



HEART TRANSPLANT OUTCOMES FOR PATIENTS WITH CARDIAC SARCOIDOSIS

Grace Liu, M.D.

Eugene DePasquale, M.D.

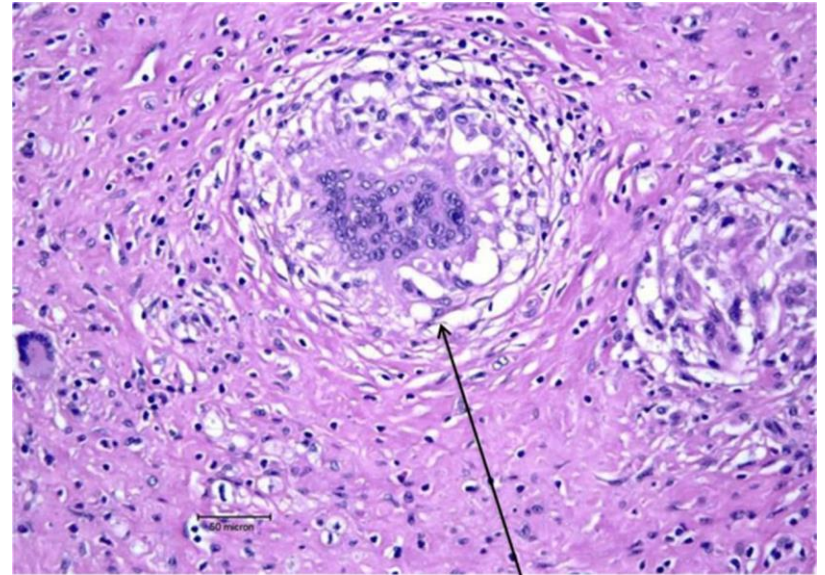
Ajay Vaidya, M.D.

Author Disclosures

- None

Background

- **Sarcoidosis** is a heterogeneous disorder of unknown etiology whose signature lesions are **noncaseating granulomas**
- Most commonly in the lungs and lymph nodes, but can appear in virtually any organ

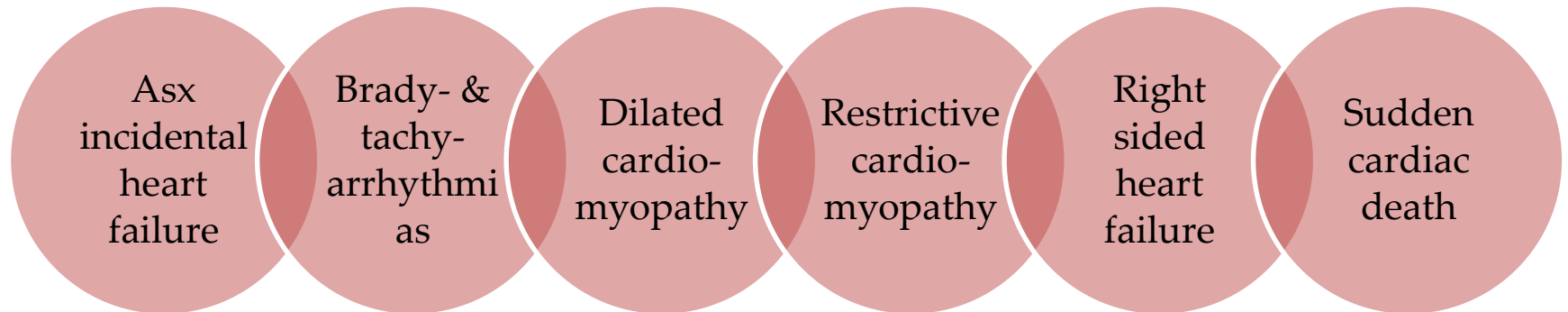


Granuloma

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Background

- **Cardiac sarcoidosis (CS)** is a progressive infiltrative cardiomyopathy which varies in presentation on clinical spectrum



