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6.1.4 Sterility

Sterile preparation of the probe and block area is a prerequisite for ultrasound-guided block techniques. Subspecialties such as interventional radiology have been using covered probes for many years in order to preserve sterility. Despite their extensive experience with ultrasound-guided interventions, an optimal cover has yet to be identified.

The expert statement paper published in 2007 (see Appendix 1 for a summary) recommends a sterile probe cover for single and continuous block techniques. Figure 6.15 shows the latest development in that field, where a transparent adhesive sheet is connected to a plastic foil. This unique arrangement of two different materials avoids getting jelly between the probe and the cover. Of course, (sterile) jelly between the probe cover and the skin is necessary. We have found that urinary catheter jelly can be used as an alternative to dedicated and more expensive sterile ultrasound products. Figures 6.16 to 6.19 illustrate how the sterile ultrasound probe cover should be used.

Figures 6.20 and 6.21 compare the histogram values of an ultrasound illustration (psoas major muscle of a pig, two different gain adjustments) of a 13MHz linear probe without probe cover, with a glove as probe cover and two jelly layers, and with a specific ultrasound probe cover with one jelly layer. The probe without cover provides the brightest image quality, whereas



Fig. 6.15 Sterile probe cover system with a transparent adhesive sheet (left side) which is connected to a plastic foil.

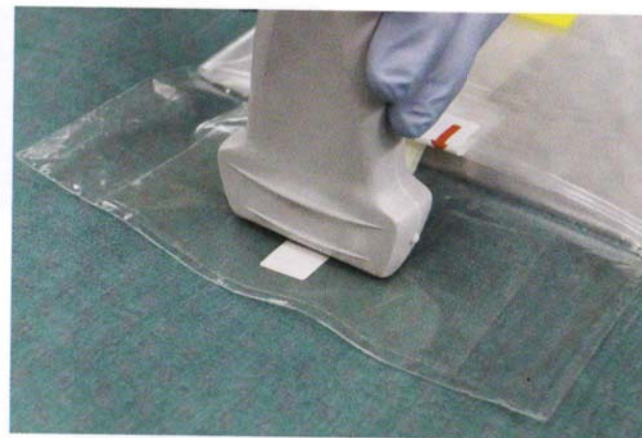


Fig. 6.16 Correct use of the sterile probe cover. The active area of this linear probe is placed on the adhesive part of the probe cover.

the images of the probe with the glove and the specific ultrasound probe cover appear slightly darker. Thus, the use of probe covers requires slight adjustments in gain to compensate for the loss of brightness (+4% 'glove cover' and +7% 'specific ultrasound probe cover' as compared with 'no probe cover').



Fig. 6.17 Correct use of the sterile probe cover. The probe is then covered all over by the plastic sheath.



Fig. 6.18 The ultrasound probe and the cable are covered in a sterile manner.

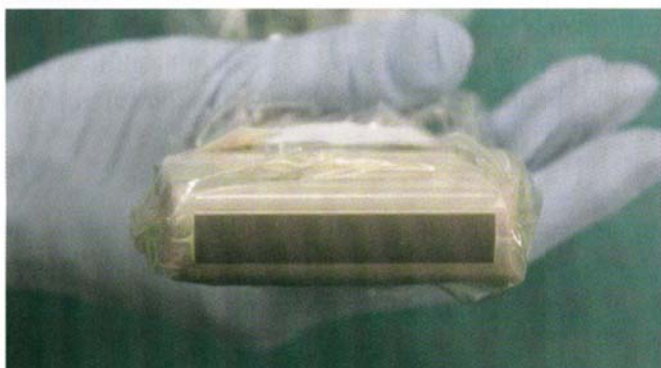


Fig. 6.19 The active area of the ultrasound probe with the sterile probe cover. It is important to avoid any creases in order to maintain optimal image quality which is easily possible with this system.



Fig. 6.20 Histogram values of a 13MHz linear probe without probe cover (left), with a glove as probe cover and two jelly layers (middle), and with a specific ultrasound probe cover with one jelly layer (right). The numbers indicate the specific histogram values from the entire screen shot (approx. 100,000 pixels for each screen shot).



Fig. 6.21 Histogram values of a 13MHz linear probe without probe cover (left), with a glove as probe cover and two jelly layers (middle), and with a specific ultrasound probe cover with one jelly layer (right). The numbers indicate the specific histogram values from the entire screen shot (approx. 100,000 pixels for each screen shot). Different gain adjustment as in Figure 6.20.

6.2 Organization

6.2.1 How to start?

Adequate education and training is necessary to achieve the courageous aim of successful ultrasound-guided regional blocks. All anaesthesia congresses provide basic workshops aiming at stimulating the interest of potential users of this technique. These very basic workshops should be followed by advanced and expert workshops. Anyway, the anaesthesia community is at a very early stage in the development of guidelines for a structured education. Chapter 4 provides a concept of appropriate training and education in ultrasound-guided regional anaesthesia.

Once the institution of an individual physician is willing to implement ultrasound guidance in their regional, clinical, anaesthetic practice, the following questions should be clearly answered:

- ◆ How was their own performance of regional anaesthesia in terms of overall success rates and complications in the past?
- ◆ Is there room for improvement when the technique of nerve guidance will be changed?
- ◆ What prerequisites should be considered when ultrasound guidance for regional blocks will be introduced?
- ◆ How can we monitor problems associated with the new technique?
- ◆ How can we review our daily clinical practice?
- ◆ How can we avoid problems which are inherent to the system?

A critical self-reflection is necessary to provide honest answers to all these questions. A structured concept of training and education in ultrasound-guided regional anaesthesia is helpful to change clinical practice, but the initial