

Poster presentation

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Global and regional function quantified on MRI before and after surgical ventricular reconstruction

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Introduction

Surgical ventricular reconstruction (SVR) combined with CABG decreases left ventricular (LV) volumes. A reduced diameter results in a decreased tension of the myocardium and in theory thereby reduced oxygen consumption. However, the effect on left ventricular mechanics is not fully known.

Purpose

The aim was to investigate if left ventricular pumping increases after SVR.

Methods

Cardiac MRI was performed before ($n = 14$) and 1.4 ± 1.1 months after ($n = 11$) SVR (64 ± 9 years, 10 male). Global function and ventricular volumes were assessed by cine MRI. Cardiac output was calculated by MR flow measurement of the aorta. Strain (change in myocardial length divided by original length) was used as a parameter of regional function and measured by phase velocity encoded MRI of the myocardium. Strain measurements could be adequately obtained in 7 patients before and 7 patients after surgery where 5 were imaged both before and after.

Results

End-diastolic and end-systolic volumes normalized to body surface area decreased after SVR (129 ± 11 and 91 ± 11 ml/m²) compared to baseline (169 ± 14 and 129 ± 14 ml/m², $P < 0.01$). There was a slight increase in EF after SVR ($31 \pm 4\%$) compared to baseline ($26 \pm 2\%$, $P = 0.03$). Cardiac index was unchanged after surgery (2.3 ± 0.1 l/

min/m²) compared to before SVR (2.2 ± 0.2 l/min/m²). Regional strain in remote myocardium did not differ significantly after SVR ($34 \pm 3\%$) compared to before surgery ($26 \pm 3\%$, $P = 0.14$) (Figure 1).

Conclusion

Reduced LV size after SVR did not cause a systematic increase in regional myocardial strain or cardiac index. However, our study showed a slight increase in ejection fraction. In contrast to the findings of a recent multicenter trial on SVR compared to CABG our study showed a larger decrease in ESV/m² (29% vs. 19%).

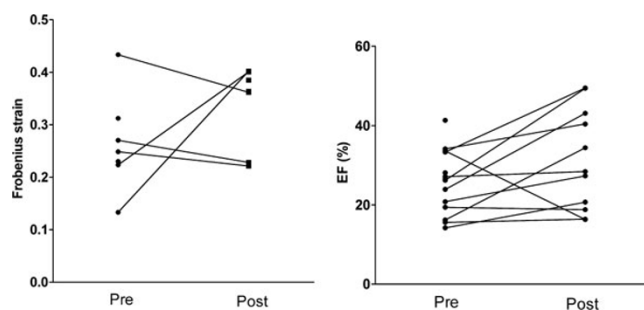


Figure 1
Strain in remote myocardium (left) and ejection fraction (right) pre and post SVR.