The Efficacy of Real-Time Ultrasound-Guided Versus Blinded Percutaneous Renal Biopsy

Wanjak Pongsittisak¹  
Naphat Wutilertcharoenwong¹  
Sathit Kurathong¹  
Tanun Ngamvichchukorn¹  
Chutima Chavanisakun²  
Surazee Prommool¹

¹Division of Nephrology, Department of Medicine, Faculty of Medicine, Navamindradhiraj University, Bangkok 10300, Thailand, ²Department of Pathology, Faculty of Medicine, Navamindradhiraj University, Bangkok 10300, Thailand

Background: Renal biopsy is a useful diagnostic procedure. Two techniques are blind percutaneous renal biopsy (B-Bx) and real-time ultrasound-guided percutaneous renal biopsy (R-Bx). The B-Bx is the procedure that ultrasound is used to identify kidney and mark the needle-introducing site at the skin. Then, the biopsy needle is introduced pass through the skin at the marked site into the kidney and rechecked by observing respiratory movement of the needle. Whereas, the difference of R-Bx from B-Bx is that ultrasound is used to identify needle and kidney while introducing needle. Nevertheless, there were few publications that compared efficacies and complications of 2 techniques.

Objective: To compare the efficacy of real-time ultrasound-guided vs blinded percutaneous renal biopsy.

Methods: We retrospectively reviewed renal biopsy database in terms of patient characteristics, number of glomeruli, adequate tissue, and complications. The term of adequate tissue was categorized into completely and essentially adequate tissues. The completely adequate tissue was defined as biopsy tissue that obtained more than 20 glomeruli and at least 2 vessels for native kidney, or at least 10 glomeruli and at least 1 vessel for transplant kidney. The essentially adequate tissue was defined as biopsy tissue with at least 10 glomeruli and at least 1 vessel for native kidney, or at least 7 glomeruli and at least 1 vessel for transplant kidney.

Results: During January 2014 – June 2017, we performed 246 renal biopsies. The 42 renal biopsies were excluded because of incomplete data. The 208 renal biopsies were 100 B-Bx and 104 R-Bx. The number of transplant renal biopsies were 19 (19%) for B-Bx and 16 (15.4%) for R-Bx. The baseline characteristics of both groups were comparable. The mean number of total glomeruli from R-BX was significantly more than B-Bx (20.8 ± 12.1 vs 16.0 ± 12.9, p = 0.001). The R-Bx obtained adequate tissues more than B-BX in terms of the completely adequate tissue (46.2% vs 24%, p = 0.001) and the essentially adequate tissue (76% vs 44%, p < 0.001). Moreover, sixteen renal biopsies (16%) from B-Bx obtained inadequate tissues for pathological diagnosis. The bleeding complications of R-Bx and B-BX were 12.5% and 7%, respectively. However, the complications were not statistically different (p = 0.187). There were no patients needed to do embolization or nephrectomy in both groups.

Conclusion: In comparison with B-Bx, the R-Bx could obtain more tissue adequacy and number of glomeruli. While the complications of both groups are comparable. Hence, the real-time ultrasound-guided percutaneous renal biopsy is a favorable technique.

Keywords: Renal biopsy, Real-time ultrasound-guided, Blinded renal biopsy