Online Appendix 6 Image guided pleural biopsy

Safety and Preparation

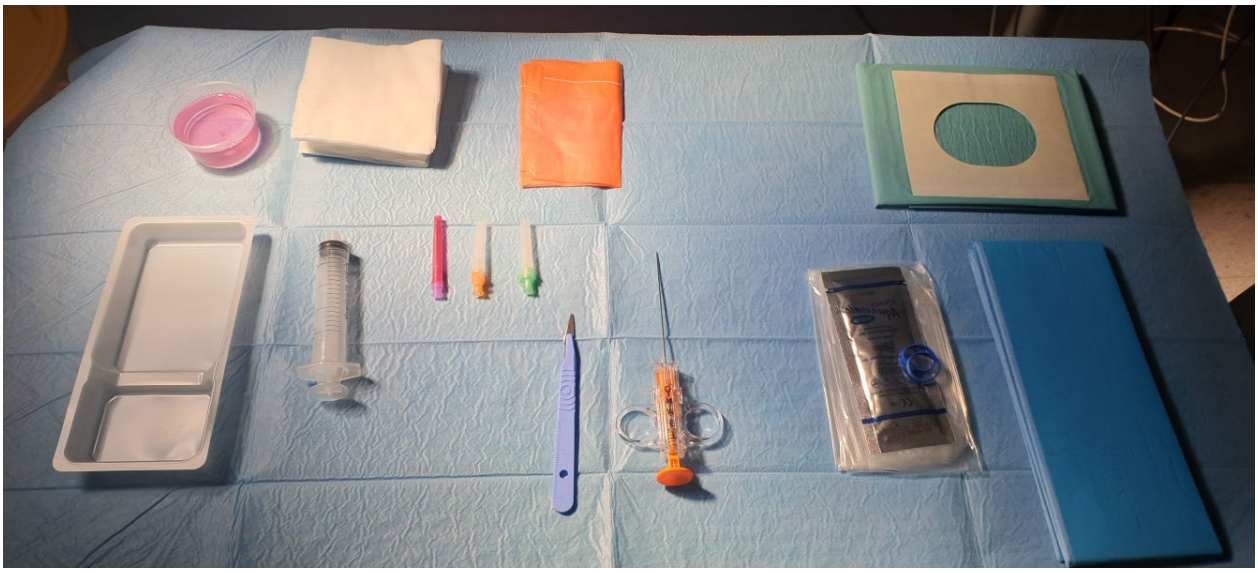
Please refer to Section 1: Safety and preparation for pleural procedures in the main BTS Clinical Statement on Pleural Procedures document.

Equipment

The equipment and tray set-up needed for image guided pleural biopsy is shown in Box 1 and Figure 1 respectively.

Box 1: Equipment needed for image guided pleural biopsy	
18G (or similar) cutting needle	Blunt fill needle x1, orange needle x1, green needle x2
Lidocaine 1%	Sterile US cover
Chlorhexidine 2% (or alternative cleaning solution)	Scalpel
Aperture drape x1	Wound care pack
Blue drapes x2	Gauze swabs
20 ml luer lock syringe	Mepore dressing
50 ml luer lock syringe x2	3-4 saline ampoules
Universal ‘white top’ specimen pot	Histology ‘orange top’ specimen (cytolyte)

Figure 1: Tray set up for ultrasound guided pleural biopsy



Pre-procedure preparation

The preferred patient position for pleural biopsy is the lateral decubitus. If a recent CT scan is available, this should be used for biopsy site planning

Screening US should be conducted across the lateral hemithorax to look for any sonographically identifiable pleural thickening, judge its depth including any characteristics that may make it an optimal target – i.e. irregularity, nodularity. Intercostal artery screening is recommended prior to insertion of the needle to

potentially reduce the risk of complications. The biopsy site and intercostal artery screen can be determined using the standard 4 to 8 Mhz curvilinear probe.

Inferior biopsy sites closer to the diaphragm have shown to be more likely to elicit positive biopsy samples as secondary metastases are most likely to be found here. Where possible a biopsy site with underlying pleural effusion to act as a buffer is preferable to reduce the risk of lung perforation and subsequent pneumothorax. **If pleural fluid is not present it is preferable for the biopsy to be obtained under CT guidance.**

Operator should be scrubbed and sterile in surgical cap, mask, sterile gown and gloves.

Procedure

1. Clean the hemithorax with chlorhexidine (or other appropriate agent) and create a sterile field using drapes, allowing enough space around the marked intervention spot for the use of real time ultrasound.

   (Optional: administer 1-2 mg midazolam for awake sedation)

2. Draw up 20 ml 1% lignocaine and inject lidocaine subcutaneously. While the subcutaneous lidocaine is taking effect, wrap the ultrasound probe in sterile sheath. Inject LA under real-time guidance at 45° angle through the entire depth of the parietal pleura, aspirating pleural fluid to ensure appropriate access and obtain diagnostic sample.
3. Prepare Temno cutting biopsy needle, demonstrating the 'firing' mechanism of the needle to the patient outside their chest so as not to cause alarm when they first hear the sound. Prepare a small tray of saline to rinse the needle between biopsies after releasing the tissue cores into the containers containing the cytolyte solution.
4. Make an approximately 1 cm skin incision along the biopsy site. The cutting needle is then placed approximately half a centimetre proximal to the initial site to ensure that the core of tissue obtained will contain the full thickness of the pleura and the needle tip ends into the pleural fluid – an oblique biopsy tract.
5. Obtain 3-7 core biopsies – if the pleura is not very thickened, multiple passes may be necessary to obtain diagnostic pleura *(with each sequential pass, be aware that the introduction of air may negatively impact the quality of the real-time ultrasound image).*
6. Check for any evidence of bleeding in between biopsies using the doppler function and particularly at the end of the procedure.

Post procedural care

Please refer to Section 5.8.1: Post procedural care in the main BTS Clinical Statement on Pleural Procedures document.