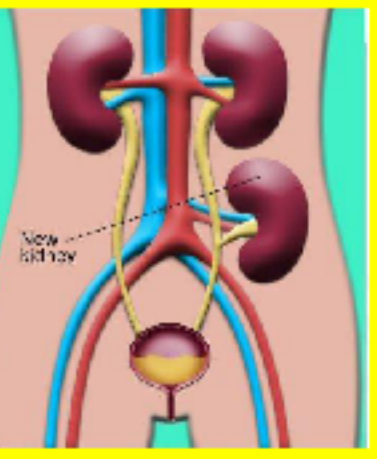


Ultrasound Guided Percutaneous Renal Biopsy with Ultra Pro Needle Guide by Nephrologist Decreases Post Biopsy Complications

Shashi Kumar¹, Narayan Prasad¹, Raj K. Sharma¹, Amit Gupta¹, Anupama Kaul¹, Dharmendra Bhadauria¹, Heera Lal², manoj jain³, Vinita Agarwal³

Department of Nephrology¹, Radiology² & Pathology³

Sanjay Gandhi Postgraduate Institute of Medical Sciences, Lucknow, India



Introduction

Renal biopsy is an indispensable tool in the diagnosis, prognosis and management of patients with renal diseases.

With the use of real-time USG and automated biopsy needles the general safety and complication rate of the procedure have considerably improved.

Nevertheless, renal biopsy can cause serious complications.

However, the most recent advances with the use of Ultra pro needle guide may further improve the yield and decreased the complication rate.

Aim of Study

To analyze the predictors and to compare the biopsy yield and complications rate of USG guided percutaneous renal biopsy with using ultra pro needle guide by nephrologists themselves.

Objective

To look for

- Comparison of biopsy yield and complication rate with use of Ultra Pro Needle Guide
- Incidence of complication
- Predictors of complication

Material and Method

Study Design: Single tertiary centre prospective observational study.

Study Period: April 2004 to March 2013

Study Population: Group A: Biopsy done without Ultra Pro needle guide between April 2004 to December 2010 (n=1510)

Group B: Biopsy done with ultra Pro needle guide between January 2011 to March 2013 (n=628)

Results

Demographic Profiles and Clinical characteristics

Characteristics	Total patients (mean±SD)	With major complication	Without major complication	p value
Number of patients	2138	108	2030	
Age (years)	35.65±15.56	31.97±15.92	35.84±15.52	.012
Systolic blood pressure (mmHg)	120.71±6.25	125.78±7.22	120.45±6.08	<0.001
Diastolic blood pressure (mmHg)	82±4.65	84.35±3.86	81.88±4.63	<0.001
Hemoglobin (g/dl)	11.14±1.40	10.11±1.77	11.20±1.35	<0.001
Platelet count (10 ³ /cmm)	247.12±65.43	213.71±85.19	248.89±63.75	<0.001
INR	1.05±0.13	1.11±0.12	1.05±0.12	<0.001
Sr. Creatinine (mg/dl)	2.58±1.92	4.03±2.26	2.51±1.87	<0.001
eGFR (ml/min)	50.50±36.95	32.13±31.01	51.47±36.99	<0.001
Sr. albumin (g/dl)	2.96±0.45	2.88±0.71	2.97±0.43	.064
No. of glomeruli	15.38±6.24	14.25±5.44	15.44±6.28	.053

Clinical characteristics between two groups

Characteristics	First period Without ultra pro guide	Second period With ultra pro guide	P value
Number of patients	1510	628	
Age (years)	35.52±15.49	35.95±15.73	0.56
Systolic blood pressure	120.76±6.05	120.76±6.73	0.853
Diastolic blood pressure	82.01±4.64	81.99±4.67	0.937
Hemoglobin (g/dl)	11.14±1.41	11.17±1.38	0.558
Platelet count	245.20±63.4	253.95±67.7	0.139
INR	1.06±0.11	1.05±0.11	0.146
Sr. creatinine (mg/dl)	2.62±1.96	2.49±1.82	0.508
eGFR	50.40±37.48	50.72±35.66	0.140
No. of glomeruli	14.14±6.01	17.98±6.75	0.001
Major complications	95(6.7%)	13(2.1%)	0.001

The indications of kidney biopsy are nephrotic syndrome 950 (44.4%), RPGN 491 (23%), graft dysfunctions 361 (16.9%), acute kidney injury in 152 (7.1%), nephritic syndrome in 117 (5.5%), acute on chronic kidney disease in 36 (1.7%), and multiple myeloma 31 (1.4%)

Of all the 2138 patients, 226 (10.5%) patients developed 118 (5.4%) minor and 108 (5.1%) major complications. Only 13 (2.1%) major complications were observed during the second period while 95 (6.7%) major complication were observed in the first period (p< 0.001).

The mean number of glomeruli per biopsy was 17.98±6.75 during the second period was significantly greater than 14.14±6.01 glomeruli obtained during the first period. (P=0.004).

Odd ratios for post biopsy complication

Complication during biopsy	With needle guide	Without needle guide	Odds ratio (95% CI)	P value
None +Minor	615	1415	3.04	
Major	13(2.1%)	95(6.3%)	(1.74-6.19)	0.001
Total	628	1510		

On Univariate analysis, systolic and diastolic blood pressure, serum creatinine, eGFR, haemoglobin, platelet count, coagulation profile, use of needle guide was significant predictors of major complications

On multivariate analysis, platelet count and INR lost the significance.

Cox regression analysis for predictors of complication

Multivariate analysis	Odds ratio	95%CI	P value
Systolic BP (per 10 mmHg)	1.10	1.07-1.15	<0.001
Diastolic BP (per 10 mmHg)	1.09	1.04-1.15	<0.001
eGFR (per 10 ml/min)	0.98	0.97-1.00	0.02
Sr. creat (per mg/dl)	1.42	1.20-1.69	<0.001
Hemoglobin (per g/dl)	0.73	0.55-0.96	0.02
Platelet count (per 10 ³ /cmm)	0.99	0.99-1.00	0.09
INR (per 0.1 increase)	1.87	0.32-10.78	0.48
Ultra-pro needle guide (Vs no guide)	0.26	0.13-0.49	<0.001

Conclusion

- Kidney biopsy complications are less if biopsy, USG and needle tracking with ultra pro needle guide are performed by nephrologists compared to biopsy performed by nephrologists with USG done by radiologist
- Ultra pro needle guide improves the yield and decreases complication



- Systolic and diastolic blood pressure, serum creatinine, eGFR, haemoglobin, platelet count and use of needle guide was significant predictors of major complications
- The optimal observation period post biopsy is 24 hours.

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