A Comparison Of Wedge And Needle Kidney Biopsies

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Study Design

- Greater than 25 glomeruli
- The percentage of obsolete glomeruli
- The percentage of tubular interstitial scarring
- The percentage of arterial intimal fibrous narrowing
- The assessment of ATN, inflammation, etc.

This study was performed on 182 kidneys that were recovered by other OPOs and were accepted for transplantation by the NYODN area transplant centers.

The analyzed time period: March 2007-April 2008

On each of these kidneys the personnel of the organ recovering OPO performed wedge biopsy.

When kidneys arrived to the NYODN, the preservation technician performed needle biopsy according to the NYODN protocol, prior to placing kidney on the LifePort.
We compared results of wedge and needle biopsies performed on the same kidney. Both biopsies have been read by the same renal pathologist at Mt. Sinai Hospital, New York.

This research study did not meet our institutions criteria for protection of human subjects.

Summary of the Proposed Needle Biopsy Technique

1. The use of a 14 G needle
2. The needle angle is 15 to 20 degrees to the kidney
3. The needle's stylet (inner part) is opened prior to the needle insertion. The technician triggers the needle when the stylet cover comes in contact with the kidney capsule, so the cut of the core started from the kidney capsule and included the complete glomerular layer.
4. Obtain two 14 G cores per kidney
5. The biopsy sites are closed with a “Figure 8” stitch.


Comparison of Wedge and Needle Biopsies

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<thead>
<tr>
<th>Glomeruli Wedge Biopsy</th>
<th>Glomeruli Needle Biopsy</th>
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<tbody>
<tr>
<td>Mean glomeruli yield: 53.67 ± 36.76</td>
<td>Mean glomeruli yield: 45.53 ± 24.25</td>
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<td>Median: 46.5 (Range 2 – 214)</td>
<td>Median: 41 (Range 0 – 150)</td>
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Comparison of Wedge and Needle Biopsy

Wedge Biopsy

- Glomeruli
- Sclerosed
- ATN

Needle Biopsy

- Glomeruli
- Sclerosed
- ATN

Number of Collected Glomeruli

- 80.8% (n=147) of those with Wedge biopsy had a yield of >25 glomeruli
- 78.0% (n=142) of those with Needle biopsy had a yield of >25 glomeruli

- Overall yield between wedge and needle biopsy is not statistically significant (p=0.517).

Percent of Obsolete Glomeruli

- There is no statistically significant difference between wedge and needle biopsy in finding obsolete glomeruli (p=0.2664)
There was a statistically significant difference in finding tubular interstitial scarring between wedge and needle biopsy with needle biopsy reporting significantly more scarring ($p<0.001$ by Fisher’s exact test).

There was a statistically significant difference in vascular narrowing between wedge and needle biopsy with needle biopsy reporting significantly more narrowing ($p<0.001$).

There is no significant difference in Acute Tubular Necrosis between wedge and needle biopsy ($p=0.8710$).
Conclusion

- These data suggest that adequate kidney allograft assessment of glomerular yield >25 can be obtained safely with two 14 gauge biopsy cores, if taken at the proper angle and sutured.
- Needle biopsy has the ability to detect more tubular interstitial scarring as well as vascular narrowing.
- Due to irregular distribution of glomerular volumes within different cortical zones it is practical to perform two cores NB with cores obtained from upper and middle poles.

Thank you!

Questions?