SCIENTIFIC REGISTRY OF TRANSPLANT RECIPIENTS

Impact of Incorporating Donor Kidney Biopsy in Kidney Yield And Posttransplant Outcomes

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Disclosures

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I have no financial relationships to disclose within the past 12 months relevant to my presentation.

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Background

- The gap between the demand for and supply of kidneys for transplant continues to grow
- Expansion of the donor pool could maximize deceased donor kidney utilization
- Kidneys that are discarded due to biopsy findings, especially for glomerular sclerosis (GS), represent a significant source of underutilization. However, the association of kidney biopsy findings and outcomes is not fully understood
- We sought to investigate the impact of incorporating GS on kidney yield and recipient outcomes using two Scientific Registry of Transplant Recipients (SRTR) models, deceased donor yield models and program specific report (PSR) models

Methods

- Study cohort and data source:
  - Data source: SRTR database
  - Donor cohort used for yield model
    - Study period: 7/1/2017 to 6/30/2019
    - 32,109 deceased donor kidneys were transplanted, and 11,009 kidneys were discarded (from 21,599 deceased donors)
    - 11,071 donors had 1 or 2 kidneys biopsied, and 10,488 donors had neither kidney biopsied (from 21,599 deceased donors)
  - Transplant cohort:
    - Study period: 1/1/2016 to 6/30/2018
    - Recipient cohort used for PSR Model: 30,985 deceased donor kidney transplant recipients received 32,109 kidneys, of which 8467 were biopsied

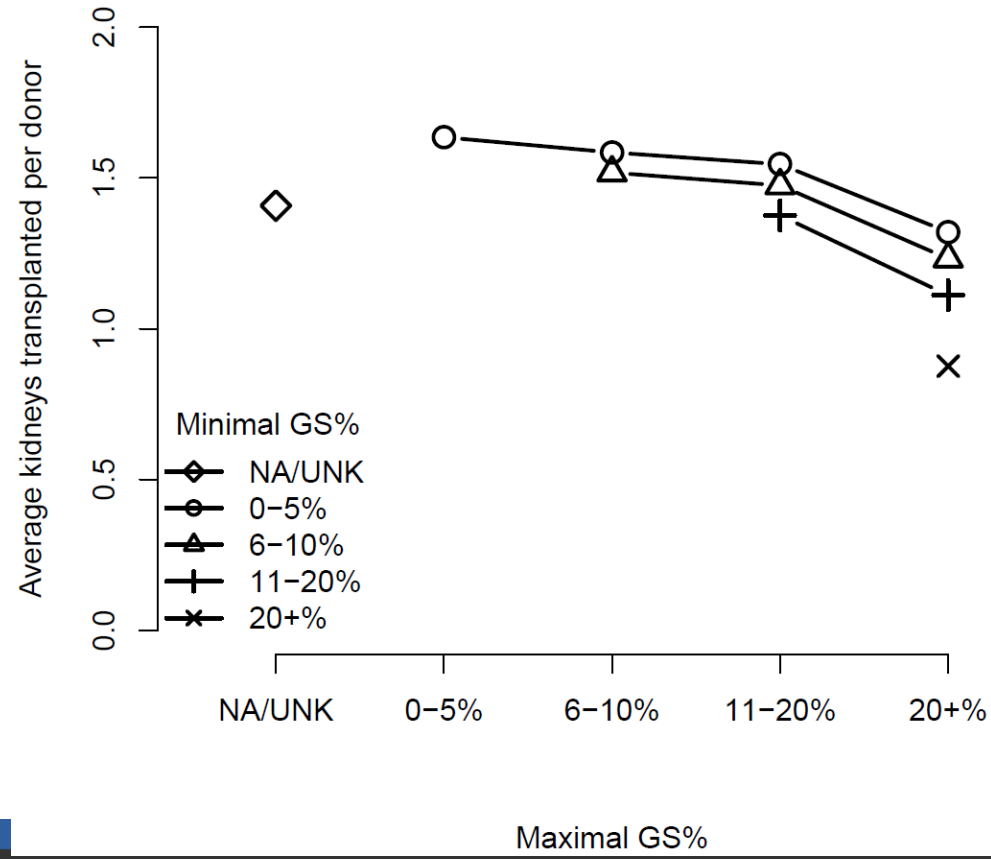
Methods

- Statistical analysis
  - Yield model (multivariable multinomial regression): In most cases, two kidneys from one donor were biopsied, yielding minimal GS and maximal GS, both of which were included in the model to study the association between GS and kidney yield at the OPO level
    - Average number of kidneys transplanted per donor was estimated in a counter-factual framework—in other words, the average number of kidneys if each donor had the given combination of minimal and maximal GS
  - PSR model (multivariable Cox regression): Recipients' outcomes depended on the performance of the "better kidney" in cases of en-bloc transplant; thus, minimal GS was included in the PSR model to study the associations between GS and 1-year posttransplant graft and patient survival
  - Both models used the least absolute shrinkage and selection operator (LASSO)

