

# LA volume as a Predictor of LV Functional Recovery in Patients with DCM and Absence of Delayed Enhancement in Cardiac MR

*Jeonggeun Moon, In Jeong Cho, Chi Young Shim,  
Young-Jin Kim, Seongha Park, Seok-Min Kang, Yangsoo  
Jang, Namsik Chung, Jong-Won Ha\**

**Severance Cardiovascular Hospital  
Yonsei University College of Medicine**

# Background (I)

- Spontaneous improvement of LV systolic dysfunction can occur in patients with DCM.
- The prediction of LV functional recovery is of clinical importance.
- Because, it may affect the decision for the need for non-pharmacologic managements.  
(cardiac transplantation, ICD, CRT etc.)

# Background (II)

- DE in CMR reflects myocardial fibrosis and is correlated with poor prognosis.
- Functional recovery is more frequently observed in patients who have no DE in CMR.

*Park et al., 2006, J Card Fail.*

- However, even in the absence of DE, not all patients have functional recovery.

# Purpose

- To investigate the predictors of LV functional recovery in patients with DCM and no DE in CMR.

# Methods (I)

Patients with DCM who had CMR  
(N = 118; 2003~2009)

75 patients with DE  
were excluded

No DE in CMR  
(N = 43)

**Group 1; with functional  
recovery  
(n = 14)**

**Group 2; without functional  
recovery  
(n = 29)**

# Methods (II)

- **Functional recovery was defined as**
  - 1) an increase of LV EF  $\geq$  50%**
  - 2) net increase in EF  $\geq$  20%**

# Clinical Characteristics (I)

	Group 1 (n=14)	Group 2 (n=29)	P value
Follow-up duration (months)	16.5±11.8	31.8±9.6	---
Age, y	52±14	58±14	0.270
Sex (male : female)	11:3	17:12	0.198
DM, n (%)	2 (14)	4 (14)	0.965
Hypertension, n (%)	4 (29)	4 (14)	0.243
Dyslipidemia, n (%)	1 (7)	5 (17)	0.371

# Clinical Characteristics (II)

	Group 1 (n=14)	Group 2 (n=29)	<i>P</i> value
<b>NYHA class III or IV, n (%)</b>	<b>13 (93)</b>	<b>21 (72)</b>	<b>0.413</b>
<b>Atrial fibrillation, n (%)</b>	<b>3 (21)</b>	<b>6 (21)</b>	<b>1.000</b>
<b>QRS duration (ms)</b>	<b>102.3±20.1</b>	<b>108.7±30.3</b>	<b>0.726</b>
<b>Initial laboratory data</b>			
<b>Ln (NT-proBNP)</b>	<b>6.0±2.2</b>	<b>7.5±1.2</b>	<b>0.083</b>
<b>eGFR (mL/min/1.73m<sup>2</sup>)</b>	<b>77.4±23.7</b>	<b>75.6±19.3</b>	<b>0.785</b>



# Prescribed Medication

	Group 1 (n=14)	Group 2 (n=29)	<i>P</i> value
<i>Prescribed medication, n (%)</i>			
Beta-blocker	13 (93)	23 (79)	0.658
ACEi or ARB	14 (100)	28 (97)	0.958
Aldosterone antagonist	11 (79)	20 (69)	0.687
IV inotropics	3 (21)	5 (18)	0.485

# Echo Parameters (I)

	Group 1 (n=14)	Group 2 (n=29)	P value
<i>Initial echo parameters</i>			
LVEF (%)	25.6±6.1	23.9±5.5	0.384
Stroke volume (mL)	36.0±13.9	37.5±15.8	0.845
Cardiac output (L/min)	3.1±1.2	3.0±1.4	0.801
<b>LVEDD (mm)</b>	<b>62.2±6.0</b>	<b>66.6±6.6</b>	<b>0.048</b>
LVESD (mm)	54.4±6.5	58.8±6.7	0.107
LVMI (g/m <sup>2</sup> )	140.0±34.2	151.3±39.2	0.479
<b>LAVI (ml/m<sup>2</sup>)</b>	<b>26.1±7.8</b>	<b>45.3±17.7</b>	<b>&lt;0.0001</b>

