

Epicardial and pericardial adiposity without myocardial steatosis in Cushing's syndrome

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Objective:

Cardiovascular disease is the leading cause of death in patients with Cushing's syndrome. Cortisol excess and adverse metabolic profile could increase cardiac fat, which can subsequently impair cardiac structure and function. We aimed to evaluate cardiac fat mass and distribution in patients with Cushing's syndrome.

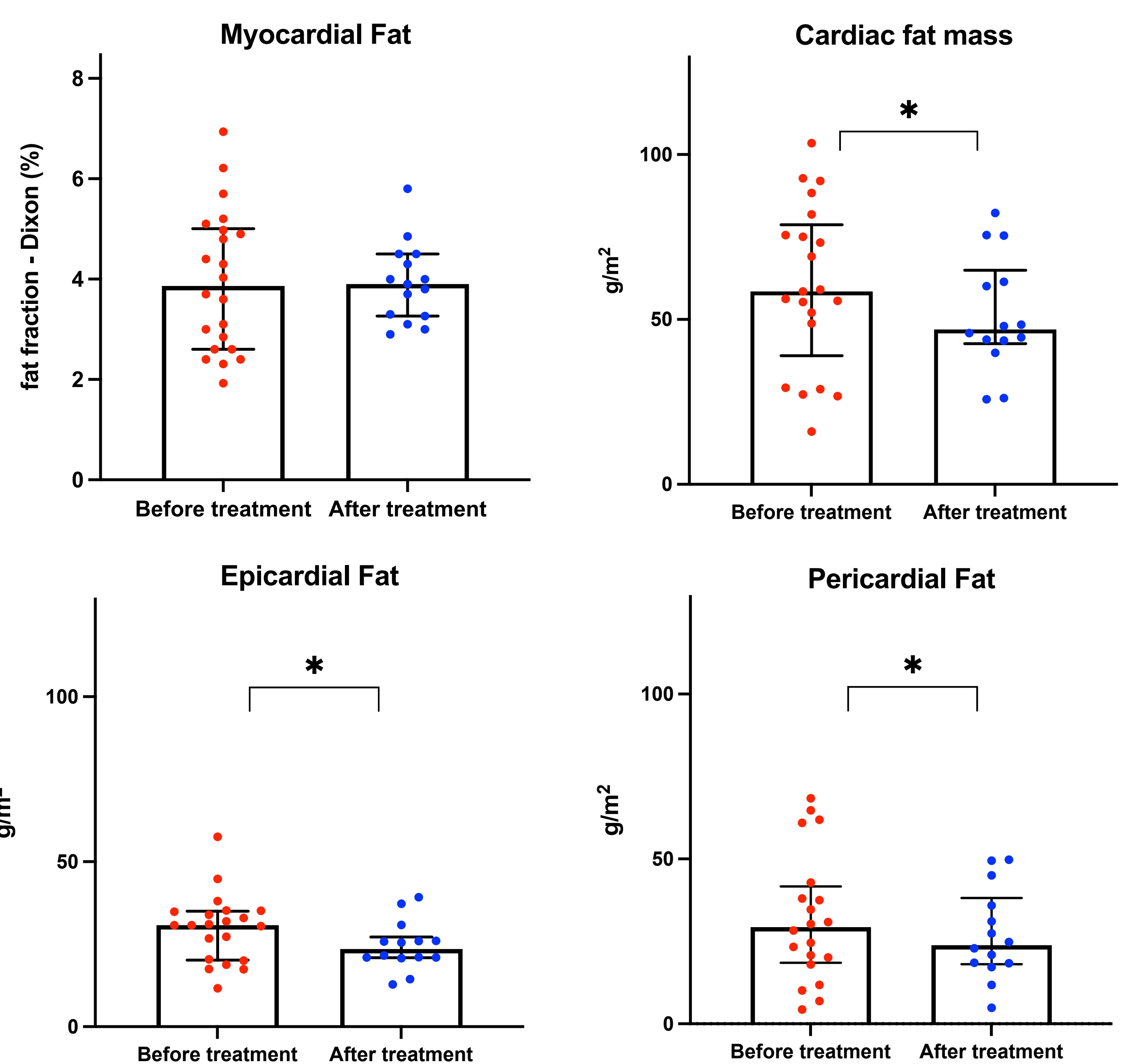
Methods:

- prospective cross-sectional study in 23 patients with Cushing's syndrome and 27 control subjects of comparable age, sex and body-mass-index
- cardiac magnetic resonance imaging and proton spectroscopy before and after biochemical disease remission
- myocardial fat measured by the Dixon method was the main outcome measure
- intramyocardial triglyceride/water ratio measured by spectroscopy and epicardial and pericardial fat volumes were secondary outcome measures

Results:

