

# Correlation of Coronary Anatomy and Interventions with Acute and Long-Term Post-Renal Transplantation Outcomes

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## Background:

- Chronic kidney disease (CKD) is prevalent and an established atherosclerotic cardiovascular disease risk enhancer<sup>1</sup>
- Renal transplant improves quality of life, saves money, decreases mortality by 48-82%, and projected years of life increase from 10 to 20 compared to staying on the waiting list<sup>2</sup>
- Pre-transplant workup to screen for coronary disease is mostly by consensus from published practice turned into guidelines<sup>3</sup>
- After catheterization, unclear what to do with coronary angiography data

## Objective:

- Correlate coronary anatomy with clinical outcomes after renal transplantation

## Methods:

- A database of consecutive renal transplant recipients between May, 2009 and May 2018 at VCU with a cardiac catheterization within the preceding five years was created
- Divided by coronary anatomy: no coronary artery disease (CAD), mild CAD with stenosis <70%, obstructive CAD with subsequent revascularization, and obstructive CAD without complete revascularization
- Primary outcome defined as postoperative composite adverse event of myocardial infarction, urgent revascularization, new reduction in left ventricular ejection fraction, hemodynamic instability, and 30-day patient death or graft loss

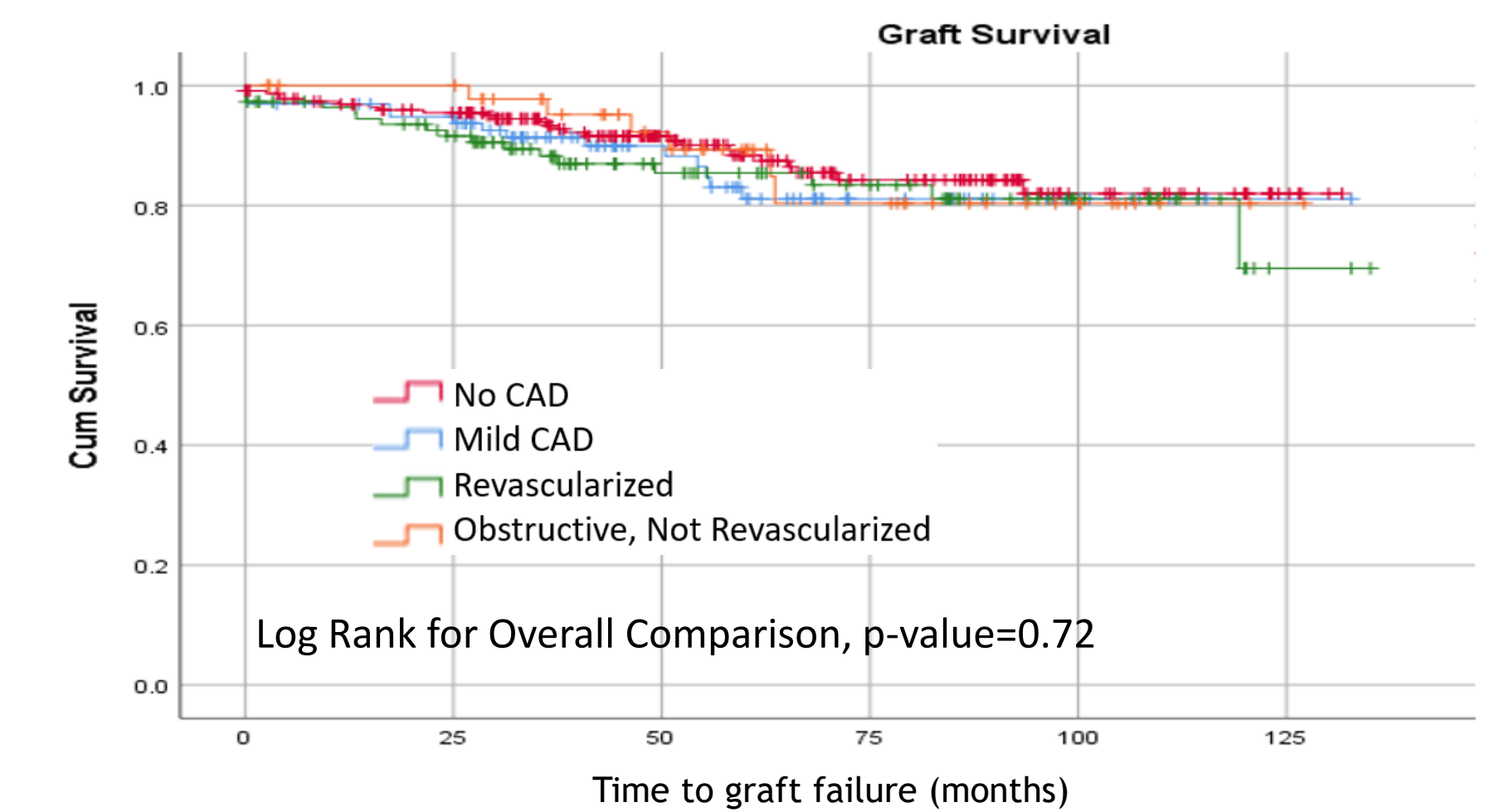
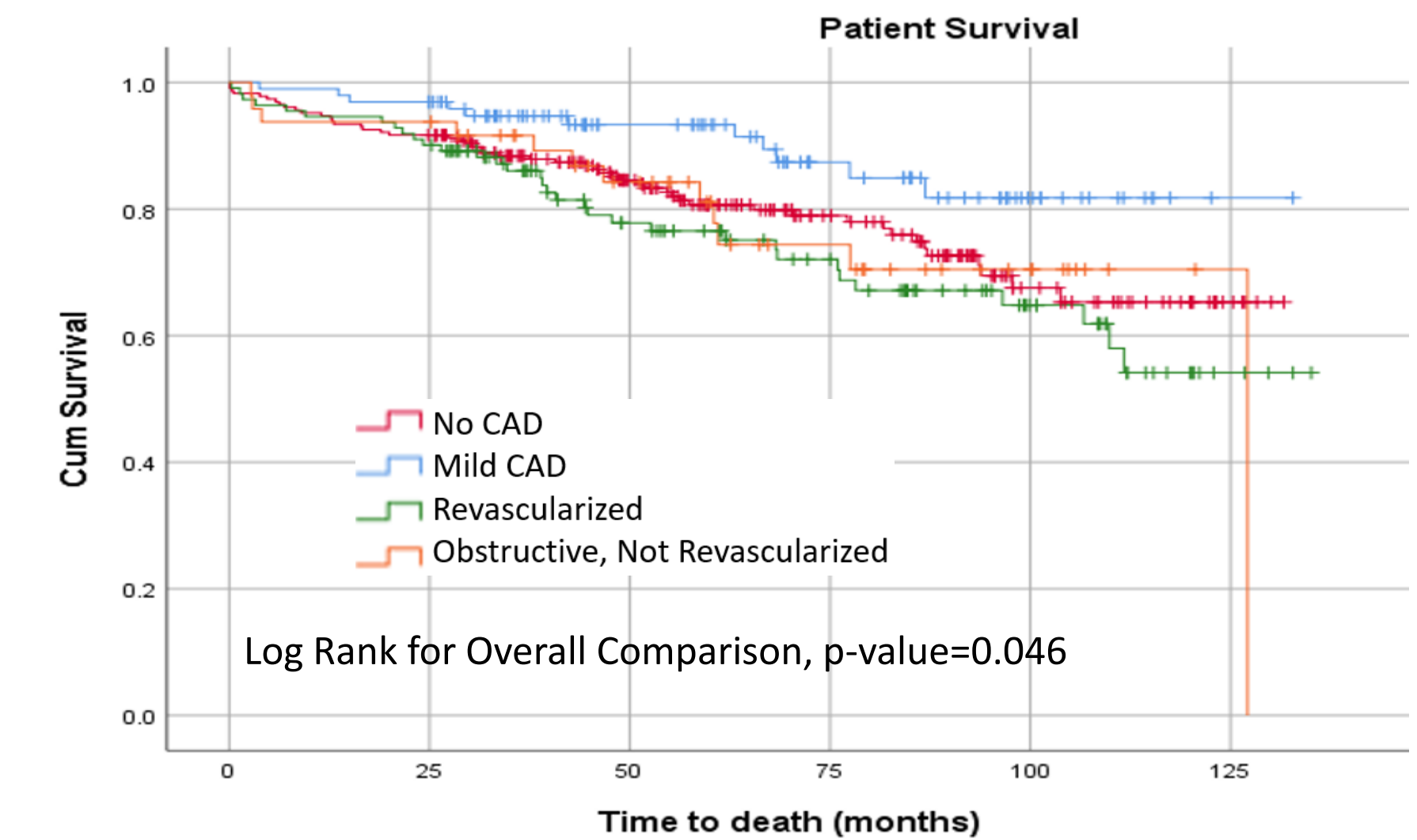
## Results:

