Background

Rapid-On-Site-Sampling-Evaluation (ROSE) support for trans-endobronchial ultrasound-guided fine needle aspiration (EBUS-FNA) is useful to facilitate adequate sampling of lymph nodes (LN) to distinguish granulomatous lymphadenopathy from neoplasms. Whereas studies have adequately assessed the diagnostic efficacy of ROSE, reports describing technical challenges faced by cytologists are lacking; particularly in patients likely burdened with excessive mucin production. Excessive mucin may interfere with Diff-Quik staining of air-dried cytopreparations potentially leading to suboptimal visualization of granulomas or cells. This problem may lead to interpretive dilemmas in distinguishing between epithelioid and endobronchial cells during ROSE, and in final case verification. Resolution of this potential problem was sought.

Methods

From 45 ROSE EBUS-FNA procedures, to rule out granulomatous lymphadenopathy, cyto-preparations were reviewed to assess degree of mucin relative to a comparison between preliminary ROSE findings during the procedure and final verification.

Results

Six of 45 EBUS-FNA cases (13%) posed this problem. Excessive mucin caused two problems:

(a) Slowed the rate of air-drying of cytopreparations;
(b) Interfered with penetration of Diff-Quik (i.e., blue) staining dyes.

Cytomorphologic overlap between epithelioid cells and endobronchial cells led to equivocal interpretations due to the effects of mucin in such procedures. Mucin hindered rapid, confident identification of endobronchial cell terminal bars or cilia; and, overall cellular blurring hindered confident distinction between truly elongated nuclei or those due to artifact. In trial cases, extended staining times resolved this problem, leading to interpretive confidence.

Conclusions

In EBUS-FNA cases yielding small, disintegrating clusters of epithelioid cells forming poorly-formed granulomata, cytologists are required to methodically reconcile potentially-simulating cell-types to provide valid ROSE support. Additional dips in the Diff-Quik blue stain solution to emphasize nuclear definition and morphology, and use of a hot plate to air-dry smears rapidly, collectively led to substantial improvements in interpretive confidence overall. Of the 6 cases revealing excessive mucin, for which the aforementioned corrective techniques were applied, the concordance rate between preliminary and final verification reached 80%.

We raise awareness of this potential problem by presenting cytomorphology from select cases in our clinical setting after additional staining. Ultimately, extent of Diff-Quik staining is case-dependent and smear-dependent; cannot be standardized for all cyto-preparations and FNA passes.

References