EUS is trending!

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I finished my EUS training 20 years ago. Time flies… Over this time, trends have come and gone. Clearly, there have been two major trending issues: tissue acquisition and therapy. Overall, both trends are strongly positive in terms of research, technical improvements, and adoption in routine clinical practice.

TRENDS IN EUS-GUIDED DIAGNOSIS AND TISSUE ACQUISITION OF SOLID LESIONS

Arguably, EUS-guided biopsy transformed EUS from a procedure "looking for an indication," to a uniquely powerful clinical tool, with a virtually indispensable place in the management algorithms for the diagnosis and staging of various cancers. Research has focused primarily on trying to establish the best technique to maximize the diagnostic yield for various types of lesions.[1] This includes comparative studies of variables such as needle size, suction type, stylet use, and sampling pattern. While studies show no conclusive evidence to justify the use of suction of any type, nor the stylet, many experts continue to use both. Anecdotally, the one thing that most successful EUS-FNAs have in common is adequate movement of the needle within the target lesion. Therefore, one must answer the following question: If all "experts" essentially get the same results, including those who use a simplified technique with no stylet and no suction, then why not use the simplified technique -- to save time, effort, and money?

The trend in tissue acquisition is no longer in sampling technique, but more in the development of core needles. After several years of questionable results with larger gauge needles and different needle tip designs, the latest aggressive tip designs appear to finally produce true cores, even in traditionally difficult lesions. The implications are game-changing: with a standard FNA technique, quality cores can be obtained routinely with a 22-gauge needle, such samples allow for complete histological analysis (including special stains and genetic testing), and the macroscopic quality of the specimens seems to obviate the need for on-site assessment – which is unavailable in many centers.[2] However, these needles are more expensive than standard FNA needles – which may make selective use (*e.g.*, for more difficult cases, failed FNA) the most cost-efficient option for certain high-volume EUS units.

An unexpected benefit of core biopsies is the ability to provide a "positive" diagnosis for a benign disease. When FNA is negative for cancer, this simply means there are no cancer cells in the specimen. This can be due to inadequate cellularity, tumor necrosis, or the true absence of cancer. The fear of a false-negative result can be unsettling and may result in further testing or even diagnostic surgery. With core biopsies, specimens

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that are negative for cancer may also provide concrete evidence of a benign pathology such as: chronic pancreatitis, autoimmune pancreatitis, schwannoma, etc. This added reassurance might help reduce further futile testing (personal observation).

One may wonder how this will affect the trend line for EUS "enhanced imaging" techniques such as elastography, contrast-enhanced EUS, and tissue harmonics. These techniques are supposed to help distinguish cancer from benign lesions in indeterminate cases or even to help target biopsies when FNA is negative.[3] The data to date with new core needles suggest that the number of negative biopsies will decline and, as stated earlier, even when biopsy as negative for cancer, their ability to provide histological proof of benign disease will reduce the number of indeterminate cases. Therefore, the likelihood that enhanced imaging will provide incremental value appears low. However, they main remain helpful when biopsy is exceptionally difficult or contraindicated (*e.g.*, coagulopathy, risk of tumor seeding).

Further work is required to determine whether there remains any place for EUS-FNA – other than cost-minimization. Proponents of enhanced imaging should also work to provide evidence of the ability of these techniques to truly improve patient outcomes when core biopsy is indeterminate (for both cancer and benign disease).

TRENDS IN EUS-GUIDED THERAPY

EUS is clearly able to identify, puncture, and drain collections and obstructed biliary and pancreatic ducts, and more recently, EUS-guided gastroenterostomy has been performed successfully. However, these techniques require experience with various types of wire-guided devices, fluoroscopy, and stents, which are often designed for endoscopic retrograde cholangiopancreatography (ERCP), and not for EUS.[4] The question is whether these techniques can or should be done by most endosonographers – as opposed to a select few highly experienced individuals in high-volume centers. Drainage of both sterile and infected collections is generally safe, simple, and effective. As such, primary attempted EUS-guided drainage is now generally accepted as the "standard of care." The skills required to perform these procedures would appear to be within reach of reasonably experienced endosonographers – even if they have no experience with ERCP. The collections are generally large, so precise needle and wire manipulation and fluoroscopy are generally not required.

Biliary and pancreatic drainage and EUS-guided gastroenterostomy are considerably more technically demanding, and even in expert hands, although often effective, can have fairly high complication rates.[5] These procedures would therefore appear to be beyond the grasp of the great majority of endosonographers. However, with the development of new hot delivery systems, this may change. This is hopefully a trend for industry, to invest in the development of devices that are specifically designed for EUS-guided therapy – devices that deploy stents that are easily visible by ultrasound, and require no guide-wires or fluoroscopy. The currently available systems allow for safe and effective EUS-guided cholodochoduodenostomy, cholecystostomy, and cystogastrostomy in literally seconds, with no need for experienced endoscopy personnel (since the endosonographer controls the entire delivery system). Hopefully, newer stents and equally simple deployment systems are forthcoming, for other indications such as hepatogastrostomy. If this trend continues, all aspects of EUS-guided therapy could become accessible outside of high-volume centers. It is even possible that these techniques could replace ERCP for primary drainage.

This trend toward simple, effective, purely EUS-guided therapy can also be seen with the advent of EUS-guided radiofrequency ablation. Emerging data show that this is a promising technique for the management of neuroendocrine tumors and possibly locally advanced pancreatic adenocarcinoma.[6] The technique involves the application of real-time, EUS-guided, controlled, low-wattage heating probes by a technique that is very similar to standard EUS-FNA and may avoid considerably more morbid surgical options.

Further work will hopefully show that these simple techniques consistently provide good outcomes, outside of high-volume centers.

THE NEXT GREAT TREND?

While exciting diagnostic and therapeutic advances hold our attention, it may be important to highlight the one trend that could be the most important for patients – the increasing integration of EUS into general gastrointestinal (GI) training and practice. What is the true clinical value of exciting advances in

EUS capabilities, if they are not accessible to enough patients? EUS training is available in most academic centers but is offered as an extra year fellowship, after full GI training. As such, it remains limited to a selected group of physicians willing to make this extra sacrifice, to allow them to include EUS in their GI practice. Hence, while there is a trend toward increasing access to trained endosonographers, the trend line may be unnecessarily flat. Why not make the trend line steeper by including EUS training as part of basic GI training? Newer linear-array EUS scopes are smaller and durable and as easy to manipulate as a standard gastroscope. Therefore, there is no reason to not start EUS training at the beginning of GI fellowship – instead of at the end. In this way, a huge volume of experienced endosonographers could be introduced into general GI practice, on an ongoing basis. Combining this high number of qualified endosonographers with access to simple, effective, diagnostic and therapeutic devices could lead to a literally exponential trend of integration of quality EUS into the management of wide variety clinical problems. Who knows where will we be in 20 years…

Conflict of Interest

There are no conflicts of interest.

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