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CORRESPONDENCE

Methodological considerations of ultrasound-guided spinal anesthesia using the Ultrasonix GPS™ needle tracking system

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To the Editor,

We read with interest the recent case report[1] on ultrasound-guided spinal anesthesia with the Ultrasonix GPS needle tracking system. Based on our recent experience with this technique, we suggest that this report merits further discussion on certain methodological considerations.[2]

We recently described our preliminary experience with this system on spinal anesthesia in two cadavers in the prone position,[2] and we have subsequently used the technique in several patients in the sitting position. In our cadaver study, a 2-5 MHz convex transducer was used in a parasagittal oblique plane. A 19G SonixGPS™ needle was inserted out-of-plane using the needle guidance technology and coloured dye was injected. The spinal needles were left *in situ*, and 16 injections between T2/3 and L4/5 were completed. All 16 attempts required only a single skin puncture. An anatomist carried out a post-procedural dissection, revealing successful needle and dye placement in the neuraxial space in 100% of attempts.[2]

In the case report by Wong *et al.*, it is unclear which needle trajectory was employed relative to the ultrasound plane. Based on their Fig. 2, it appears that they utilized an in-plane approach directed cephalad. The position of the needle relative to the probe is indicated at the bottom right of the screen shot. For our cadaver study,[2] we used both in-plane and out-of-plane approaches with the SonixGPS system. We found that the in-plane approach was technically difficult because of the size of the transducer head, the acute angle required, and the narrow interlaminar space. This approach also increased the skin-to-target distance travelled by the needle. The approach facilitating easiest access to the neuraxial space without encountering the lamina was the medially angled paramedian view with the needle entering out-of-plane at the medial aspect of the transducer (Figure).

Needle tracking using the SonixGPS system with an in-plane approach helps to align the needle with the transducer and to identify the position of the needle shaft and tip. Nevertheless, the needle entry point is confined to the midline on either the caudal or cephalad edge of the transducer. Due to the length of the curvilinear probe, an in-plane approach greatly increases the required needle length to reach the subarachnoid space. An out-of-plane approach, however, maximizes the benefit of a needle tracking system. The system extrapolates where the needle tip will intersect the ultrasound plane based on the needle trajectory. This allows for unlimited needle entry starting points along the long edge of the transducer with a shorter distance to the dura and, in the case of neuraxial blocks, helps avoid laminae. The needle trajectory does not need to line up with the plane of the ultrasound beam and, therefore, this constraint is eliminated.

Based on our experience with real-time ultrasound-guided neuraxial techniques using the SonixGPS in the prone[2] and sitting positions, we also consider the sitting position to be more familiar and more ergonomic for the anesthesiologist.

We agree with the authors that the SonixGPS system is a technological advance that may be helpful with difficult spinal anesthetics and needs further evaluation in the clinical setting.

Editor's Note: The authors of the article: Can J Anesth 2012; DOI: 10.1007/s12630-012-9809-2 respectfully declined an invitation to submit a reply to the above Letter to the Editor.

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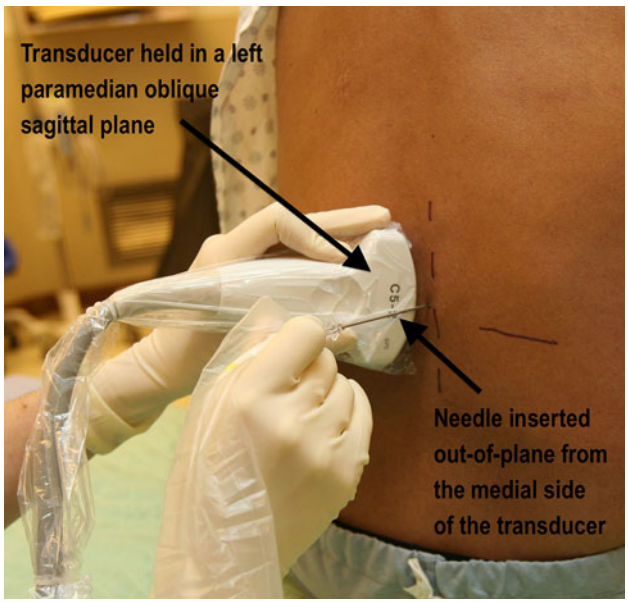

Figure 1 Image showing orientation of the ultrasound transducer and needle in a simulated patient

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Conflicts of interest None declared.

References

1. *Wong SW*, *Niazi AU*, *Chin KJ*, *Chan VW*. Real-time ultrasound-guided spinal anesthesia using the SonixGPS® needle tracking system: a case report. Can J Anesth 2012; DOI:10.1007/s12630-012-9809-2.
2. *Brinkmann S*, *Tang R*, *Vaghadia H*, *Sawka A*. Assessment of a real-time ultrasound-guided spinal technique using SonixGPS™ in human cadavers. Can J Anesth 2012; DOI:10.1007/s12630-012-9792-7.