Pro/Con Debate: Lumber Ultrasound - Useful Gadget or Time Consuming Gimmick

Pro

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Objectives: After attending this presentation, participants will understand the advantages of using spinal ultrasound to facilitate the placement of spinals and epidurals, the principles of lumbar spinal ultrasound assessment, and the resources required for successful implementation of this technology.

Summary: The practice of epidurals and spinals in Obstetrics relies on the palpation of anatomical landmarks that are not always easy to feel. A good assessment of the spine includes a careful examination to determine if the vertebrae are aligned, and to locate the iliac crests, the lumbar spinous processes and the interspaces. These landmarks are required to perform a safe lumbar puncture because they identify the level of the spine and optimal site where the puncture should be performed; however, they are often inaccurate, especially in regard to the identification of the level of the spine. Other important aspects of the epidural/spinal technique, such as the angle of puncture and the distance from the skin to the ligamentum flavum, cannot be assessed based on inspection and palpation. If a patient is overweight or has scoliosis, the appropriate assessment of the lumbar spine becomes even more challenging, increasing the changes of failure and/or complications of the spinal or epidural anesthesia placement.

Complications of spinal and epidural anesthesia include patient discomfort, trauma to various structures such as the spinal cord, nerve roots, vessels, ligaments and bones, and accidental dural punctures with subsequent postdural puncture headaches. Traditionally, these complications have been minimized by the meticulous assessment of the landmarks, optimal positioning of the patient and refinement of the technique. Now, with the availability of bedside ultrasound, we can “see” more of the anatomical structures, and our technique has become much less blind. Perhaps it is appropriate to say that the “art” is giving way to the technology.

There are two acoustic windows that are effective for lumbar spine sonographic assessment: one seen on the transverse approach, and the other seen on the longitudinal paramedian approach. The information from each of these two scanning planes augments the other. Ultrasound of the lumbar spine is useful to identify not only normal spinal anatomy, but also abnormal anatomy such as that associated with obesity and scoliosis.

Bedside ultrasound can be extremely useful to facilitate spinal and epidural anesthesia placement by providing the following information:

a) the exact interspace at which the puncture should be performed;
b) the best interspace;
c) the ideal insertion point;
d) the angle of the puncture;
e) the distance from the skin to the epidural space; and
f) anatomical abnormalities, such as scoliosis.

Some of the advantages of ultrasound, both proven and yet to be proven, include:

a) it is a superior teaching tool for spinals and epidurals, as it facilitates the learning curve, and may increase safety during the learning curve;
b) it shortens the duration of the procedure;
c) it increases the comfort of the procedure;
d) it decreases the number of attempts, and the associated trauma;
e) it may decrease the number of accidental dural punctures;
f) it forecasts difficult epidurals;
g) it transforms difficult epidurals into easy epidurals;
f) it helps in the selection of the best equipment for the spinal/epidural.

References: