# The Surgical Outcomes of Root Replacement in Genetic Aortopathy

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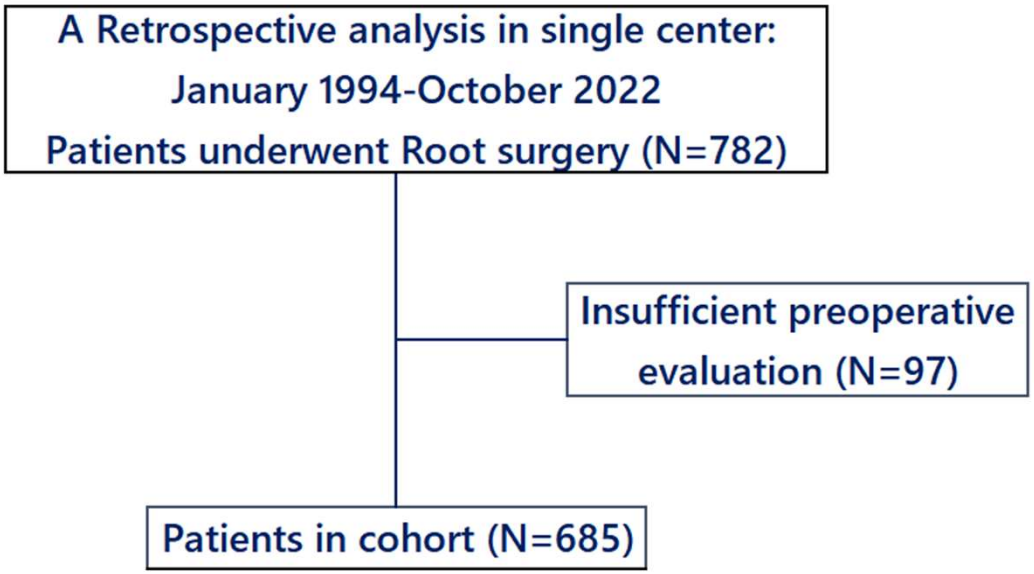
# Introduction

- Valve-sparing root reimplantation (VSRR) has shown outcomes comparable to the Bentall operation for root replacement, yet the discrepancy in their efficacy in genetic aortopathy remains unclear.

- This research aims to explore if the benefits of VSRR as a root replacement persist in the context of genetic aortopathy.

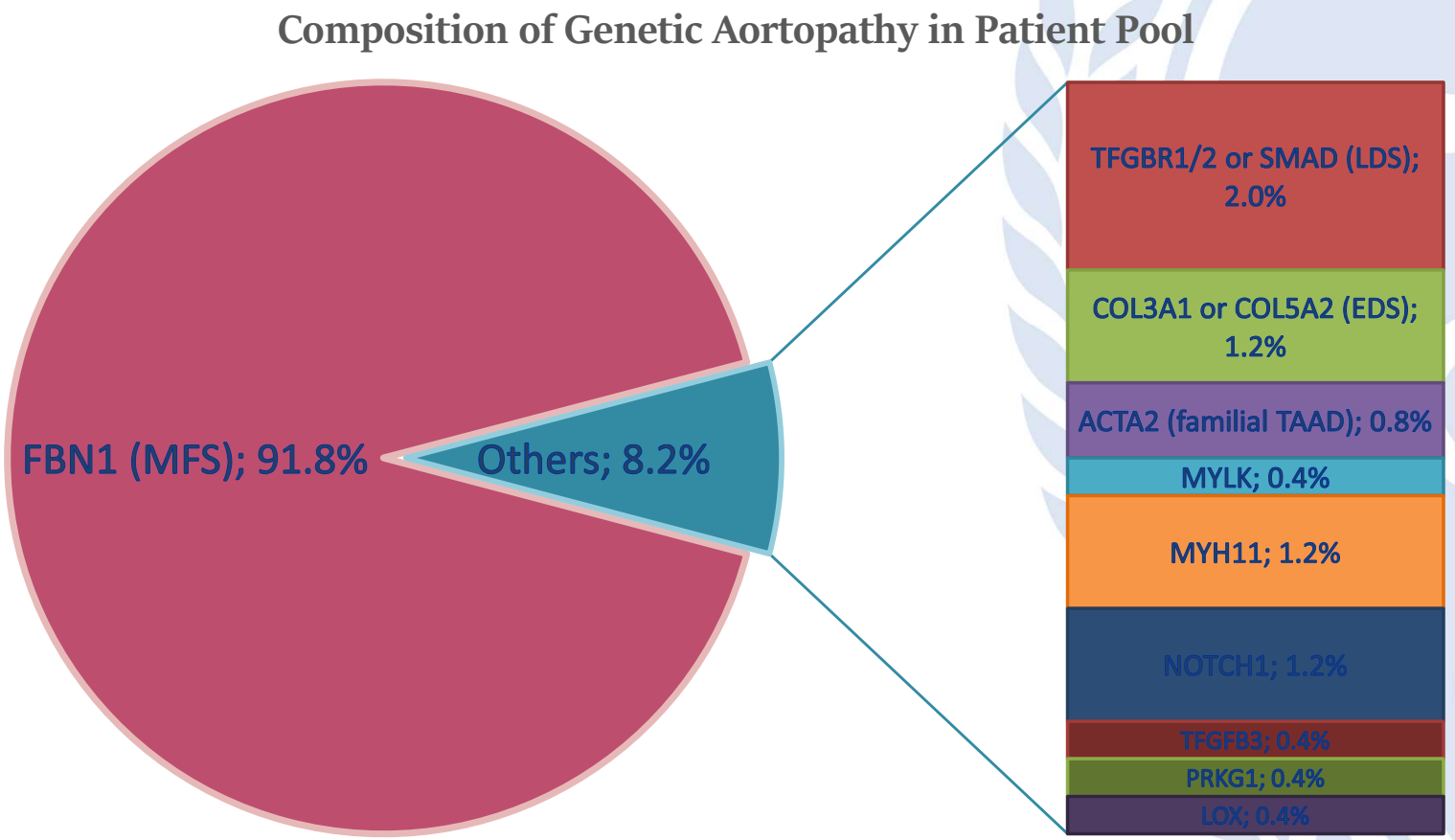
# Methods




- Cox models analyzed the association between perioperative variables and long-term outcomes.
- Among genetic aortopathy cohorts, IPTW balanced covariates, comparing clinical outcomes across root replacement types.
- Subgroup analyses focused on the interaction between root replacement types and genetic aortopathy.

Abbreviations; IPTW: Inverse Probability of Treatment Weighting.