Background

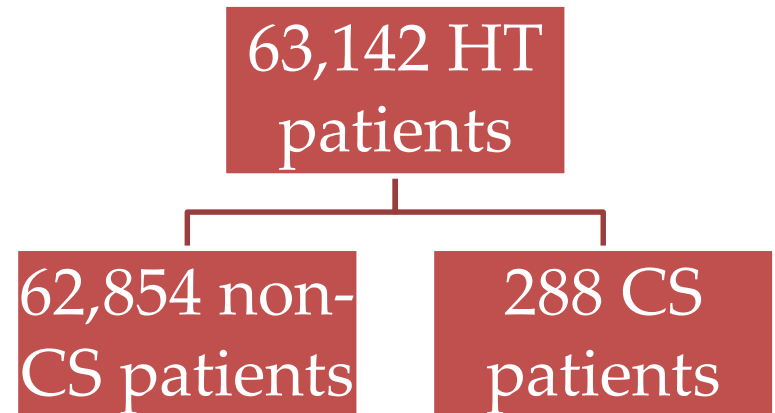
- High rates of adverse events and poor prognosis
 - Five-year survival of 10% if untreated
 - Five-year survival of 75% in glucocorticoid-treated patients
- Despite concerns about sarcoid recurrence in the cardiac allograft and progression of disease in other organs, favorable outcomes have been demonstrated in HF patients transplanted with CS

Objectives

- Evaluate the long-term heart transplant outcomes of patients with cardiac sarcoidosis (CS) as compared to those without CS from large national registry

Methods

- United Network Organ Sharing (UNOS) registry database
- 1987 – 2019
- Differences in baseline characteristics between CS and non-CS end-stage HF patients assessed
- Survival compared using multivariate Cox proportional hazard regression analysis



Results – Baseline Characteristics

Characteristics	Non –CS (N = 62,854)	CS (N = 288)	P value
Recipient age – year (mean \pm SD)	46.6 \pm 19.2	52.4 \pm 9.0	< 0.001
Recipient female sex – no. (%)	16,460 (26.2%)	103 (35.8%)	< 0.001
Race – no. (%)			< 0.001
White	45,498 (72.4%)	196 (68.1%)	
Black	10,355 (16.5%)	77 (26.7%)	
Hispanic	4730 (7.5%)	7 (2.4%)	
Other	2,271 (3.6%)	8 (2.8%)	
Diabetes mellitus – no. (%)	10,648 (20.6%)	43 (15.4%)	0.03
Dialysis dependent – no. (%)	1020 (1.6%)	3 (1.0%)	0.44
Smoking – no. (%)	20,788 (33.1%)	71 (24.7%)	0.002
Prior non-transplant cardiac surgery – no. (%)	11,529 (18.3%)	35 (12.2%)	0.007
Donor age – year (mean \pm SD)	28.2 \pm 14.0	32.1 \pm 11.8	< 0.001

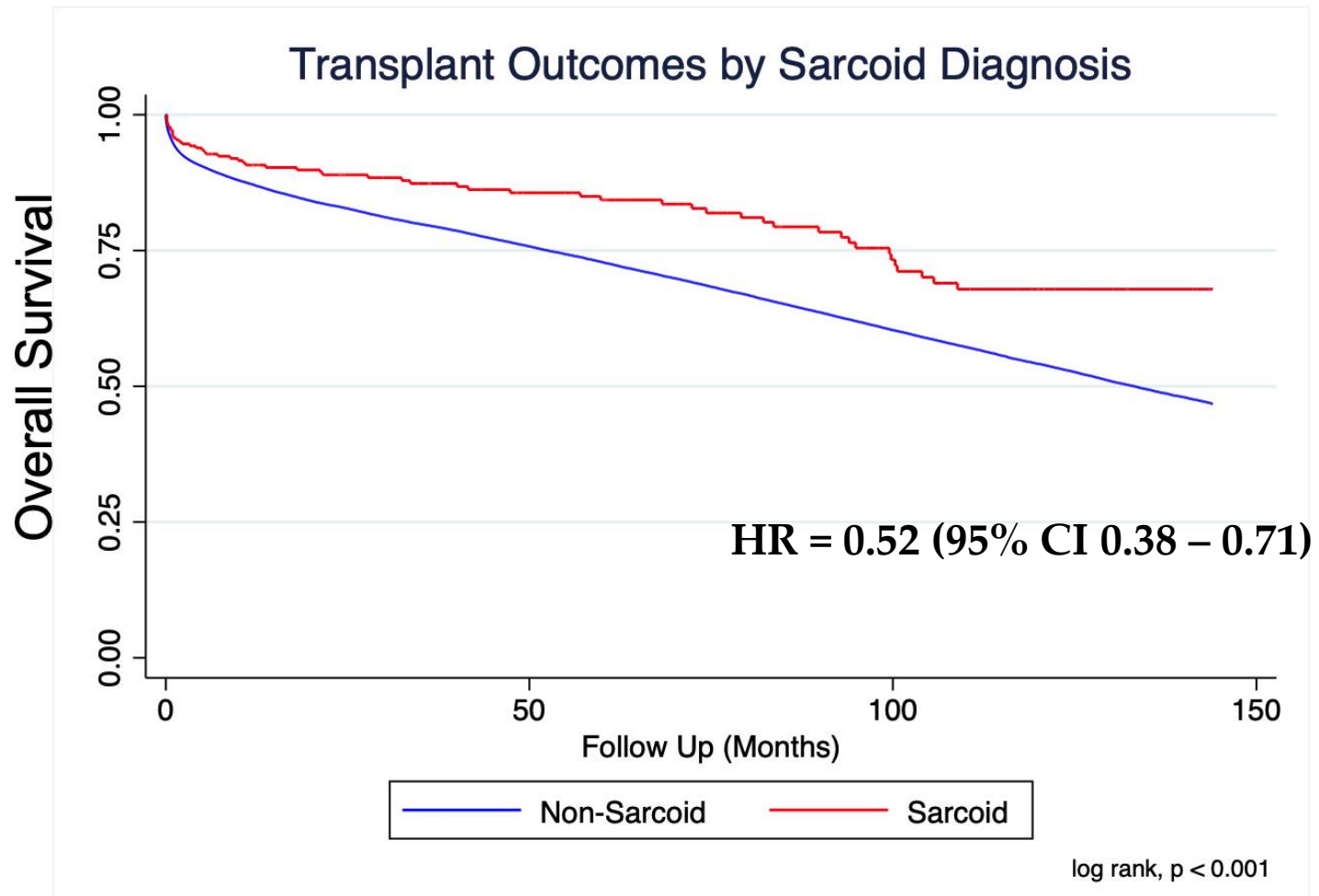
Results – Characteristics at Time of Transplant