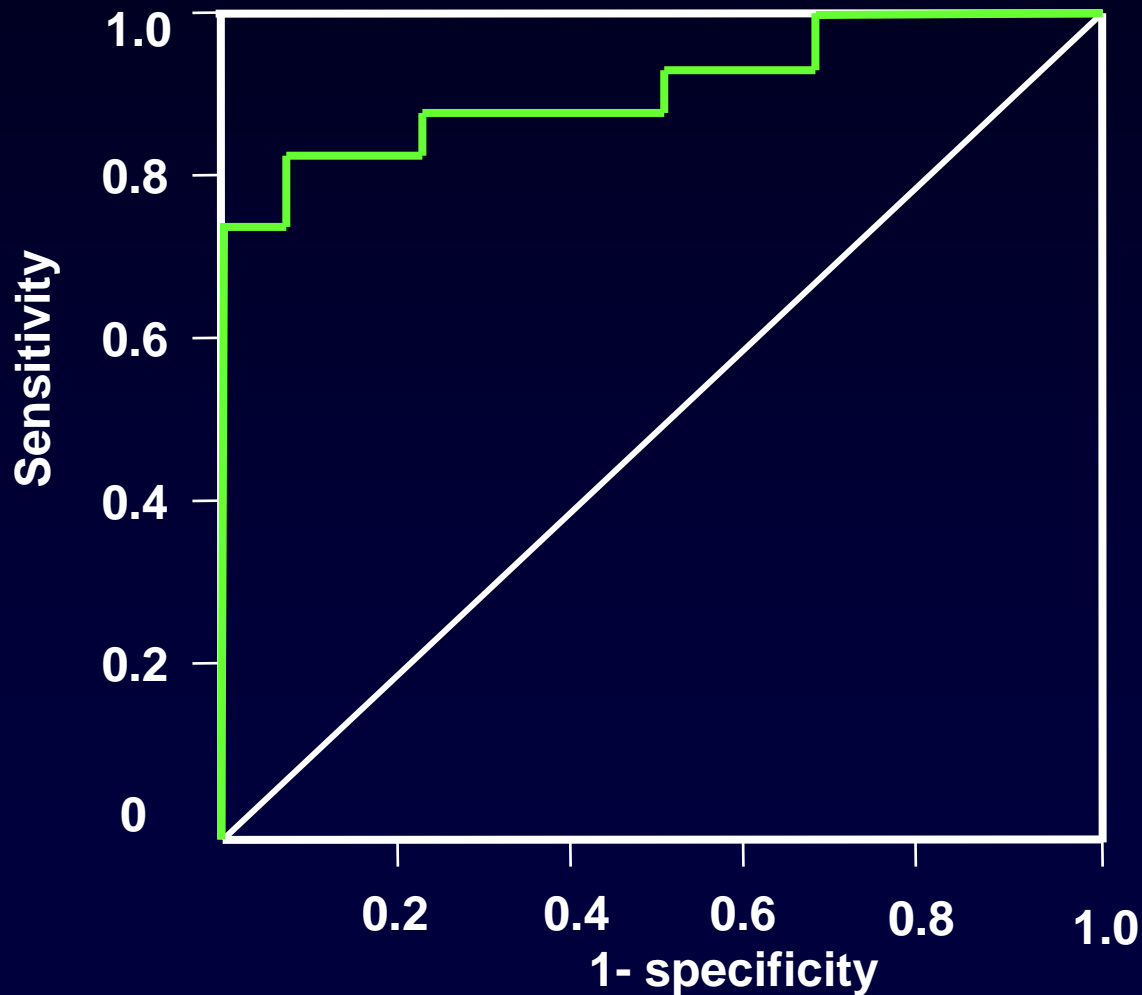
# Echo Parameters (II)

	Group 1 (n=14)	Group 2 (n=29)	P value
E (cm/s)	70.4±32.0	73.2±37.9	0.936
DT (ms)	167.6±59.5	152.8±60.2	0.476
A (cm/s)	62.6±16.2	57.5±24.7	0.539
E/A	1.3±0.7	1.5±1.2	0.733
E' (cm/s)	5.1±1.5	4.2±1.1	0.626
E/E'	13.2±4.3	17.7±8.3	0.186
A' (cm/s)	6.8±1.7	5.3±2.0	0.091
S' (cm/s)	5.1±1.6	4.0±1.6	0.070
Severe MR (≥III/IV; n [%])	1 (7)	7 (24)	0.150
RVSP (mm Hg)	31.9±10.1	36.0±14.1	0.584