# Composition of Genetic Aortopathy in Patient Pool



# Patients characteristics

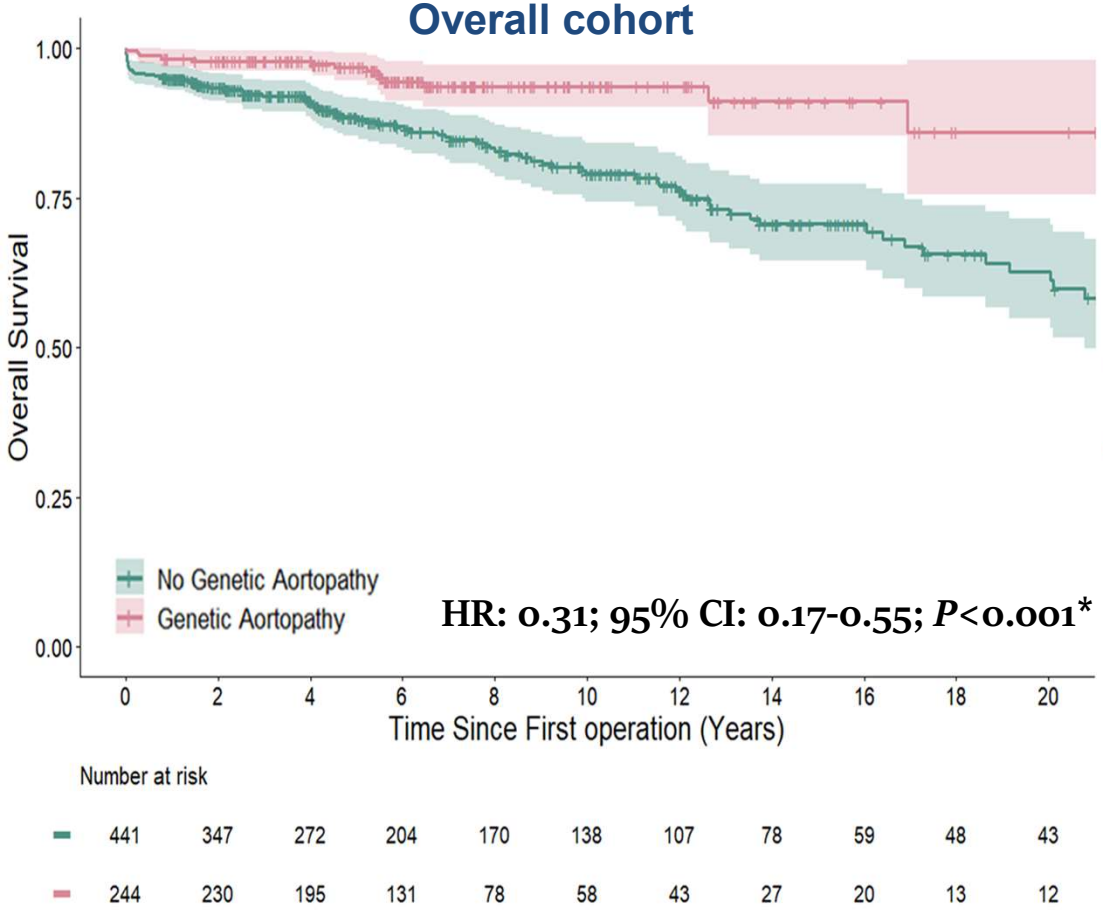
**Table 1. Analysis of Baseline Characteristics in Genetic Aortopathy**

| Characteristics | | Genetic aortopathy | | |
|---|---|---|---|---|
| | | Yes | No | |
| | | 244 | 441 | p value |
| Age (mean±SD) | | 42.9±13.8 | 57.1±13.9 | <0.001* |
| Female (n(%)) | | 174 (71.3) | 337 (76.4) | 0.168 |
| Hypertension (n(%)) | | 69 (28.3) | 230 (52.2) | <0.001* |
| Type 2 Diabetes (n(%)) | | 10 ( 4.1) | 24 ( 5.4) | 0.554 |
| End stage renal disease (n(%)) | | 1 ( 0.4) | 6 ( 1.4) | 0.431 |
| History of stroke (n(%)) | | 7 ( 2.9) | 29 ( 6.6) | 0.057 |
| History of coronary artery disease (n(%)) | | 8 ( 3.3) | 55 (12.5) | <0.001* |
| Previous cardiac surgery (n(%)) | | 33 (13.5) | 48 (10.9) | 0.367 |
| Atrial fibrillation (n(%)) | | 7 ( 2.9) | 48 (10.9) | <0.001* |
| Preoperative Echocardiographic Data | | | | |
| Bicuspid valve (n(%)) | | 21 ( 8.6) | 50 (11.3) | 0.321 |
| EF (%) (mean±SD) | | 54.9±10.8 | 53.9±10.6 | 0.261 |
| Aortic regurgitation (n(%)) | | | | <0.001* |
| | None to trivial | 39 (16.0) | 15 ( 3.4) | |
| | Mild | 17 ( 7.0) | 17 ( 3.9) | |
| | Moderate | 16 ( 6.6) | 12 ( 2.7) | |
| | Severe | 172 (70.5) | 397 (90.0) | |
| Operation | | | | |
| Emergent operation (n(%)) | | 23 ( 9.4) | 40 ( 9.1) | 0.987 |
| Types of root surgery (n(%)) | | | | 0.999 |
| | VSRR | 119 (48.8) | 148 (33.6) | |
| | Mechanical Bentall operation | 119 (48.8) | 212 (48.1) | |
| | Tissue Bentall operation | 6 ( 2.4) | 81 (18.4) | |

