SUPPLEMENTAL MATERIAL

Supplemental figures

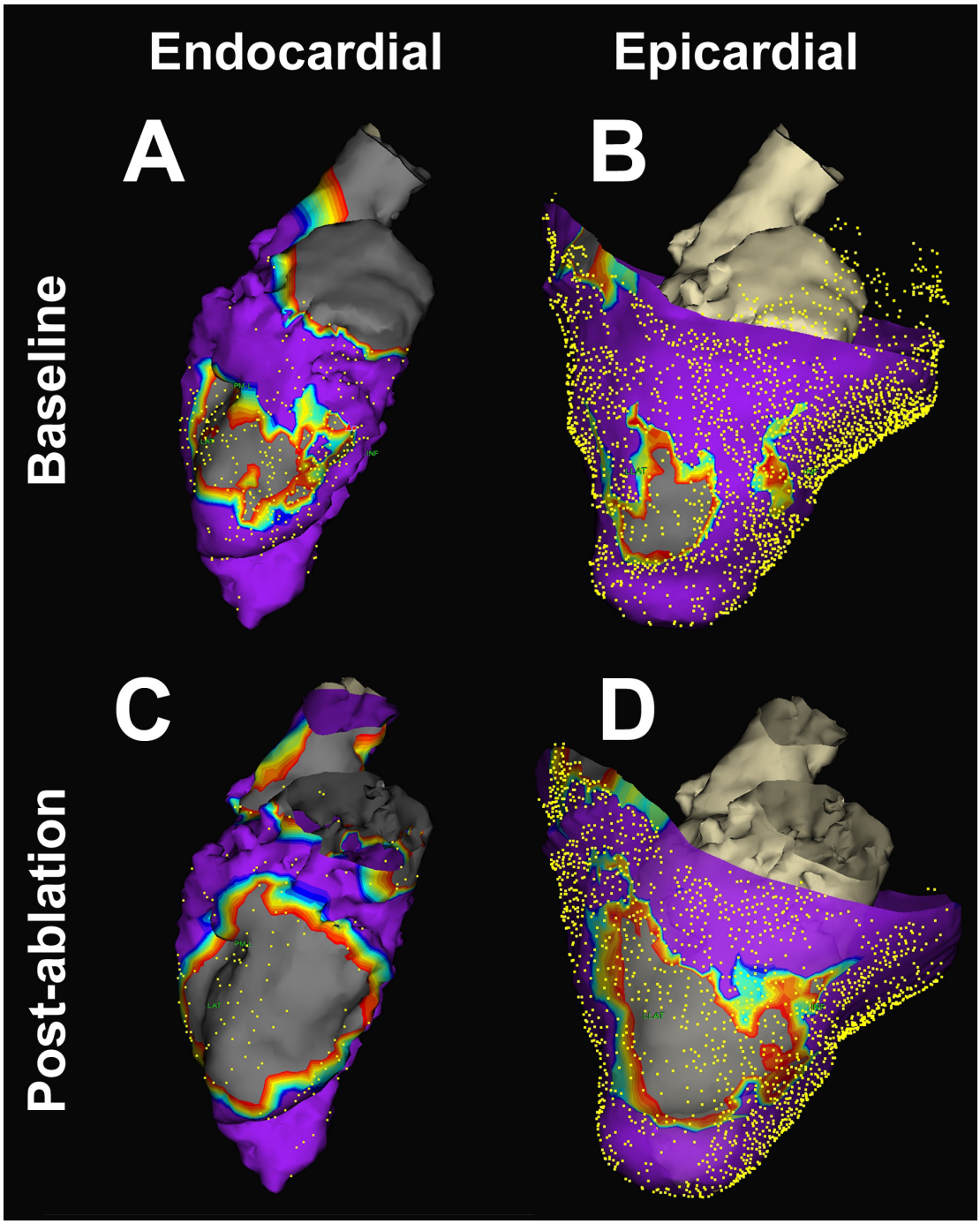

Figure S1: Mapping density before and after chemoablation in an animal model of ischemic cardiomyopathy

Corresponding maps for Figure 4 showing mapping density for (A) baseline endocardial voltage map, (B) baseline epicardial voltage map, (C) post-chemoablation endocardial voltage map, and (D) post-chemoablation epicardial voltage map.

