



Needle Tip Tracking in Liver Biopsy Reduces Time, Increases Accuracy

Prospective Comparison of Free-hand and Electromagnetic Needle Tracking for US-guided Percutaneous Liver Biopsy

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Summary and Methods

The authors compared percutaneous liver biopsy procedures performed using free-hand ultrasound-guidance to those performed using electromagnetic needle tracking (EMT). Thirty percutaneous liver biopsies were performed using conventional free-hand US guidance and 30 using the eTRAX™ Needle Tip Tracking system and the GE Healthcare LOGIQ E9 ultrasound system.

The study compared needle placement time and number of needle pullbacks and punctures in both groups. The EMT group used a 16-gauge cannula and both groups used an 18-gauge core biopsy needle.

Discussion and Results

Operator experience and lesion location and size have been reported factors affecting success of conventional liver biopsies. Prior efforts have been made to improve needle placement accuracy and shorten procedure times in biopsy procedures. (1-3)

EMT has contributed to addressing these issues through the real-time display of the needle tip and intended needle path as shown in a prior publication. (4)

This study prospectively compared EMT versus free-hand biopsy and found EMT needle placement time shorter than free-hand.

The EMT group experienced significantly reduced needle placement times ($45.8 \text{ s} \pm 48.1$ vs. $143.2 \text{ s} \pm 122.1$; $P < .01$), a significant reduction in needle pullbacks (15 vs. 55), and higher diagnostic accuracy (100% vs. 96.6%).

No major complications occurred in either group.

Conclusions

Ultrasound-guided liver biopsies performed with EMT showed:

- significant reduction in needle placement time
- reduced number of needle pullbacks required for redirection
- reduced technical difficulty regardless of user experience

Author Commentary

"Here we present a prospective comparative clinical trial in which we evaluated EMT-guided versus freehand percutaneous liver biopsy. We found that needle placement time was significantly shorter under EMT guidance than with the use of the freehand technique."

"The consequential positive impact on needle tip localization and needle path prediction have led to increased accuracy of ultrasound-guided electromagnetically tracked biopsies. Such high level of accuracy have permitted easy, fast, and safe needle placement in targeted liver nodules, with a low complication rate, regardless of lesion conspicuity and location or operator experience."



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