



Case Report Supports Use of Ultrasound Needle Guidance System

Popliteal Catheter Placement Utilizing Ultrasound Needle Guidance System

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Summary and Methods

To overcome two of the most significant barriers in providing a safe and efficient ultrasound-guided nerve block, a clinician must keep the needle in the image plane and avoid unintentional probe movement while advancing the catheter. This case highlights the use of a needle guidance system, Ultra-Pro II™, to facilitate overcoming barriers using a single operator, in-plane approach.

The patient was positioned prone and the sciatic nerve was identified utilizing a linear probe, 8cm superior to the popliteal crease. The ultrasound system biopsy guidance software was used to calculate the distance the needle must travel to the nerve. The software highlighted the planned needle trajectory with a superimposed guideline on the ultrasound image which allowed for pre-planning of the needle path. The patient was prepped, draped and the transducer and needle guide bracket were covered with a sterile sheath.

The needle guide was attached to the probe using sterile technique. An insulated needle was advanced and positioned under real-time in-plane guidance and nerve stimulation. A catheter was fed through the needle during continuous needle visualization. Local anesthesia was then administered and visualized as a hypoechoic ring surrounding the nerve. The catheter was secured and the patient re-positioned supine. A single injection femoral nerve block was performed. Testing confirmed absence of sensation in the femoral and sciatic distributions as well as leg extension, plantar and dorsal flexion within ten minutes of the femoral block completion.

Discussion and Results

Difficulties in performing an ultrasound-guided nerve block include clinical expertise of the practitioner, maintaining the imaging scan plane and needle alignment to visualize the tip during the procedure. Although each probe must have its own custom needle guide, this additional component allows the imaging and needle delivery system to become one unit. Instead of requiring a third hand, a single practitioner can image, control the needle path and deploy the catheter with ease. Needle guides can secure the needle track in line with the ultrasound beam from pathway planning to catheter deployment.

Conclusions

The authors cited limitations associated with the guidance system including; ability to make only minor adjustments once the trajectory was established, accuracy of the image and needle track must be established prior to cutaneous puncture and limited trajectories are available in the ultrasound system software.

The study's findings suggest the Ultra-Pro II needle guide:

- improved needle visualization within the tissue, helped increase patient safety
- increased time efficiency resulted improved needle tip visualization.

Author Commentary

"US guidance allows the visualization of catheter advancement and its relationship to the nerve."

"The role of US in peripheral nerve blocks continues to evolve rapidly, but in each case, success and safety partly depends on needle tip identification within tissue. The needle guidance systems are one way to improve that visibility; especially with novice clinicians."

"We have performed over 20 successful popliteal nerve catheters using the US needle guidance system. We found it easy to use; the needle tracking was precise and the target depth was accurate."

