



Percutaneous Renal Biopsy using Needle Guide Technique Decreases Post-Biopsy Complications and Improves Tissue Sample Yield

Real-time ultrasound-guided percutaneous renal biopsy with needle guide by nephrologists decreases post-biopsy complications

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Summary and Methods

One of the largest single-center studies comparing the yield and complication rate of 2,138 kidney biopsies was performed by Nephrologists in a tertiary care teaching institute in India. The patient demographic ranged from pediatric to adult and the kidney biopsy types included native, graft and transplanted organs. During the first observational period spanning April 2004 - December 2010, 1,510 ultrasound-guided (Philips HDIIE, Bothell, WA) biopsies were performed by Nephrologists with the imaging support of a Radiologist and without the use of a biopsy needle guide device. During the second period of evaluation, January 2011 - March 2013, 628 renal biopsies were performed solely by Nephrologists using both real-time ultrasound imaging (Toshiba Medical Systems Xario, Tokyo, Japan) ultrasound systems and Ultra-Pro II™ needle guide. (CIVCO, Kalona, IA)

Discussion and Results

The study's primary end point was to observe the patient complication rate with a secondary end point evaluating the number of core needle biopsy passes required to provide enough glomeruli for adequate processing for diagnosis. Observing the change of process from a two-person method of biopsy, one imaging and one performing the procedure, to a one-person approach using a needle guide also provided evidence this approach saves time and is cost-effective by reducing the additional fee for utilizing a Radiologist.

Group 1, using a 2-person free-hand technique, had 95 major complications (6.3%) and 101 minor complications (6.7%). More than 2 passes were required to yield adequate specimens in 33% of the cases. Conversely, Group 2 utilizing a single-person technique with Ultra-Pro II needle guide had 13 major complications (2.1%) and 17 minor complications (2.7%). Only 14.5% of the cases required more than 2 passes for adequate specimens.

Results show the overall complication rate is 3.04 times less when using the Ultra-Pro II needle guide and a single-person technique. Additionally, the yield of the biopsy was significantly greater using a needle guide.

Conclusions

The authors conclude a renal biopsy performed using a single-person technique, with real-time ultrasound guidance and Ultra-Pro II needle guide is associated with:

- Lower complication rate
- Decreased procedure time
- Better tissue sample yield
- Decreased cost to the patient.

Author Commentary

"In this study, we observed that the post-biopsy major complications were three times higher with USG imaging and needle tracking without needle guide. Not only the yield and adequacy with a larger number of Glomeruli and proportionately lower number of inadequate biopsies was observed with needle guide, but the number of passes and complications were also significantly less with the use of needle guide."

"Real-time USG (ultrasound-guided) imaging supported by needle guide device is associated with better biopsy yield and fewer complications."

