

MYOCARDIAL FAT DEPOSITION IN DILATED CARDIOMYOPATHY_ASSESSMENT BY USING MR WATER-FAT SEPARATION IMAGING

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Purpose:

To prospectively investigate the prevalence of fat deposition in dilated cardiomyopathy (DCM) by fat-water separation imaging. An auxiliary aim was to determine the relationship between LV fat deposition and characteristic myocardial fibrosis, as well as cardiac functional parameters.

Materials and Methods:

Forty-eight patients with DCM were scanned on a 1.5T MR scanner (MAGNETOM Avanto, Siemens, Germany) after written informed consent was obtained. The MR scan protocols included a series of short-axis LV cine imaging for functional analysis, fat-water separation imaging using VARPRO, and late gadolinium enhanced (LGE) imaging for fibrosis.. Fat-water separation imaging was covered the entire LV myocardium. Fat deposition and fibrosis location were compared to the scar regions on LGE images using 17-segment model. Statistical comparisons of LV global functional parameters, fibrosis volumes, and fat deposition were carried out using the Pearson correlation, student *t* test and multiple regressions.

Results:

A fat deposition prevalence of 29.2% (14/48) was found in areas of DCM. The patients with fat deposition had larger myocardial fibrosis (27.0 ± 15.1cm³ vs. 12.8 ± 6.1cm³; P<0.01) , larger LVEDV (267.8±48.8ml vs.201.6±46.5,P<0.01) and decreased LV ejection fraction (19.5%±8.4 vs. 29.0%±12.1; P<0.01). The volume of fat deposition was correlated with scar volume, LV ejection fraction, LV end-diastolic volume index, and LV end-systolic volume index.

Conclusion:

Fat deposition is quite a common phenomenon in DCM. And it is associated with DCM characteristics such as fibrosis volume and LV function.

Table : Fibrosis and Fat Deposition Results

	All Patients (n=48)	Fat Deposition (14)	No Fat Deposition (34)	P Value
LV EF (%)	25.4±8.7	19.5%±8.4	29.% ± 12.1	<0.01
LV mass (g)	92.1±20.7	94.2±21.5	91.7±20.1	0.51
LV mass/body surface area (g/m ²)	51.1±11.8	52.1±10.5	50.9±11.5	0.62
LVEDV(ml)	231.7±47.6	267.8±48.8	201.6±46.5	<0.01
LVEDV index (ml/ m ²)	128.3±26.1	148.0±27.7	112.0±24.7	<0.01
LVESV(ml)	177.5±48.8	220.5±49.6	147.2±46.1	<0.01
LVESV index (ml/ m ²)	98.6±27.7	122.5±28.4	81.3±26.9	<0.01
Fibrosis volume (cm ³)	16.1±13.7	27.0 ± 15.1	12.8± 6.1	<0.01
Fibrosis myocardium (%)	18.7±11.2	30.0±14.3	15.7±3.7	<0.01
Fat deposition volume (mL)	3.4±1.2	9.6±7.1	0	...
Fat deposition of myocardial volume(%)	3.5±2.8	14.1±11.5	0	...
Fat deposition of fibrosis volume (%)	18.2±9.3	30.1±14.8	0	...

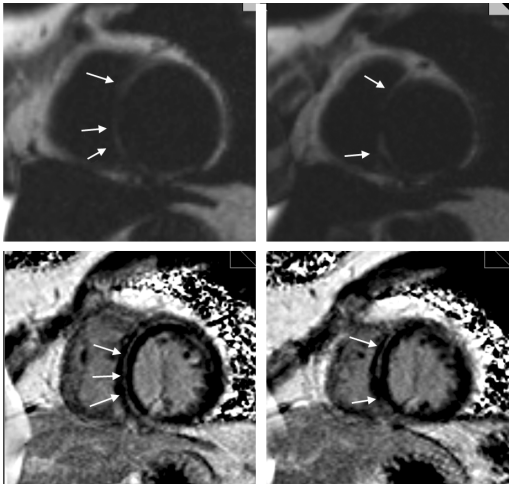


Fig. 1 Examples of intramural fat deposition (arrows) at septum in patients with DCM. The upper row is Fat images and the lower row is LGE Image

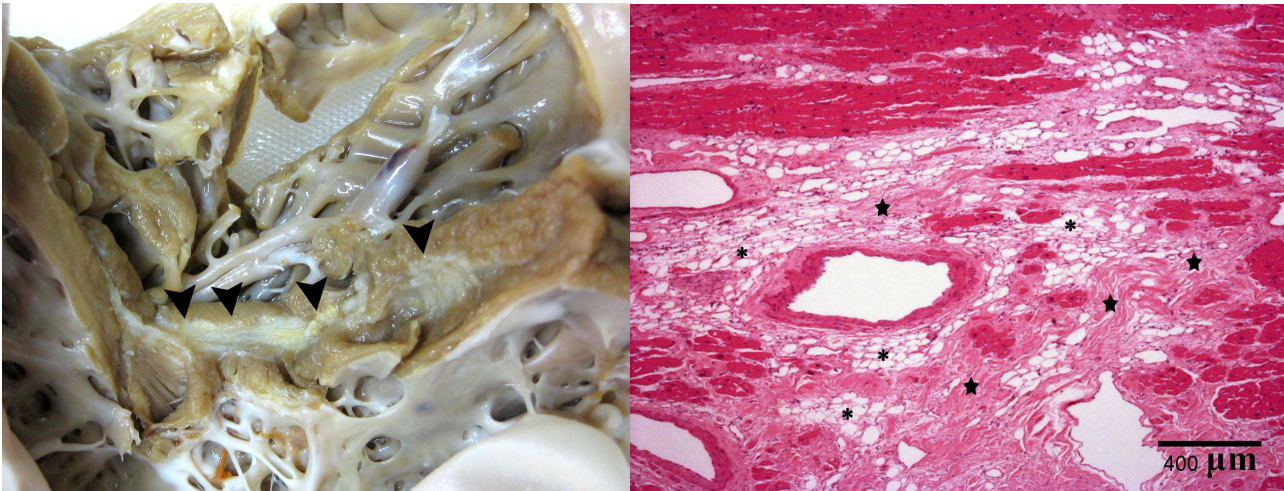


Fig 2. Photograph of an explanted heart at mid septal level (A) Showing the gross morphological features of fat and fiber infiltration in this case. The Yellow-white layer in the intramural septal myocardium (black arrowhead) is comprised of fat and fiber tissue in late photomicrographs investigation. Haematoxylin and eosin stained photomicrographs of advanced lesions in the septal myocardium. (B) From high magnification microscope the lesion is comprised of fat cells(asterisk) and fiber bundles(star). Bar = 400μm