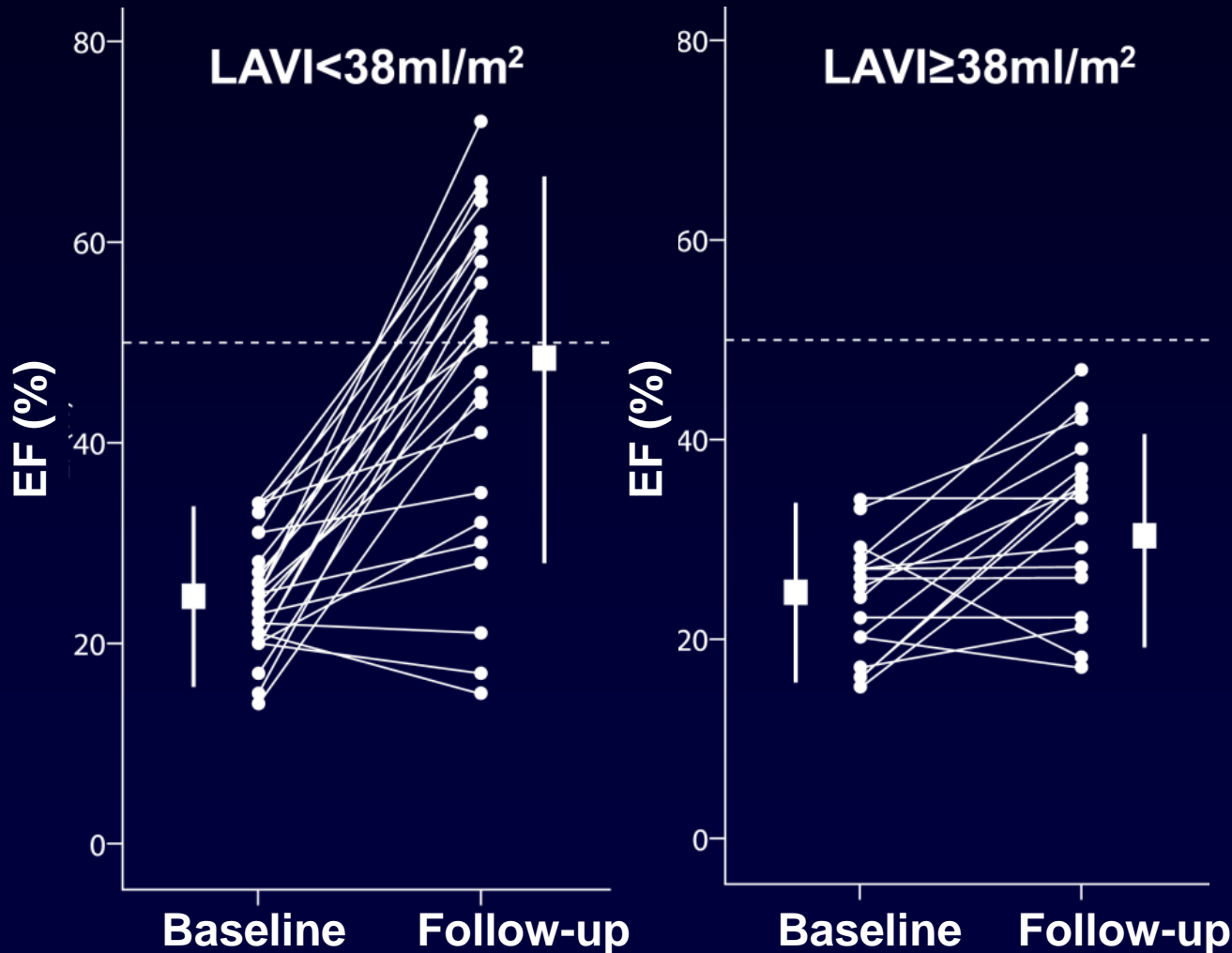
# Multivariate Analysis to Determine Predictors of Function Recovery

	Odds ratio (95% CI)	<i>P</i> value
LVEF	1.230 (0.931- 1.626)	0.145
LVEDD	0.607 (0.348-1.061)	0.080
LVESD	1.669 (0.900-3.095)	0.104
<b>LAVI</b>	<b>0.858 (0.766-0.961)</b>	<b>0.008</b>
Severe MR( $\geq$ III/IV)	0.607 (0.030-12.473)	0.746

# ROC curve to examine the prediction power of LAVI



# Changes in LV Function



**Cutoff value:**  
**LAVI: 38 ml/m<sup>2</sup>**  
**Sensitivity=76.5%**  
**Specificity=100%**

# Summary (I)

- 1) About 66% of the patients with DCM failed to have functional recovery despite the absence of DE in CMR.
- 2) In patients who showed functional recovery, LAVI and LVEDD were significantly smaller than those without functional recovery.

# Summary (II)

- 3) In multivariate analysis, LAVI was the only significant parameter associated with LV functional recovery.
- 4)  $LAVI < 38 \text{ ml/m}^2$  had 100% specificity in predicting the improvement of LV systolic dysfunction.



# Conclusion

- 1) The absence of DE in CMR does not guarantee LV functional recovery in DCM.**
- 2) In patients with DCM who had no DE in CMR, echocardiographically-determined LAVI predicts future LV functional recovery with high specificity.**
- 3) In patients with DCM who have a relatively smaller LA and LV, non-pharmacologic therapies may be deferred.**