The Use of Ultrasound to Measure the Depth of Thoracic Epidural Space

Issam Khayata
University of Massachusetts Medical School

Let us know how access to this document benefits you.
Follow this and additional works at: https://escholarship.umassmed.edu/anesthesiology_pubs

Repository Citation
The use of ultrasound to aid in regional blocks has increased in recent years as a result of improvement in ultrasound technology. There have been many studies to evaluate the use of ultrasound to measure the depth of the epidural space in the lumbar region. Studies have shown a strong correlation between the depth of the epidural space measured by ultrasound and the distance of the needle from the skin after establishing the loss of resistance in the epidural space.

This study looked at the epidural space in the thoracic space to evaluate the possibility to visualize the thoracic spine anatomy and the possibility to measure the depth of the epidural space and its correlation with the actual depth by the loss of resistance technique. This study was also designed to assess the ability of the ultrasound to define the best needle insertion point and limit the number of needle skin puncture attempts.

**METHODS**

After approval of the IRB at the UMass Medical School and written consent was obtained, 29 patients were enrolled in the study. Exclusion criteria included pregnancy, prisoners, and patients with an absolute contra-indication to thoracic epidural. The use of ultrasound was able to identify the depth of the thoracic epidural space in 24/29 cases (83%) of the patients. The catheter was considered at least partially functioning in 26/29 patients (20 functioning, 6 partially functioning (89.65%).

**RESULTS**

Mean ultrasound distance (UD) values were 4.22 cm ± 0.82 and actual distance (AD) values were 5.59 cm ± 1.29 with Pearson’s correlation coefficient between AD and ultrasound longitudinal (USL) and ultrasound short axis (USS) values were 0.637 and 0.566 respectively. The mean number of attempts were 1.96 ± 1. The number of attempts were defined as the number of skin puncture points by a single provider or the number of providers attempting in the same insertion point. The use of ultrasound was able to identify the depth of the thoracic epidural space in 24/29 cases (83%) of the cases.

**CONCLUSION**

Ultrasound scanning can be used to measure the depth of the thoracic epidural space with good correlation.

**REFERENCES**


**INTRODUCTION**

The use of ultrasound to measure the depth of the epidural space in the lumbar region. There have been many studies to evaluate the use of ultrasound to measure the depth of the epidural space and it's correlation with the actual depth of the epidural space and its correlation with the actual depth by the loss of resistance technique. This study was also designed to assess the ability of the ultrasound to define the best needle insertion point and limit the number of needle skin puncture attempts.

**RESULTS**

Mean ultrasound distance (UD) values were 4.22 cm ± 0.82 and actual distance (AD) values were 5.59 cm ± 1.29 with Pearson’s correlation coefficient between AD and ultrasound longitudinal (USL) and ultrasound short axis (USS) values were 0.637 and 0.566 respectively. The mean number of attempts were 1.96 ± 1. The number of attempts were defined as the number of skin puncture points by a single provider or the number of providers attempting in the same insertion point. The use of ultrasound was able to identify the depth of the thoracic epidural space in 24/29 cases (83%) of the cases. The catheter was considered at least partially functioning in 26/29 patients (20 functioning, 6 partially functioning (89.65%)).

**CONCLUSION**

Ultrasound scanning can be used to measure the depth of the thoracic epidural space with good correlation.

**REFERENCES**