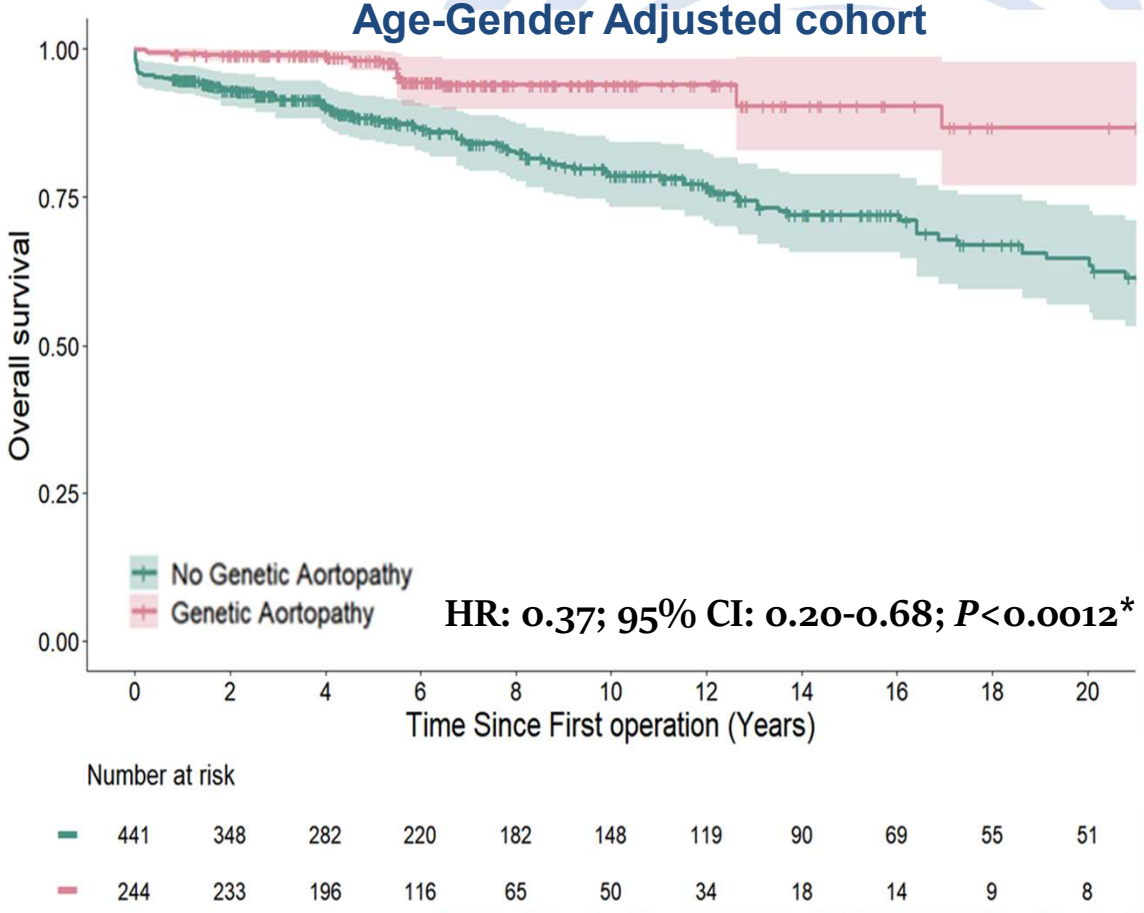
Abbreviations; SD, standard deviation; EF, Ejection fraction; VSRR, Valve-sparing root replacement.

