

# EUS-guided versus percutaneous liver biopsy: Do we have a winner?

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Liver biopsy (LB) remains a valuable diagnostic procedure despite advancements in noninvasive assessment of hepatic parenchymal disease. It is likely that demand will continue to grow in the near term as the number of patients with nonalcoholic steatohepatitis continues to increase. LB was first described by Ehrlich in 1883, but the current technique of percutaneous LB can be traced to Menghini's 1958 paper with the intriguing title "One-second needle biopsy of the liver."<sup>[1]</sup> However, even today, many percutaneous liver biopsies are done without "real-time" image guidance, and not infrequently without any image guidance at all.

In the last several years, the use of endoscopic ultrasound (EUS) guidance for LB has gained traction. The potential benefits for EUS-LB are numerous and include a more comfortable experience for the patient, the ability to do bilobar biopsies (decreasing sampling error),<sup>[2]</sup> and the availability of real-time imaging during the biopsy. Current needles and biopsy techniques provide liver cores that are comparable, or better than, samples obtained by the percutaneous or transjugular approaches in terms of standard outcome metrics regarding sample length and number of portal triads.<sup>[3]</sup> Adequacy for pathologic interpretation is nearly 100% across multiple studies.<sup>[4-6]</sup>

We would like to bring attention to a recent prospective randomized trial by Bang *et al.* that sought to compare percutaneous LB to EUS-guided LB.<sup>[7]</sup> The results of this study are a significant outlier in the literature, and we have several concerns with the manuscript's methodology. The authors created came up with a definition of an "optimal" LB as one being 25 mm long with >10 complete portal triads (CPTs). The meaning of "optimal" as the authors define it is unclear and without precedent in the literature. By the authors' own criteria, only 57.9% of percutaneous LBs were "optimal," which further underscores the nebulous and misleading use of this term. Importantly, the study showed that both percutaneous and EUS-guided techniques yielded samples that could be evaluated by a pathologist in 100% of cases.

The length of what is considered an adequate LB has been something of a moving target. A highly cited reference states that a specimen length of 15 mm is adequate for diagnosis.<sup>[8]</sup> A widely cited review from the American Association for the Study of Liver Disease<sup>[9]</sup> concluded that 20 mm of tissue is adequate in length, as well as one that contains ≥10 CPTs. The 2020

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multisociety British guidelines use the benchmark of 20 mm in length and more than 10 portal tracts.<sup>[10]</sup> The latest Royal College of Pathologists (RCP) guidelines also recommend LB specimens >20 mm in length.<sup>[11]</sup> Only the 2014 RCP guidelines<sup>[12]</sup> used the  $\geq 25$  mm criterion, and this was revised down to 20 mm with the latest version.

Another important limitation of the study by Bang *et al.* is the method utilized for sample size calculation. The author's power analysis is based on a meta-analysis,<sup>[13]</sup> which weighted use of a 19G TruCut needle, which is inferior to regular 19G needles, and is no longer used in clinical practice. Our previously published work with Franseen needles demonstrated adequate histologic yield in 78% of patients from single lobe biopsy and 100% of patients with bilobar specimens.<sup>[14,15]</sup> If 78% adequacy was used for the power analysis, the sample size needed would be 290 patients (145 patients in each group) compared to only 40 in Bang's study. Based on this, the study is significantly underpowered.

A third concern is that the wrong technique was used for the EUS-guided needle biopsies in this study. The authors used a no suction technique, which has never been evaluated in a prospective study. In our experience, no suction yields inadequate specimens. We conducted a prospective randomized study of "dry" *versus* "wet" suction for EUS-LB.<sup>[16]</sup> (Wet suction involves priming the needle lumen with fluid and using suction with the vacuum syringe). Wet suction was superior (98% adequacy *versus* 80% for dry suction). Suction did not lead to tissue fragmentation. The no-suction needling technique used for this study likely contributed to lower percentage of "optimal" biopsies in the EUS-LB group.

The Bang *et al.*'s study did a cost analysis of the two methods of LB, and not surprisingly, the percutaneous method was less expensive. This is mainly due to the added cost of sedation for an endoscopic procedure. However, the cost estimates do not consider instances in which there is an indication for an endoscopy, EUS, or colonoscopy in addition to the LB. This is a common event, and cost savings would result from doing these combined procedures. In addition, many liver biopsies done by interventional radiologists utilize a transjugular or computed tomography-guided approach, which would cost more than an ultrasound-guided biopsy which was the assumption in the cost analysis. However, providing a better patient experience is increasingly important, even if there might be a

higher procedure cost. A good example is propofol sedation for endoscopic procedures, such as ERCP or colonoscopy. While it is true that many of these could be done with "conscious sedation," deeper levels of monitored sedation provide a better patient experience, allow the endoscopist to optimize the technical aspects of their procedure, and are overall safer for the patient.

EUS-LB is now widely performed around the world. Many endosonographers have embraced the EUS-LB technique and have had excellent results with an outstanding safety profile. EUS-guided LB with optimal technique can achieve outstanding histologic yields. The recent comparative study has several critical shortcomings in design and technique and cannot be relied upon for clinical decision-making.

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There are no conflicts of interest.

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