Results – Association of GS and kidney yield

Donor characteristics	n = 21559
Age	41 ± 17
Sex (% of male)	60.5%
Race	
White	79.8%
Black	16.2%

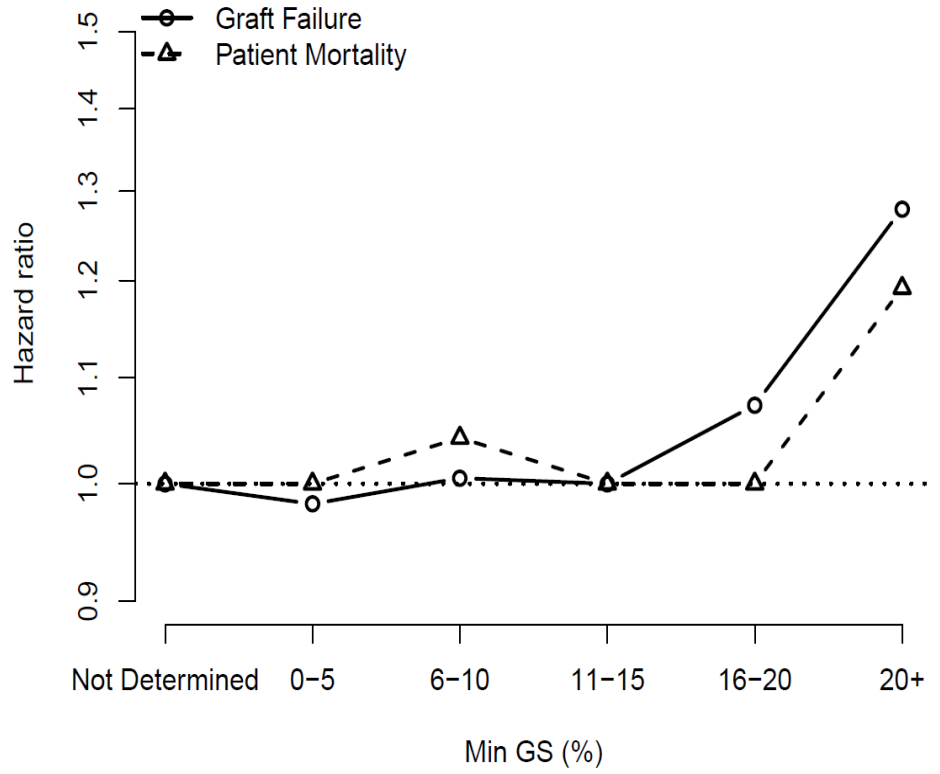
Minimal GS	Maximal GS NA/UNK	Maximal GS 0-5%	Maximal GS 6-10%	Maximal GS 11-20%	Maximal GS >20%
NA/UNK	10488 (48.6%)	0 (0.0%)	0 (0.0%)	0 (0.0%)	0 (0.0%)
0-5%		5912 (27.4%)	1325 (6.1%)	443 (2.1%)	150 (0.7%)
6-10%			653 (3.0%)	661 (3.1%)	172 (0.8%)
11-20%				548 (2.5%)	465 (2.2%)
>20%					742 (3.4%)



Results – Associations of GS and recipients outcomes

Recipient characteristics	n = 30985
Age	52.0 ± 13.0
Sex (Female)	% 40.5
Race	
White	56.1%
Black	34.2%

Minimal GS	Maximal GS NA/UNK	Maximal GS 0-5%	Maximal GS 6-10%	Maximal GS 11-20%	Maximal GS >20%
NA/UNK	15,119 (48.79%)	0 (0.0%)	0 (0.0%)	0 (0.0%)	0 (0.0%)
0-5%		11,607 (37.46%)	31 (0.10%)	19 (0.06%)	3 (0.01%)
6-10%			2,408 (7.77%)	26 (0.09%)	6 (0.02 %)
11-20%				1,332 (4.30%)	33 (0.11 %)
>20%					400(1.29 %)



Conclusions

- Increased GS was associated with lower organ yield
- Increased GS was associated with poorer posttransplant graft and patient survival
- SRTR has incorporated GS into both the deceased donor yield model and the PSR model since January 2020, attempting to encourage OPOs to procure, and transplant centers to use, kidneys with higher levels of GS with the assurance that their performance will not be affected

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