# Overall Survival in Cohorts following Root Replacement

## Overall cohort




## Age-Gender Adjusted cohort

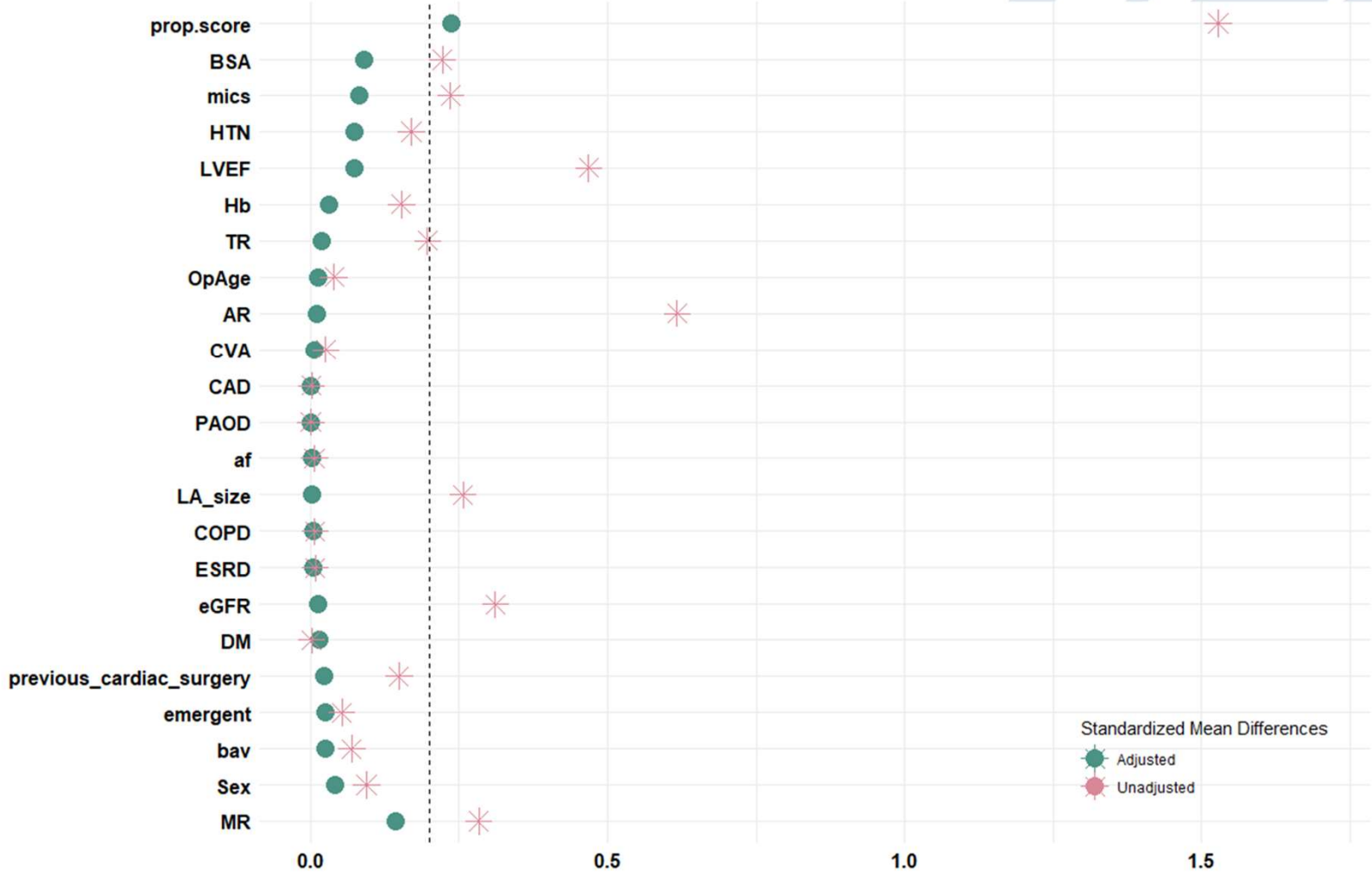



Clinical outcomes after Root Replacement in Overall Cohorts

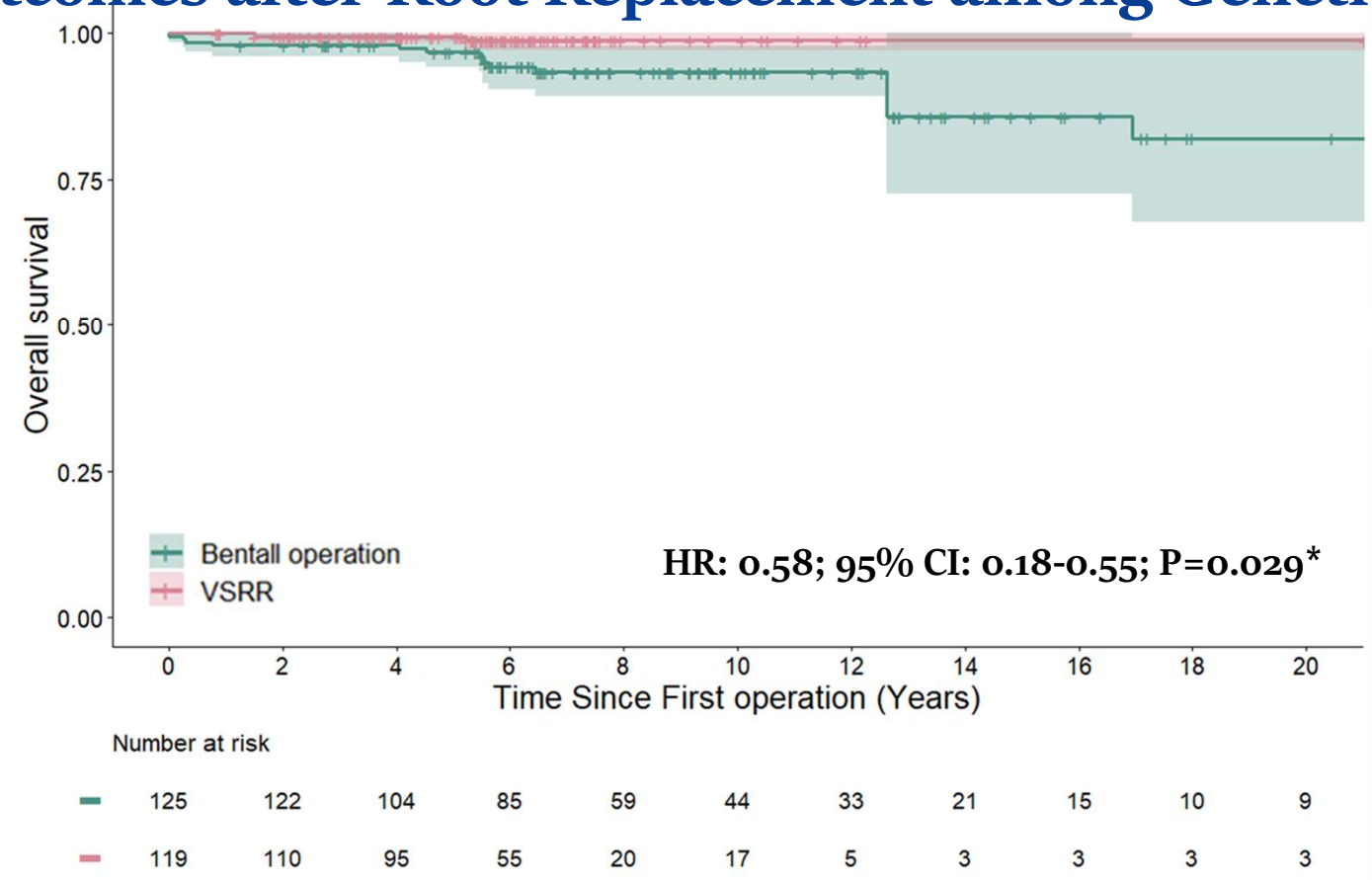
| | Infective Endocarditis | Stroke | Hemorrhagic Event | Reopration |
|---|---|---|---|---|
| HR (95% CI) | 0.58 (0.19 - 1.79) | 0.87 (0.45 - 1.70) | 0.47 (0.22 - 0.99) | 1.84 (1.04 - 3.25) |
| p value | 0.333 | 0.686 | 0.042* | 0.034* |

