Poster Session -- Poster session 1

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CMR assessment of right ventricular-pulmonary arterial coupling and right ventricular trabecular complexity: impact on prognosis in patients undergoing lung transplant assessment

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Right ventricular (RV) function is prognostic in pulmonary hypertension (PH), but key metrics are unclear. We correlated a CMR index of RV-pulmonary arterial (PA) coupling, as well as RV trabecular complexity by its fractal dimension (FD) to prognosis.

84 patients underwent lung transplant assessment and CMR, with RV FD assessed using freely available code (FracAnalyse); RV-PA coupling was estimated by stroke volume (SV) / RV end systolic volume (ESV) ratio.

Median follow up was 19.33 ± 17.17 months; 94% of the patients had underlying lung disease. 51 of 66 patients had echo-detected PH. Survival was predicted by SV/ESV, RVEF, indexed RV end-diastolic (EDVi) and ESVi, and mPAP on univariate analysis. Both SV/ESV and RV FD correlated to mPAP, right atrial (RA) area, RVEDVi and RVESVi.

In patients referred for transplant assessment, RV functional adaptation to afterload on CMR predicted survival on univariate analysis. Fractal analysis of RV trabecular complexity correlated with metrics influencing RV remodelling and contractility.

		All patients (n = 84), mean/ median	SEM/ IQR	Alive (n = 70), mean/ median	SEM/ IQR	Dead (n = 14), mean/ median	SEM/ IQR	Alive vs dead p value	Hazard Ratio	Confidence interval	p value
CMR LVEDVi		58	23	59	24	57	19	0.93			
CMR LVESVi		22	13	21	13	25	13	0.30			
CMR LVEF		62	1.07	63	1.14	58	2.77	0.06			
CMR RVEDVi		72	32	70	28	83	62	0.01	1.03	1.01, 1.04	<0.005
CMR RVESVi		41	2.62	37	2.06	64	10.14	0.02	1.03	1.01, 1.04	<0.005
CMR RVEF		51	18	53	15	38	17	.001	0.94	0.90, 0.97	<0.005
LGE		14		9		5		0.04	2.45	0.79, 7.61	0.12
RV-PA coupling SV/ESV		1.03	0.72	1.12	0.67	0.57	0.48	.001	0.12	0.027, 0.52	<0.005
mPAP		27	11	26	10	33	23	0.04	1.05	1.01, 1.09	<0.005
Transplanted		22		15		7		0.03	2.06	0.68, 6.22	0.20
Correlation		RV EDVI	RV ESVI	RV SVI	RV EF	RA area	mPAP				
SV/ESV	r value	-0.407	-0.712	0.250	0.847	-0.231	-0.301				
	p value	<0.001	<0.001	.022	<0.001	.042	.014				

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		All patients (n = 84), mean/ median	SEM/ IQR	Alive (n = 70), mean/ median	SEM/ IQR	Dead (n = 14), mean/ median	SEM/ IQR	Alive vs dead p value	Haz-ard Ratio	Confi-dence interval	p value
Global FD	r value	.319	.303	.130	-.203	.280	.290				
	p val-ue	<0.005	.005	.238	.064	.013	.018				
Maximal Basal FD	r value	.389	.350	.226	-.196	.296	.267				
	p val-ue	<0.001	<0.005	.039	.073	.008	.030				
Mean Basal FD	r value	.401	.373	.179	-.215	.350	.297				
	p val-ue	<0.001	<0.001	.102	.050	<0.005	.016				