| Table 1: Demographics               | Overall Population | Coronary Anatomy Subgroups |           |                |                                 | P-Value |
|-------------------------------------|--------------------|----------------------------|-----------|----------------|---------------------------------|---------|
|                                     |                    | No CAD                     | Mild CAD  | Revascularized | Obstructive, Not Revascularized |         |
| Variable                            |                    |                            |           |                |                                 |         |
| Number                              | 484                | 97                         | 228       | 111            | 48                              |         |
| Age (years)                         | 56±11              | 51±12                      | 57±11     | 57±10          | 58±8.6                          | 0.00    |
| Male Sex                            | 312 (64%)          | 51 (53%)                   | 145 (64%) | 82 (74%)       | 34 (71%)                        | 0.01    |
| Diabetes Mellitus                   | 295 (61%)          | 43 (44%)                   | 128 (57%) | 83 (75%)       | 41 (85%)                        | 0.00    |
| BMI (kg/m <sup>2</sup> )            | 29±4.8             | 30±5.3                     | 29±4.9    | 29±4.4         | 29±4.2                          | 0.88    |
| History of MI                       | 25 (5%)            | 7 (7%)                     | 4 (2%)    | 10 (9%)        | 4 (8%)                          | 0.01    |
| Severe Valvular Dysfunction         | 9 (2%)             | 0                          | 4 (2%)    | 3 (3%)         | 2 (4%)                          | 0.30    |
| Ejection Fraction (%)Pre-Transplant | 57±9.1             | 55±11                      | 59±7.8    | 55±8.6         | 54±11                           | 0.01    |
| Warm Ischemia Time (minutes)        | 33±7.3             | 33±5.9                     | 34±8.2    | 33±7.2         | 34±5.8                          | 0.50    |
| Cold Ischemia Time (hours)          | 16±10.1            | 15±9.2                     | 16±10     | 16±10          | 14±11                           | 0.72    |
| Living Donor                        | 104 (21%)          | 14 (14%)                   | 54 (24%)  | 20 (18%)       | 16 (33%)                        | 0.04    |
| Extended Criteria Donor             | 0.59±0.26          | 0.52±0.26                  | 0.59±0.27 | 0.63±0.26      | 0.62±0.25                       | 0.047   |
| Total Cholesterol (mg/dL)           | 157±46             | 161±46                     | 160±48    | 152±45         | 149±44                          | 0.34    |
| Triglycerides (mg/dL)               | 148±105            | 143±97                     | 149±101   | 148±103        | 149±141                         | 0.80    |
| HDL (mg/dL)                         | 42±13              | 45±15                      | 42±14     | 42±12          | 41±12                           | 0.47    |
| LDL (mg/dL)                         | 85±35              | 87±33                      | 87±36     | 81±37          | 82±36                           | 0.24    |

Table 1 gives the demographic, pre-transplant data for the study population. All continuous variables are displayed as mean ± standard deviation. Categorical variables are reported as number (percentage). P-values are reported for difference between the four coronary anatomy subgroups.

| Table 2: Clinical Outcome                      | Overall Population | Coronary Anatomy Subgroups |           |                |                                 | P-Value |
|--|--------------------|----------------------------|-----------|----------------|---------------------------------|---------|
|  |                    | No CAD                     | Mild CAD  | Revascularized | Obstructive, Not Revascularized |         |
| Outcome  |                    |                            |           |                |                                 |         |
| Number   | 484                | 97                         | 228       | 111            | 48                              |         |
| Composite Primary Outcome                      | 52 (11%)           | 11 (11%)                   | 23 (10%)  | 14 (13%)       | 4 (8.3%)                        | 0.84    |
| Death Within 30 Days                           | 5 (1.0%)           | 0                          | 4 (1.8%)  | 1 (0.9%)       | 0                               | 0.44    |
| Graft Loss Within 30 Days                      | 8 (1.7%)           | 3 (3.1%)                   | 2 (0.9%)  | 3 (2.7%)       | 0                               | 0.31    |
| Myocardial Infarction Urgent Revascularization | 12 (2.5%)          | 3 (3.1%)                   | 2 (0.9%)  | 5 (4.5%)       | 2 (4.2%)                        | 0.17    |
| Newly Reduced EF Hemodynamic Instability       | 9 (1.9%)           | 1 (1.0%)                   | 1 (0.4%)  | 5 (4.5%)       | 2 (4.2%)                        | 0.036   |
|  | 0                  | 0                          | 0         | 0              | 0                               | N/A     |
|  | 30 (6.2%)          | 5 (5.2%)                   | 15 (6.6%) | 7 (6.3%)       | 3 (6.3%)                        | 0.97    |

Table 2 gives the main outcomes of the study. The composite primary outcome was a combination of patient death with 30 days of transplantation, graft loss within 30 days, myocardial infarction during hospitalization for transplantation, urgent revascularization during hospitalization for transplantation, new reduction in ejection fraction (EF) during hospitalization for transplantation, and hemodynamic instability requiring inotrope or pressor support outside of the operating room. Each component of the primary outcome is given individually. Patient and graft survival are also given at the time points of 30 days, 1 year, 3 years, and 5 years with the number of patients with data at the specified time points.



In multivariate analysis, coronary anatomy did not predict primary outcome, but increasing age (p=0.04) and severe valvular dysfunction (p=0.02) did.

## Conclusion:

These data suggest that clinical evaluation in a population with a high burden of coronary disease and frequent intervention can result in good transplant outcomes acutely, but long-term patient survival is still affected by coronary artery disease.

**Disclosures:** Todd Teigeler has nothing to disclose

## References:

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