Abbreviations:
HR: Hazard Ratio;
CI: Confidence Interval.

# IPTW Covariate Balance in Root Replacement Types Among Genetic Aortopathy Cohorts



# Clinical outcomes after Root Replacement among Genetic Aortopathy

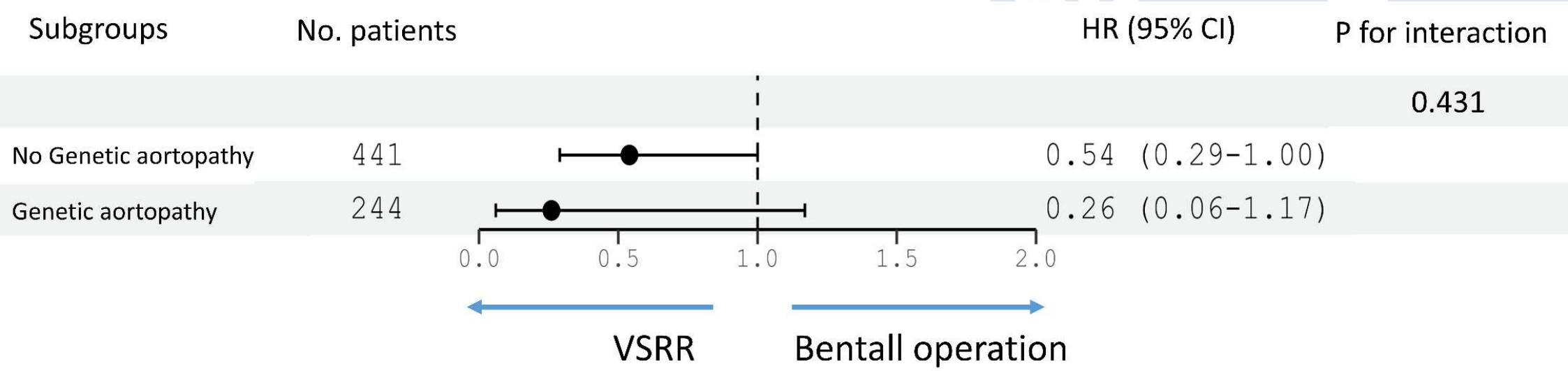



Clinical outcomes after Root Replacement in Genetic Aortopathy

| | Infective Endocarditis | Stroke | Hemorrhagic Event | Reopration |
|---|---|---|---|---|
| HR (95% CI) | 0.47 (0.05 - 4.34) | 0.66 (0.20 - 2.13) | 0.13 (0.02 - 1.09) | 3.96 (1.62 - 9.64) |
| p value | 0.502 | 0.484 | 0.06 | 0.002* |

Abbreviations: HR: Hazard Ratio; CI: Confidence Interval.

# Subgroup analyses: Interaction on All-cause Mortality of Root Surgery Types and Genetic Aortopathy




The favorable outcomes of VSRR over the Bentall operation persisted consistently **across both the genetic and non-genetic cohorts** (p for interaction=0.431).

Abbreviations; HR: Hazard Ratio; CI: Confidence Interval; VSRR, Valve-sparing root replacement.

# Conclusion

- In patients undergoing root replacement, long-term outcomes were more favorable with genetic aortopathy.

- Patients with genetic aortopathy who underwent VSRR showed superior survival outcomes compared to those who underwent Bentall operation.