to identify them.
Transverse Ultrasound

Transverse scan
The main goal to performing a transverse ultrasound scan is to be able to identify an appropriate interspace. In order to interpret when you are in an interspace, it is first important to be able to identify when you are not in an interspace. The following anatomical structures can be seen outside of the interspace:

- Spinous process
- Lamina

Click on the highlighted structures in the text above to identify them in the ultrasound image. Slide the probe up and down to view these structures at different interspaces.

A vertebral interspace is usually characterised by being able to
Patient Paramedian and Transverse
Ultrasound
Thank you