MRI parameters

Steady-state free precession (SSFP) cine imaging: Repetition time (TR)/echo time (TE) 3.1/1.3ms; flip angle 57°; bandwidth 930Hz/pixel; field of view (FOV) 300mmx300mm; matrix 256x256pixels; slice thickness 8mm.

Three-dimensional radial SSFP non-contrast whole heart: TR/TE 3.1/1.5ms; flip angle 115°; bandwidth, 898Hz/pixel; FOV 220x220mm; voxel size 1.1x1.1x1.1mm; base resolution 192; radial views 12360.

Realtime MRI: TR/TE 2.9/1.4ms; flip angle 45°; bandwidth 1000Hz/pixel; matrix 192x108; FOV 300x300mm; GRAPPA Factor 2-4) or gradient echo (TR/TE 4.2/1.9ms; flip angle 15°; bandwidth 500Hz/pixel; matrix 192x144; FOV 300x300mm; GRAPPA Factor 2-4. A real-time inversion recovery sequence could be toggled on to highlight gadolinium enhancement of injection sites, relative to normal myocardium and areas of prior infarction. A non-selective inversion pre-pulse was performed before every bSSFP image acquisition with an interactive inversion time (TI). The next inversion pulse immediately followed the image acquisition, with no additional time for signal recovery. Typical imaging parameters were TI 417ms, TR/TE 2.54/1.27ms, flip angle 45°, FOV 300mm, slice thickness 6 mm, matrix 128x128, GRAPPA factor 2 and frame rate 2 frames/second. The real-time MRI user interface (Interactive Front End, *Siemens*) enabled control of slice plane and thickness, and toggling between rapid imaging for catheter navigation and high contrast real-time inversion-recovery MRI during injection.

Ex-Vivo 3D Hi-Res Isotropic T1-W SPGR: TR/TE 10/5.4ms; flip angle 20°; bandwidth 210Hz/pixel;

matrix 320x320; FOV 180x180mm; voxel size 0.6x0.6x0.6mm; slab thickness 72mm; 120 slices per slab.

LGE PSIR segm FLASH 724: TR/TE 8.2/3.2ms; flip angle 25°; bandwidth 140Hz/pixel; matrix 256x144; FOV 360x270mm; slice thickness 8mm.

MRI analysis: Images were analyzed using QMass MR (*Medis*). Acutely, infarct and lesion could be differentiated by relative signal intensity on phase sensitive inversions recovery LGE (3 and 10 standard deviations above mean respectively). Chronically, lesion signal intensity was similar to infarct (3 standard deviations above mean).

Free gadolinium (Gd^{3+}) assay

The amount of Gd^{3+} was quantified using Arsenazo III, which binds to gadolinium ions to form a complex that can be quantified with a colorimetric assay(1). The amount of free gadolinium was quantified by using Arsenazo III. Arsenazo III binds to gadolinium ions to form a complex, which can be quantified with a colorimetric assay. Standards at concentrations of 0 – 50 µg/ml Gd^{3+} were prepared with gadolinium (III) chloride hexahydrate (Alfa Aesar) prepared in 50% acetic acid (Mallinckrodt Baker). An ultraviolet-visible spectrophotometer (Shimadzu) was used to read absorbance values at 652 nm to form a linear calibration curve. Samples of MRI contrast agents (Magnevist 500mM Gd, Ablavar 250mM Gd, and Dotarem 500mM Gd) were prepared in 50% acetic acid (pH 1.9) at concentrations of 2% and 5% Gd^{3+}, and samples were incubated for 15 minutes before absorbance values at 652 nm were recorded. For Dotarem, values were also recorded after 30 minutes and 60 minutes of incubation time.

Tables

Gadolinium-based contrast agent	Concentration in 50% acetic acid	Incubation time (minutes)	Free Gd^{3+} concentration (mg/ml)
Gadofosveset	2%	15	23

	5%	15	20
Gadopentatate	2%	15	40
	5%	15	42
Gadoterate	2%	15	<LOD
	5%	15	<LOD
	2%	30	<LOD
	5%	30	<LOD
	2%	60	<LOD
	5%	60	<LOD

Table S1: Concentration of free Gd^{3+} in 50% acetic acid solution with 2% or 5% gadolinium-based contrast agent. LOD: limit of detection**.**

References

1. Clogston JD, Patri AK. Detecting and measuring free gadolinium in nanoparticles for MRI imaging. Methods Mol Biol 2011;697:101-8.