

What method can we choose if rapid on-site evaluation is not available for the endoscopic ultrasound-guided tissue acquisition of upper gastrointestinal subepithelial lesions?

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See “Stereomicroscopic on-site evaluation in endoscopic ultrasound-guided tissue acquisition of upper gastrointestinal subepithelial lesions” by Seigo Nakatani, Kosuke Okuwaki, Masafumi Watanabe, et al., Clin Endosc 2024;57:89–95.

Endoscopic ultrasound-guided tissue acquisition (EUS-TA) is used for the diagnosis and staging of various upper gastrointestinal subepithelial lesions. EUS-TA includes both fine needle aspiration (FNA) and fine needle biopsy (FNB), with FNB designed to obtain larger histological specimens and preserve tissue architecture. Multiple factors affect the diagnostic yield and accuracy of EUS-TA.

The first factor is the FNA/FNB needle. Many new needles have been recently introduced, and the selection of needle size or shape mostly depends on the location of the lesion. The second factor is the FNA/FNB technique. The use of suction, stylet, the number of needle passes, to-and-fro movements, and even fanning techniques can affect the tissue acquisition yield.¹ The third factor is the sampling method. Various methods such as standard suction, wet suction, capillary method, or door-knocking method can be used. The fourth factor is the

availability of rapid on-site cytopathological evaluation (ROSE). ROSE refers to the immediate cytologic assessment of FNA samples by a cytopathologist. The last factor is sampling processing. All of these factors can affect the diagnostic yield and accuracy of EUS-TA.

ROSE reduced the number of needle passes in some observational studies²; however, later meta-analyses reported no additional benefit in terms of diagnostic yield.³ Based on these results, the European guideline does not recommend the routine use of ROSE.⁴ In practice, ROSE is not available in many hospitals. It can be time-consuming despite reducing the number of needle passes, and reimbursement for cytologists is also a barrier to its use.

Several alternatives to ROSE have emerged, aiming to streamline diagnosis and reduce needle passes. One promising approach is macroscopic on-site evaluation (MOSE), first proposed by Iwashita et al.⁵ MOSE involves immediate assessment of specimens by endoscopists, focusing on readily visible macroscopic visible cores (MVCs) obtained using a 19-gauge FNA needle. Eliminating the need for a cytopathologist, MOSE offers potential time savings. MVCs larger than 4 mm can reliably indicate specimen adequacy.

A recent meta-analysis encompassing 1,508 lesions demonstrated MOSE's efficacy. The pooled accuracy, sensitivity, specificity, and positive and negative predictive values of FNA and/or FNB specimens in MOSE-based diagnosis were 91.3% (95%

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confidence interval [CI], 88.6–93.3; $I^2=66\%$), 91.5% (95% CI, 88.6–93.6; $I^2=66\%$), 98.9% (95% CI, 96.6–99.7; $I^2=80\%$), 98.8% (95% CI, 97.4–99.5; $I^2=33\%$), and 55.5% (95% CI, 46.9–63.9; $I^2=95\%$), respectively.⁶ Notably, MOSE using newer-generation FNB needles yielded comparable diagnostic rates.

However, limitations exist. Utilizing the 19-gauge needle can be challenging for angled lesions in the duodenum or stomach. Additionally, MOSE lacks standardization, posing potential reproducibility concerns.

A refined version, stereomicroscope MOSE (S-MOSE), bridges the gap between MOSE and ROSE. Okuwaki et al.⁷ employed a stereomicroscope to determine the optimal cutoff length for visible white cores indicative of a pathological diagnosis, using samples obtained using a 22-gauge Franseen needle. Similar to MOSE, cutoff lengths ≥ 4 mm yielded significantly improved diagnosis. Importantly, stereomicroscopic magnification facilitates differentiation between blood clots and actual core tissue, enabling endoscopists to perform the assessments readily in the endoscopy room. This potentially shortens the overall procedure time compared with ROSE.⁷

Another alternative is sample isolation processing by stereomicroscopy (SIPS). This method involves separating tissue core from red components such as red blood cells and fibrin during magnified stereomicroscopic examination. The resulting cleaned tissue core, called stereomicroscopically visible white cores (SVWCs), offers superior specimen quality for diagnosis.⁸ SIPS boasts a high sensitivity of 98.8% for malignancy in upper gastrointestinal subepithelial lesions when an SVWC cutoff value of ≥ 3.5 mm or ≥ 4 mm is used with a 22-gauge Franseen FNB needle. While frequently employed in daily clinical practice, SIPS's time-consuming and complex nature presents a drawback. To address this, Okuwaki et al.⁹ developed the automated multiband imaging system for calculating the SVWCs whose results strongly correlated with manual SVWC assessment in biopsy samples.

In this issue of *Clinical Endoscopy*, Nakatani et al.¹⁰ introduce stereomicroscopic on-site evaluation (SOSE). Similar to S-MOSE, SOSE utilizes stereomicroscopic examination but omits the SIPS processes. The key difference lies in SOSE's focus on a simple yes or no assessment—does the visible white core reach the 4 mm cutoff length? This eliminates the need for precise core length measurement, potentially making most SOSE simpler than S-MOSE. Notably, the optimal cutoff length of 4 mm remains consistent across MOSE, S-MOSE, SIPS, and SOSE.

In applying SOSE to EUS-TA of upper gastrointestinal subepithelial lesions, Nakatani et al.¹⁰ achieved an 80% visible white core collection rate in the first pass, and 78% per puncture in all passes. The 4 mm core cutoff value demonstrated a sensitivity of 93.2% for histology, and 96.6% for cytology+histology.

As the most recent addition to ROSE alternatives, SOSE stands out for its combined advantages of simplicity and time-saving efficiency. Additionally, the ability to use a 22-gauge needle in SOSE expands its applicability to various upper gastrointestinal subepithelial lesions, including those located in the angulated areas of the duodenum. The promising results of SOSE raise expectations for its potential applications in EUS-TA of lesions in the mediastinum or pancreas.

Conflicts of Interest

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