

RENAL MASS BIOPSY VS. BIOPSY OF MASSES IN OTHER ORGANS: WHY IS IT DIFFERENT ONLY FOR THE KIDNEY?



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INTRODUCTION

In urology, renal mass biopsy among patients with an image-detected small renal mass (i.e. ≤ 4 cm) is currently not the standard of care; instead, most urologists proceed with extirpative therapy despite the knowledge that 20% of these masses are benign. For all other solid, organ-confined masses (e.g. prostate, bladder, lung, breast, etc.), the standard of care mandates a biopsy-established diagnosis prior to treatment. In order to discern why the kidney is an outlier for pre-treatment biopsy, we sought to compare the efficacy and safety of renal mass biopsy to biopsy of a mass in other major solid organ systems.

METHODS

We reviewed meta-analyses, systematic reviews, and clinical studies (Table 1) with regard to biopsy of a mass in the following organs: breast, lung, pancreas, liver, thyroid, prostate, and kidney. Rigorous study designs that minimized bias and systematic error were identified; only reports dealing exclusively with needle biopsy were included.

RESULTS

Table 1. Literature Review

Organ	Author	Year	Number of Studies	Number of Patients
Breast	Dahabreh et al.	2014	316	69,804
Lung	DiBardino et al.	2015	75	33,306
Pancreas	Puli et al.	2013	41	4,766
Thyroid	Suh et al.	2016	28	4,580
Liver	Müllhaupt et al.	2011	5	822
Prostate	Wegelin et al.	2016	20	3,239
Renal	Marconi et al.	2016	57	5,228

Table 2. Global Organ Biopsy Results

Organ	Diagnostic Accuracy	Sensitivity	Specificity	Complication Rate	Pre-treatment Biopsy Rate
Breast	96%	99%	97%	<2%	100%
Lung	92%	92%	100%	21%	100%
Pancreas	88%	87%	96%	6%	100%
Thyroid	96%	91%	99%	<1%	100%
Liver	86%	84%	100%	1.5%	100%
Prostate	68%	83%	96%	50%*	100%
Renal**	96%	99%	98%	8%*	7%

*Clavien grade ≥ 2 accounted for <4% for both prostate and renal biopsy

**Sensitivity, specificity, diagnostic accuracy, and pre-treatment biopsy rate for small renal masses (i.e. ≤ 4 cm)

RESULTS

- The sensitivity and specificity for biopsy of a small renal mass were 99% and 98%, respectively, while the sensitivity and specificity for needle biopsy in the other organs ranged from 48% - 99% and 96% - 100%, respectively (Table 2).
- The complication rate for renal mass biopsy was 8% (less than 1% of these were Clavien grade ≥ 2), and the diagnostic accuracy (i.e. concordance with surgical pathology) of small renal mass biopsy was 96%.

CONCLUSION

The safety and efficacy for needle biopsy of a small renal mass provides results equal to or better than biopsy of a solid mass in any other organ system prior to definitive therapy.

