

Chapter 2

On-Site Evaluation and Specimen Preparation

Once FNA is performed, direct smears are prepared with one to two drops of fluid expressed from needle, typically two smears per needle pass. One smear is air dried and stained with Diff-Quik stain, and the second smear is wet-fixed in 95 % ethanol and later Papanicolaou stained. Residual material is rinsed from the needle into a balanced salt solution (e.g., Hanks) for ancillary studies or cell block (CB) preparation. Touch preparations of needle core biopsies (NCB) can also be performed if necessary for on-site evaluation. If the aspirator is working alone (i.e., no on-site evaluation), the specimen can be collected in a liquid-based cytology preservative solution for processing by ThinPrep (Cytoc Corporation, Marlborough, MA) or SurePath (BD, Franklin Lakes, NJ) techniques. The advantages of using liquid-based cytology include reduction in variability in smear quality, the ability to make multiple slide preparations for immunohistochemical staining and molecular studies, shorter screening time, and reduction in background debris, including tumor diathesis. The disadvantages include inability to perform real-time adequacy evaluation, submission of all material for Papanicolaou staining, and higher cost. NCBs are often performed in conjunction with FNA. Touch preparations of NCBs may also be performed for on-site evaluation, though not preferred because of the potential disruption/destruction of the NCB due to excess handling. On-site evaluation is

extremely useful in specimen triage for flow cytometry studies, microbiology cultures, and for CB to perform immunocytochemistry or molecular studies. It is also useful to ensure target sampling for clinical research or trials.

Suggested Reading

- Gill G. Cytopreparation—principals and practice, Essentials in cytopathology, vol. 12. New York: Springer; 2013.
- Nasuti JF, Gupta PK, Baloch ZW. Diagnostic value and cost-effectiveness of on-site evaluation of fine-needle aspiration specimens: review of 5,688 cases. *Diagn Cytopathol*. 2002;27:1–4.
- Schmidt RL, Witt BL, Lopez-Calderon LE, Layfield LJ. The influence of onsite evaluation on the adequacy rate of fine-needle aspiration cytology: a systematic review and meta-analysis. *Am J Clin Pathol*. 2013;139:300–8.

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