FIRST HAND EXPERIENCE

An interview with Dr. Paul Bigeleisen

Finding the Nerve: Mobile Ultrasound in Anesthesiology

Dr. Paul Bigeleisen, clinical associate professor of Anesthesiology at the University of Rochester Medical Center (URMC), has seen many advances in the anesthesiology field during his 20 years in practice. He is part of a growing group of anesthesiologists that use advances in ultrasound technology to pinpoint needle placement and identify the spread of local anesthetic, in what is known as regional anesthesia. Supported by hand-carried ultrasound, regional anesthesia has helped speed patient recovery and enabled doctors to perform surgeries on patients who in the past had been excluded from surgery. One regional anesthetic procedure that has benefited from hand-carried ultrasound has been the application of nerve blocks.

Ultrasound in Anesthesiology

According to Dr. Bigeleisen, hand-carried ultrasound technology has changed the application of anesthesia in nerve block procedures. With the guided nerve block technique, an anesthesiologist can more precisely insert a needle by actually visualizing the vein, artery and nerve, and administering analgesia around the site of interest.

"Nerve blocks are a good example of a regional anesthesia procedure. Having ultrasound available at the point of care while administering anesthesia has been the key in these types of cases," said Dr. Bigeleisen. "The ultrasound-guided technique allows us to use less analgesia, diminishes complications, and helps us avoid stimulating nerves that could cause additional pain or discomfort in the patient."

When Dr. Bigeleisen began to practice medicine, the standard for performing a nerve block was simple: feel for surface landmarks and insert a needle. As a result, physicians could miss and be required to reinsert the needle, or accidentally hit the nerve causing the patient pain and discomfort. Without an ultrasound-guided technique, the patient can experience more pain.

"Every patient before any surgery is nervous, so I like to be quick and efficient with little or no pain to the patient," he said. "I recently performed a nerve block on a 4-year-old, and the parents were amazed at how quickly I inserted the needle; the child experienced little discomfort."

Dr. Bigeleisen has been instrumental in bringing the use of ultrasound into the anesthesiology department at URMC. About 12 years ago, he began looking for ways to improve the application of nerve blocks. He wanted a new type of ultrasound that would allow him to scan patients at the point of care and give him a view of the nerve. Today, he believes that the improved image quality and increased mobility of ultrasound technology has accelerated its use in anesthesia.

"The availability of hand-carried ultrasound technology has marked an increase in the number of nerve blocks performed for arm, leg and knee surgeries," he said. "The large ultrasound machines could, in fact, image nerves, but they were impractical for clinical or point of care use."

A Rugged, Cutting-Edge Technology

In 2001, Dr. Bigeleisen heard about Dr. Nav Parkash Sandhu of New York University performing nerve blocks with the use of high-performance hand-carried ultrasound technology manufactured by SonoSite, Inc. (Bothell, Wash.).

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Dr. Bigeleisen was looking for an ultrasound device that would meet his needs, and he invited Dr. Sandhu to come to Rochester to provide a demo on how hand-carried ultrasound could be used for nerve blocks. During the visit, Dr. Sandhu performed a nerve block on Dr. Bigeleisen using hand-carried ultrasound. From that point on, Dr. Bigeleisen has been an advocate of ultrasound use in anesthesiology.

In November 2003, URMC purchased a TITAN system, the second generation of hand-carried ultrasound from SonoSite. Dr. Bigeleisen believes that the size and mobility of the ultrasound device is ideal for use in anesthesia. The TITAN system allows him to transport the technology between practice locations, set it up in any convenient space, and plug it into his laptop to download images.

"Since we purchased the TITAN system, URMC has made ultrasound-guided

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regional anesthesia a preferred procedure," he said. "the TITAN system allows us to find the nerve without causing damage to it from guessing where to guide the needle. It makes a big difference."

With a rise in obesity nationwide, the use of ultrasound to guide nerve blocks has become an increasingly useful tool. Dr. Bigeleisen has seen a steady increase over the last decade in the size and weight of many of his patients. Since it is virtually impossible to locate surface landmarks on such patients due to the increased mass that cover the normal marks, he prefers to use the TITAN in nerve block procedures.

"The ability to perform quick, comfortable procedures on overweight patients was one of the primary reasons we got the TITAN system," he said. "Without ultrasound, weight-challenged patients could be subject to a hit or miss needle search. The ultrasound-guided technique is a five minute procedure where the anesthetic is localized."

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Vital Everyday

As the staff at URMC becomes more comfortable with using hand-carried ultrasound in nerve blocks, Dr. Bigeleisen is beginning to use it for other procedures, such as catheter placement. He also uses the technology on cases involving children in the pediatric ward at Strong Hospital. Today, Dr. Bigeleisen sees the use of hand-carried ultrasound as a state-of-the-art "must have" in the practice of anesthesiology, which one day could become the standard of care. He feels that few doctors truly understand the full capacity of how ultrasound can impact anesthesiology.

"It's a learning process," he points out. "But I am convinced that at the end of the day it will prove to be a tool that all anesthesiologists use everyday."

University of Rochester Medical Center

The University of Rochester Medical Center is at the heart of medical knowledge and expertise for Central New York State and the Finger Lakes region of Upstate New York. It includes the University of Rochester School Of Medicine and Dentistry, the School of Nursing, the Eastman Dental Center, the University of Rochester Medical Faculty Group, Strong Memorial Hospital and the Children's Hospital at Strong. Dr. Bigeleisen practices as a member of Strong Health, the group that staffs the University of Rochester Medical Center, and his time is split between three facilities: Strong Hospital, Highland Hospital, and the Lattimore Surgicenter.

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