

Editorial

Ultrasonography in Anesthesia – Current Standards and Trends

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Use of ultrasonography in Anesthesiology & Critical Care has evolved over the last decade and has been the most happening addition to this speciality. The spectrum of ultrasonography is still enhancing rapidly with the field of pain management also not remaining untouched by its widespread applications.

Today, in most of the conferences, panels, CME's and scientific publications, sonography has established a permanent stature by its remarkable presence on all these forums. Social media sites such as you tube are serving as new teachers for video graphic demonstration of ultrasound guided procedures, that have been posted by universities of international repute and equipment supplying companies to promote education, interest and insight for users and researchers.

Modern ultrasound machines are not only more compact and portable, have better resolution and enhanced tissue penetration, thus making it a handy tool for identification and desired intervention in various body structures.

Ultrasonography is becoming an important tool for anesthesiologists, pain specialists and intensivists and is playing a vital role in central venous access, regional anesthesia for nerve blocks, cardio-pulmonary examination in critical care units, rapid examination of abdominal organs in emergency and trauma care units, and as a tool for evaluation peri-operative cardiac function via trans-oesophageal or trans-thoracic routes.

In intensive care settings, motion mode ultrasonography has shown promising results in screening out patients at high probability of difficulty weaning from ventilatory support. It allows electronic capture of structures lying cephalad and caudad with respect to diaphragm. Assessment of diaphragmatic excursion by calculating hepatic or splenic downward displacements during spontaneous breathing trials, diaphragm motion and diaphragm thickening fraction by ultrasound have emerged as novel techniques.

Trans-oesophageal echocardiography has been used peri-operatively during anesthesia to diagnose ongoing ischemia by detecting fresh regional wall motion abnormalities in patients with ischemic heart disease. It also serves as a sensitive tool for early detection of pulmonary embolism and evaluation of left and right ventricular function, and volume status in patients with severe haemodynamic instability.

Ultrasound guided nerve block is now becoming the standard practice in regional anesthesia and has been

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shown to require less volume of local anesthetic and reduce the incidence of complications.

In pain management, the use of ultrasound has been shown to have 100% accuracy in locating the caudal space and guiding epidural needles for caudal injections for low back pain.

In emergent situations, vascular access and airway management are the key components of a successful resuscitation. Although used initially to facilitate central venous access, ultrasound is also being used more commonly to facilitate peripheral venous and arterial access. Ultrasound guidance not only reduces the number of attempts and time, but also the associated complications reported for landmark technique, including incorrect placement of catheters. Newer applications include the use of laryngeal ultrasound to detect patients at risk of post-extubation stridor, by evaluating peri-cuff airflow. It can also be utilized to assess subglottic diameter, to calculate appropriate endotracheal tube size.

Recently, interest has also evoked in localization and access to the depth of epidural and intrathecal spaces in cases of difficult lumbar canal anatomy or in otherwise high risk patients where neuroaxial procedures are warranted.

Use of ultrasound for facet joint injections, lumbar sympathetic blocks, celiac plexus blocks, stellate ganglion blocks and identification of myofascial trigger points has also been described in current literature, but their clinical utility is currently limited due to inadequate trial support, user experience and clinical outcomes.

As the ultrasound guidance is becoming standard practice of future, anesthesiologists need to develop a thorough understanding of this technology and practical skills by training themselves.

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