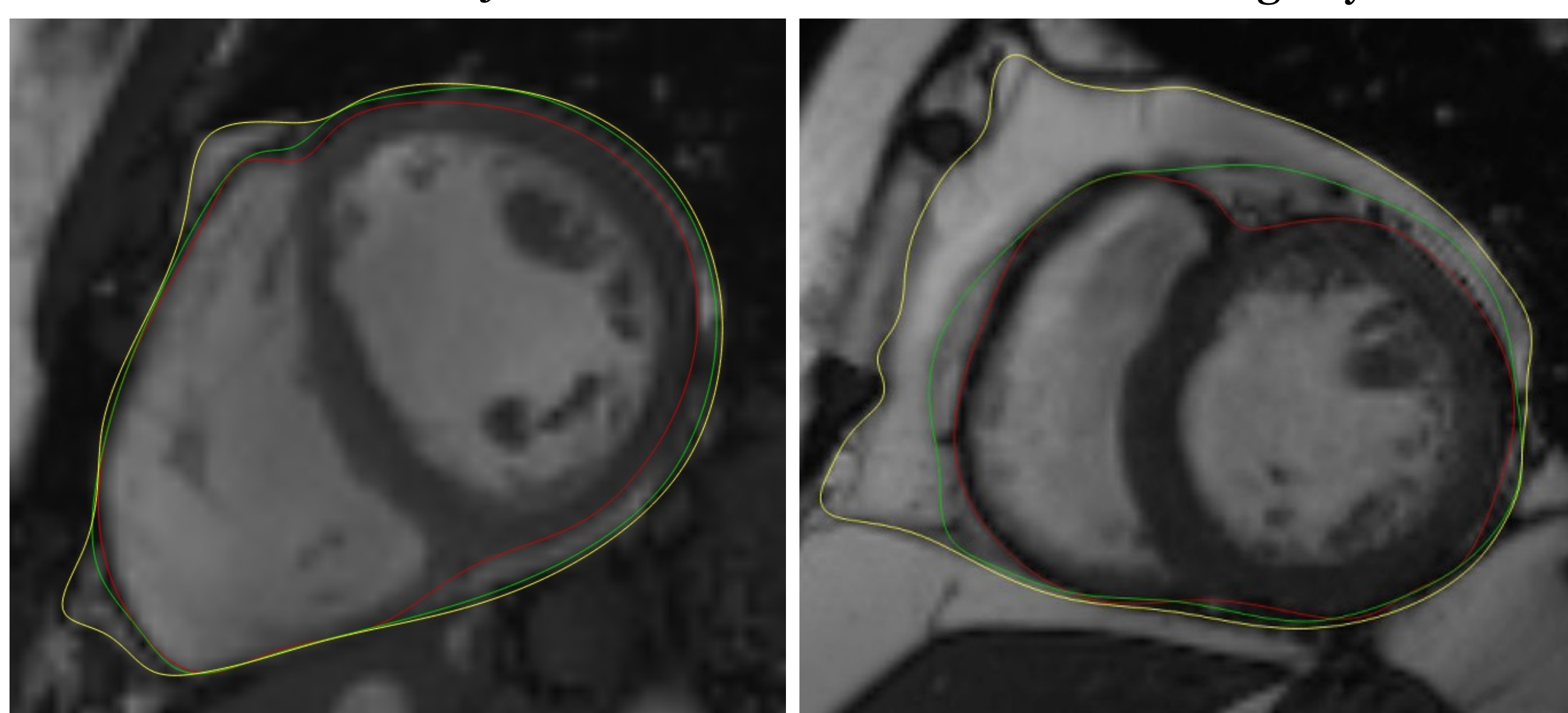
	Cushing's syndrome	Control group	p-value
End-diastolic volume index (mL/m ²)	67.5 (64.9 ; 80.8)	81.3 (73.8 ; 91.6)	0.0209
End-systolic volume index (mL/m ²)	27.3 (24.8 ; 31.6)	33.1 (27.9 ; 35.9)	0.11
Ejection fraction (%)	61.8 (56.6 ; 66.3)	61.1 (59.1 ; 62.3)	0.73
Stroke volume index (mL/m ²)	41.7 (37.1 ; 49.3)	49.4 (45.1 ; 55.6)	0.0169
Left ventricular mass index (g/m ²)	56.3 (49.3 ; 59.3)	52.1 (45.3 ; 57.4)	0.13
End-diastolic mass / volume	0.77 (0.7 ; 0.9)	0.63 (0.6 ; 0.72)	0.0014
Myocardial fat - Dixon (%)	3.9 (2.6 ; 4.9)	3.9 (3.1 ; 4.3)	0.80
Myocardial fat - spectroscopy (%)	1.8 (0.7 ; 2.9)	2.2 (1.4 ; 2.9)	0.41
Cardiac adipose tissue index (g/m ²)	58.5 (48.8 ; 87.9)	30.4 (21.9 ; 42.4)	<.001
Epicardial adipose tissue index (g/m ²)	30.8 (20.4 ; 34.8)	17.2 (13.1 ; 23.5)	<.001
Pericardial adipose tissue index (g/m ²)	28.3 (17.9 ; 38.0)	11.4 (7.5 ; 19.4)	0.0035

	Cushing's syndrome	Control group	p-value
Age (yrs)	38 (31; 52)	41 (33; 55)	0.53
Sex (Female, %)	20 (75%)	20 (75%)	NA
Body mass index (kg/m ²)	28 (24; 34)	27 (24; 32)	0.89
Systolic blood pressure (mmHg)	133 (123; 145)	120 (114; 136)	0.009
Diastolic blood pressure (mmHg)	83 (75; 90)	72 (65; 78)	0.002
HbA1c (%)	6.4 (5.7; 6.6)	6 (5.4; 6.1)	0.031
24h urinary free cortisol (ug/24h)	346 (198; 406)	29 (13; 43.3)	<0.001



Control subject

Patient with Cushing's syndrome



Discussion:

Intramyocardial fat stores are not increased in patients with Cushing's syndrome, despite highly prevalent metabolic syndrome, suggesting increased cortisol-mediated lipid consumption. Cushing's syndrome is associated with marked accumulation of epicardial and pericardial fat. Epicardial adiposity may exert paracrine proinflammatory effects promoting cardiomyopathy.