

Meeting abstract

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I103 Cardiovascular magnetic resonance assessment of epicardial fat volume: impact of weight reduction in obese males

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Introduction

Epicardial fat covers 80% of the heart and constitutes 20% of its weight. Epicardial fat and its known relationship with abdominal obesity and coronary atherosclerosis, may render this a sensitive risk predictor of adverse cardiovascular events. The aim of this study was to effectively evaluate the impact of caloric restriction and associated weight reduction on epicardial fat volume via cardiac magnetic resonance imaging (CMR).

Methods

Thirty obese male subjects (BMI > 30 kg/m²) were evaluated as a subgroup of a larger study to assess effects of weight loss on myocardial and vascular structure and function. Weight loss was induced using a low calorie diet (~800 Kcal/day) for an 8 week period. At baseline and 8 weeks, CMR short axis images (1.5 T Siemens Sonata) were taken at 10 mm intervals through the ventricles. Consecutive end-diastolic images were analysed from the mitral valve plane through to the apex and using Image Pro Plus (MediaCybernetics, Maryland) regions of epicardial fat were traced and their area calculated. A modified Simpson's rule was then used to calculate epicardial fat volume with measurements made by a blinded technician. Intra-observer variability was <5%.

Results

Subjects mean age was 44 ± 8 yrs. At baseline the cohort had a BMI of 36 ± 4 kg/m², their weight was 117 ± 20 kg and waist circumference of 122 ± 12 cm. There was a sig-

nificant reduction in both weight and waist circumference of 13% and 12% respectively (both $p < 0.01$). The baseline epicardial fat correlated with both baseline weight ($p = 0.019$) and waist circumference ($p = 0.015$). The baseline epicardial fat volume was reduced significantly by 24% from 87 ± 26 cm³ to 66 ± 23 cm³ ($p < 0.01$). An example of the epicardial fat volume reduction can be seen in the baseline image in figure 1, 'pre', compared with the same image taken after 8 weeks of caloric restriction, 'post'.

Conclusion

Epicardial fat is associated with both weight and waist circumference in the obese male. This is the first study to show a reduction in epicardial fat volume is associated with caloric restriction with further studies required to establish whether this is ultimately associated with improved myocardial function.

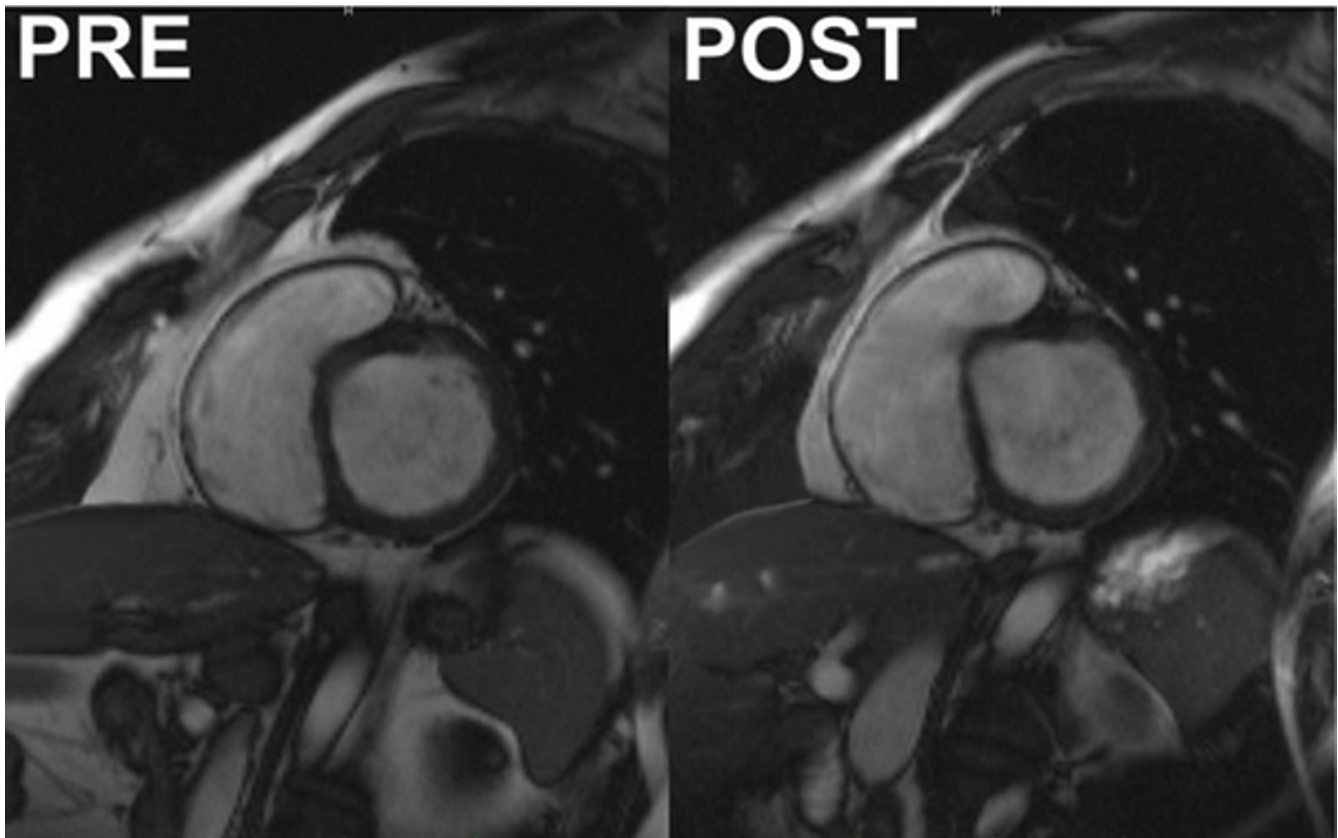


Figure 1

Epicardial fat and its association with abdominal obesity and coronary atherosclerosis may render it a sensitive risk predictor of adverse cardiovascular events. Using CMR, this study assessed epicardial fat and showed a reduction in fat volume following weight loss.

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