Characteristics	Non – CS (N = 62,854)	CS (N = 288)	P value
Serum Creatinine	1.2 +/- 1.0	1.3 +/- 0.5	0.36
Ischemic Time – no. (%)			0.43
0 – 1 h	9437 (15.6%)	46 (16.3%)	
2 - < 3 hr	18,744 (30.9%)	88 (31.2%)	
3 - < 4 hr	21,148 (34.9%)	106 (37.6%)	
≥ 4 hr	11,278 (18.6%)	42 (14.9%)	
PA systolic – mm Hg, mean ± SD	41.6 ± 14.9	34.9 ± 13.1	< 0.001
PA diastolic – mm Hg, mean ± SD	20.3 ± 8.9	17.0 ± 7.3	< 0.001
PA mean – mm Hg, mean ± SD	28.2 ± 10.5	24.0 ± 9.2	< 0.001
PCWP – mm Hg, mean ± SD	18.8 ± 8.9	15.9 ± 7.9	< 0.001
CO – L/min, mean ± SD	4.4 ± 1.5	4.2 ± 1.4	0.013

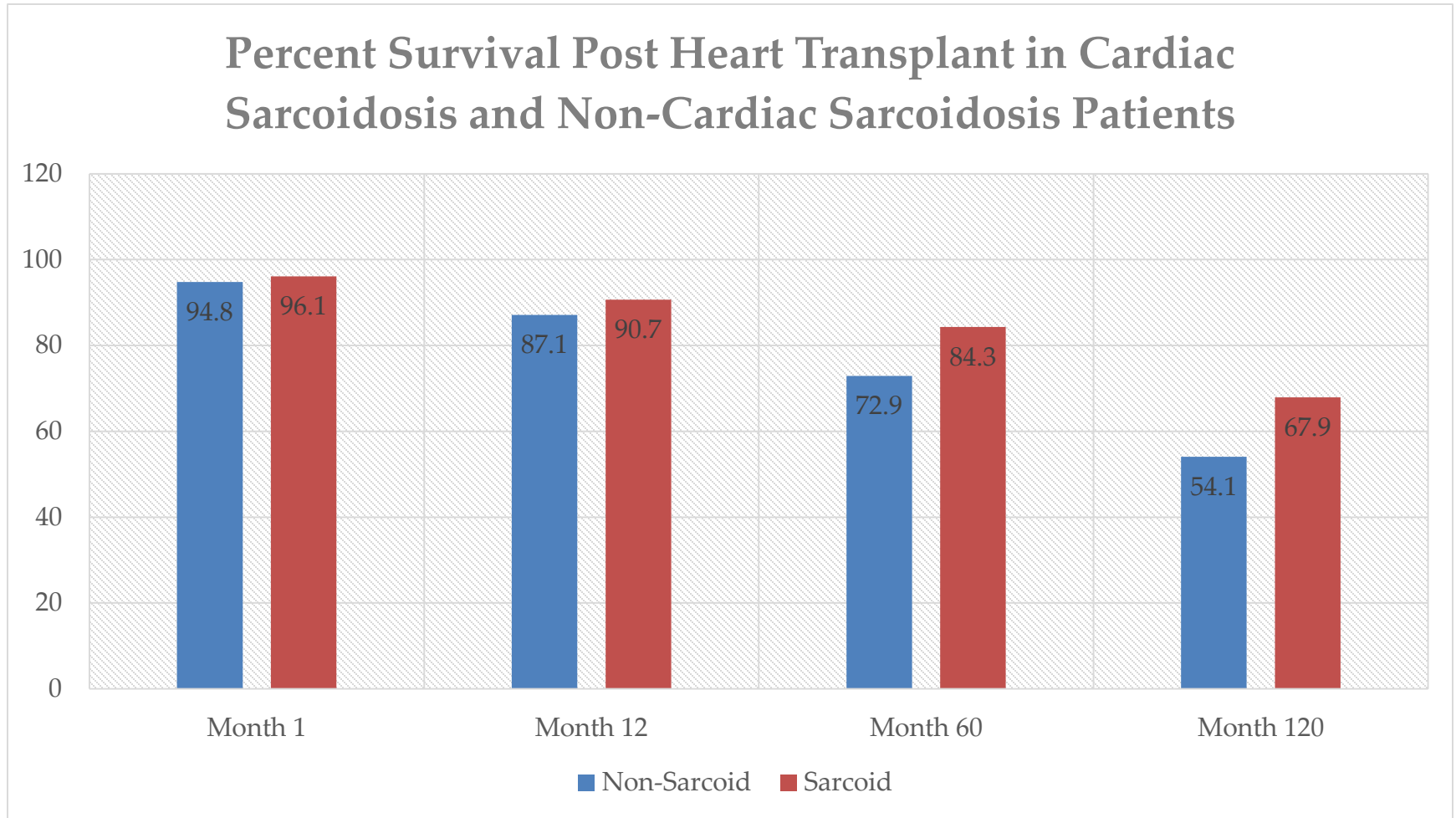
Results – Characteristics at Time of Transplant

Characteristics	Non – CS	CS	P value
Requirement for ventilator, mechanical circulatory support, and/or inotropes – no. (%)	40,602 (64.7%)	201 (69.8%)	0.071
Intra-Aortic Balloon Pump	3,477 (5.5%)	18 (6.2%)	0.59
Ventricular Assist Device	15,751 (25.0%)	79 (27.4%)	0.35
Mechanical Ventilator	2680 (4.3%)	1 (0.3%)	0.001
Total Days on Waiting List (including inactive time) – median (IQR)	83.0 (26.0, 230.0)	88.0 (27.0, 235.0)	0.65
Wait List Status – no. (%)			< 0.001
Status 1	47,774 (79.3%)	237 (88.8%)	
Status 2	11,697 (19.4%)	30 (11.2%)	
Inactive	804 (1.3%)	0 (0.0%)	
Cardiovascular cause of death	10,252 (32.3%)	18 (29.0%)	0.58

Survival Outcomes



Survival Outcomes



Adjusted Multivariate Cox proportional hazards regression analysis

Variable	Hazard Ratio	95% Confidence Interval	
Cardiac Sarcoidosis	0.52	0.38	0.71
Ethnicity	0.90	0.85	0.96
Life Support Requirement	0.87	0.84	0.89
Dialysis at Time of Transplant	1.73	1.57	1.91

Conclusions

- Cardiac Sarcoidosis HT recipients were:
 - *More* likely to be older and female
 - *Less* likely to have underlying comorbidities such as diabetes, tobacco use, and prior non-transplant cardiac surgery
 - Tended to receive *older* donors

Conclusions

- At the time of HT, cardiac sarcoidosis patients were:
 - Less likely to require mechanical ventilation
 - Had similar rates of mechanical circulatory support (IABP, VAD, ECMO)
- The median time on the wait list was similar between both groups, but there was a lower overall post-transplant mortality in the sarcoid HT recipients which was evident even after 10-year follow-up

Conclusions

- Our work supports the current practice that the diagnosis of sarcoidosis should not disqualify potential HT candidates
- Cardiologists and physicians in general should have a low threshold for diagnostic testing and work-up if cardiac sarcoidosis is suspected



Thank You!