EUS-FNA for solid lesions: An idea whose time has passed?

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For over 25 years, EUS-FNA has been the standard of care for tissue acquisition of solid lesions including tumors, masses, and lymph nodes. However, in the past several years, fine-needle biopsy (FNB) devices became commercially available. These devices demonstrated higher histological yield and better diagnostic accuracy than their FNA forerunners. One international, prospective, randomized study compared the efficacy of a 25-gauge FNA device and a 20-gauge FNB device for sampling solid lesions in over 600 patients.[1] Technical success was achieved in essentially all patients regardless of the needle used (100% with FNA and 99% with FNB). The FNB needle had a significantly higher histological yield (77% *vs.* 44%) and greater accuracy for malignancy diagnosis (87% *vs.* 78%) and overall tissue classification based on the Bethesda cytopathology nomenclature system (82% *vs.* 72%).

The European guidelines have commented on the equal effectiveness of FNB and FNA needles in the sampling of pancreatic masses.[2] However, the guideline was based mainly on studies using the first-generation reverse bevel FNB needles, as only a very limited number of randomized-controlled trials testing newer end-cutting FNB devices were available at that time. The American guidelines have not addressed this issue in detail.[3]

A recent network meta-analysis of 16 randomized trials showed that newer FNB needles had clearly outperformed FNA.[4] Franseen needles significantly outperformed reverse-bevel needles (risk ratio [RR]: 1.21 [95% confidence interval (CI): 1.051.40] for accuracy and 1.31 [95% CI: 1.051.22] for adequacy) and FNA needles (RR: 1.21 [95% CI: 1.011.25] for accuracy and 1.07 [95% CI: 1.021.13] for adequacy).

To this end we ask: should FNB be the standard of care for EUS guided tissue acquisition? Is it time to close the chapter on FNA?

To answer these questions, several considerations should be kept in mind. When compared to FNB, FNA needles are less expensive. While the cost of FNA is likely to be less when compared to FNB, the higher cost of an FNB needle may offset the cost of having

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to do repeat procedures due to poor FNA sampling or the need for, and cost of, cytopathologic on-site rapid evaluation (ROSE). A cost-effective analysis from the perspective of a third-party payer showed that EUS-FNB with a strategy of EUS-FNB – two passes without on-site cytopathology evaluation was more cost-effective than EUS-FNA with a strategy of FNA – passes dictated by on-site cytopathology evaluation for both pancreatic and nonpancreatic lesions.[5] The results were consistent across multiple sensitivity parameters.

FNA is a time-tested technique which often requires ROSE. EUS-FNA does not retain the stroma or associated histologic architecture of surrounding tissue, which may be necessary to provide a definitive diagnosis in many patients. On the contrary, EUS-FNB, particularly with newer end-cutting designs, has shown to preserve cellular architecture. FNB has become an increasingly useful tool in establishing a definitive diagnosis of malignancy in a variety of solid lesions.[6-8] In addition, FNB does not necessitate ROSE which has far reaching implications pertaining to costs and hospital resources allocation.[9]

As an alternative to ROSE, macroscopic on-site evaluation (MOSE) or gross visual inspection may be a good alternative.[10] This is particularly true in regions where ROSE is not economically feasible or impossible. A multicenter study comparing different FNB needle size showed that MOSE showed high diagnostic accuracy and it increased with larger sized FNB needles and more than two passes.[11] Studies comparing FNA-ROSE and FNB with/without MOSE are lacking.

It was once thought that FNA samples were sufficient to provide intact cells and nucleic acids for next generation sequencing.[12] Other reports have reported that FNA samples are often insufficient, contaminated, of poor-quality DNA and suboptimal for genetic analysis.[13] However, FNB has been shown to overcome these shortcomings.[14]

In summary, EUS-guided FNA is a tried and tested means for sampling solid lesions.[15,16] The cost of FNA is lower than that of FNB and frequently requires ROSE. However, FNB represents a more effective approach at targeting solid lesions with the benefit of higher accuracy, being cost-effective, does not require ROSE, and yields adequate sampling to conduct personalized medicine including genetic analysis. Given these promising features, is it time to forgo EUS-FNA? When it comes to the sampling of solid lesions, FNB has largely become the *de facto* standard of care. FNA should, with rare exceptions, be limited to the sampling of cystic lesions.

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