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ORIGINAL ARTICLE

Evaluation of cytopathology fellow performance for rapid on-site evaluations of fine-needle aspirates over a 6-year period

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Introduction Rapid on-site evaluation (ROSE) of fine-needle aspirates is an invaluable teaching tool for a cytopathology (CyP) fellowship. The ability of fellows to accurately perform ROSEs without direct attending supervision is not well documented in the literature. This study reviewed ROSEs performed independently by CyP fellows and focused on diagnostic discrepancies with managerial implications.

Material and methods All fine-needle aspirates with ROSE documentation performed at the University of Virginia from October 1, 2007 to March 31, 2013 were reviewed and compared with the final diagnosis. Cases were only included if a CyP fellow performed the ROSE. Discrepancy between ROSE and final diagnosis was categorized according to the change. Numbers of false positive (FP) and false negative diagnoses, organ site, and recurrent interpretative pitfalls were noted.

Results CyP fellows performed 6815 ROSEs in 6 years. An attending cytopathologist was present 8% of the time. Of ROSEs without direct attending supervision (6224 fine-needle aspirates), the preliminary and final diagnoses were identical in 95% of cases. FP rate was 1.06%. The most frequent categorical change occurred from ROSE of "atypical" to final diagnosis of "malignant." The most common sites involved in FP diagnoses were pancreas/biliary tract, lung, and lymph node. Experience gained over the fellowship year did not significantly affect the FP rate. Errors encountered are known interpretative challenges.

Conclusions This is the largest study addressing discrepancies between ROSE and final diagnosis and the first study examining CyP fellow performance. Our results affirm that fellows perform extremely well when performing ROSEs independently.

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Introduction

Rapid on-site evaluation (ROSE) of fine-needle aspirates (FNAs) has been shown to increase diagnostic yield and decrease the need for repeat procedures.[1-3] A ROSE service is valuable with regard to assessment of specimen adequacy and triage of FNA material for ancillary studies. In many cases, a ROSE provides the clinician with a preliminary diagnosis to guide clinical decisions. However, in many instances, a ROSE is based on a fraction of the obtained FNA material and may occasionally differ from the final interpretation. This discrepancy may or may not affect patient management.

A ROSE service is an invaluable teaching tool for a cytopathology (CyP) fellowship. Although the presence of an attending cytopathologist providing direct supervision for every ROSE may be desirable and financially rewarding, it also necessitates an unpredictable time commitment and lessens the overall responsibility and development of the diagnostic skills of the CyP fellow. At our institution, attending faculty accompany fellows in the beginning of their training for 1 month (and afterward as needed) with fellows on average performing >90% of ROSEs with indirect supervision. The ability of CyP fellows to accurately perform ROSEs independently is not well documented in the literature.

This study reviewed ROSEs performed by CyP fellows with a focus on diagnostic discrepancies with managerial implications. Given this context, this study set forth to answer the following questions:

1. How often does the ROSE differ from the final diagnosis?
2. What are the categorical changes for these discrepancies?
3. What organ sites are commonly involved?
4. How many of these diagnostic discrepancies are clinically significant (ie, false-positive diagnosis prevents acquisition of diagnostic material or leads to unnecessary surgical intervention/medical treatment)?
5. What are recurrent interpretative pitfalls for CyP fellows during ROSE of FNAs?
6. When during a CyP fellow's training do false-positive ROSEs occur?
7. What are learning points from interpretative pitfalls encountered during the authors' fellowship year?
8. What are the advantages and disadvantages of a CyP fellow–driven ROSE service?

Materials and methods

All FNAs with ROSE documentation performed at the University of Virginia from October 1, 2007 (start of ROSE FNA service) to March 31, 2013 were reviewed and compared with the final diagnoses. FNAs were performed by CyP fellows, clinicians, or radiologists. Cases were only included if a CyP fellow performed the ROSE. The month and presence/absence of an attending cytopathologist during the ROSE was documented. Discrepancy between ROSE and final diagnosis was categorized according to the change. Categories included nondiagnostic, benign non-neoplastic, benign neoplastic, atypical, and malignant. ROSEs of "suspicious for malignancy" were included in the "malignant" category. False negatives were defined as a ROSE of nondiagnostic to a diagnostic final interpretation. False positives were defined as a ROSE-to-final discrepancy with managerial implications (ie, ROSE diagnosis of "malignant" with final diagnosis of "nondiagnostic"). Numbers of false-positive and false-negative diagnoses, organ site, and recurrent interpretative pitfalls were noted.

Results

CyP fellows performed 6815 ROSEs over a 6-year period. An attending cytopathologist providing direct supervision was present 8% of the time. Of the ROSEs performed without direct attending supervision (6224 FNAs), the preliminary to final diagnosis was identical in 95% of cases. There was discordance in 326 cases between ROSE and final interpretation (Table 1.) The most frequent categorical change observed was a ROSE of "atypical" to a final interpretation of "malignant." The overall false-negative and false-positive rates for ROSE by CyP fellows were 0.96% and 1.06%, respectively (Table 2). Of the

Table 1 Discordant ROSE versus final diagnosis.

ROSE	Final diagnosis
Nondiagnostic	Benign non-neoplastic: 13
	Benign neoplastic: 3
	Atypical: 9
	Malignant: 35
Benign non-neoplastic	Nondiagnostic: 2
	Other benign non-neoplastic: 1
	Benign neoplastic: 1
	Atypical: 6
	Malignant: 7
Benign neoplastic	No changes
Atypical	Nondiagnostic: 16
	Benign non-neoplastic:10
	Benign neoplastic: 1
	Malignant: 128 (most common)
Malignant	Nondiagnostic: 9
	Benign non-neoplastic: 12
	Benign neoplastic: 6
	Atypical: 23
	Other malignant: 44

Abbreviation: ROSE, rapid on-site evaluation(s).