Case Study

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Patient Case History

- 44 y.o. gentleman
- Hospitalized 2 months ago with AHF (1st episode)
- IV diuretics excellent response
- Discharged on:
  - Bisoprolol 5 mg
  - Candesartan 8 mg
  - Furosemide 40 mg
- Medical history:
  - Hypertensive
  - Obese (BMI: 37 kg/m2)

On assessment:
- BP: 155/80 mmHg
- HR: 98 bpm
- O2sat: 97% (room air)
- Positive NVD/HJR
- Bilateral rales on auscultation
- +2 lower extremity edema
- Grade 3/6 SEM apex
- S3 gallop heard

NYHA FC III

Initial evaluation:
- Mildly elevated bilirubin
- Creatine: 1.0
- Normal electrolytes
- NT pro-BNP of 3127 pg/ml.
- Normal ferritin and iron studies
- Negative HIV
ECG

Coronary Angiography

Normal Coronaries

Elevated LVEDP: 21mmHg
Echocardiography

Severe global hypokinnesia
LVEF: 20%
LVEDD 83mm
Grade II MR
Grade I TR
sPAP: 60mmHg
G III DD
Elevated LVEDP (E/E’ = 30)
Moderate RV Dilation/Mildly hypokinetic
What is Next?

A- ICD implantation (high risk for SCD)

B- Refer immediately for LVAD/Transplant evaluation

C- Optimize Medical Therapy and evaluate after 3 months

D- CRT-D implantation
Does a Cardiac Magnetic Resonance Imaging Help?

A- Yes

B- No
Which of the following is a predictor of LV recovery and or normalization in Recent Onset Cardiomyopathy?

A-Extensive LGE-CMR
B-Lower LVEF
C-Higher BP on presentation
D-Larger LV size
E-Wider QRS
CMR

- Left atrial dilation
- Severely LV dilation (EDD:86mm)
- LVEF 22%
- LV mass of 371g
- LVEDV of 447.4ml.
- LGE: no myocardial enhancement
Echocardiography 8 months later
<table>
<thead>
<tr>
<th></th>
<th>Day 0</th>
<th>Day 10</th>
<th>Day 64</th>
<th>Day 237</th>
<th>Day 430</th>
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<tbody>
<tr>
<td>CO (l/min)</td>
<td>3.5</td>
<td>3.0</td>
<td>4</td>
<td>5</td>
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<tr>
<td>LVEDD (mm)</td>
<td>83</td>
<td>83</td>
<td>60</td>
<td>55</td>
<td>50</td>
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<tr>
<td>LVESD (mm)</td>
<td>76</td>
<td>76</td>
<td>52</td>
<td>38</td>
<td>40</td>
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<td>E/E'</td>
<td>30</td>
<td>7.7</td>
<td>7.3</td>
<td>8.1</td>
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<tr>
<td>LVEF (%)</td>
<td>15</td>
<td>22</td>
<td>40</td>
<td>55</td>
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<tr>
<td>MR grading</td>
<td>II</td>
<td>I</td>
<td>No MR</td>
<td>No MR</td>
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</tbody>
</table>
LGE-CMR in ROCM

Predicts increased frequency of HF hospitalization
Predicts risk of ICD shocks
It predicts risk of malignant arrhythmias
It predicts extent of LV recovery
DANISH

A DANish randomized, controlled, multicenter study to assess the efficacy of Implantable cardioverter defibrillator in patients with nonischemic Systolic Heart failure on mortality

Entry criteria

- Clinical heart failure
- Documented nonischemic aetiology
- Optimal medical treatment
- NYHA functional class II or III (class IV if planned CRT)
- Left ventricular ejection fraction ≤35%
- NT-proBNP >200pg/mL (23.6 pmol/L)

Endpoints

Primary endpoint:
- All-cause mortality

Secondary endpoints:
- CV mortality
- Sudden cardiac death
Primary outcome
- all-cause mortality

120 died in the ICD group and 131 in the control group
Hazard ratio = 0.87 (0.68 – 1.12)
P = 0.28

Secondary outcome
- cardiovascular mortality

Hazard Ratio = 0.77 (0.57 – 1.05)
P = 0.10

Secondary outcome
- sudden cardiac death

Hazard Ratio = 0.50 (0.31 – 0.82)
P = 0.005
DANISH
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Age - youngest two tertiles - age <68 years

Age - oldest tertile - age >68 years
Clinical and Demographic Predictors of Outcomes in Recent Onset Dilated Cardiomyopathy

Results of the IMAC (Intervention in Myocarditis and Acute Cardiomyopathy)-2 Study

Dennis M. McNamara, MD, MSc,* Randall C. Stauding, MD,† Leslie T. Cooper, MD,‡ John P. Boehmer, MD,§ Paul J. Mather, MD,‖ Karen M. Janosko, MSN, MBA,* John Gorcsan III, MD,* Kevin E. Kip, PhD,‡ G. William Docc, MD,# for the IMAC Investigators

Pittsburgh, Hershey, and Philadelphia, Pennsylvania; Cleveland, Ohio; Rochester, Minnesota; Tampa, Florida; and Boston, Massachusetts

Myocardial Recovery by LVEDD

- 70% increase 10EF units at 6 months
- 39% increase of > 20 EF units at 6 months
- 40% had EF 45% or more at 6 months
- 25% LV normalized (more women less blacks)

Black bar LVEDD <6 cm
Shaded bar LVEDD 6-7 cm
White Bar LVEDD > 7 cm

Mean LVEDD 6.1±1.0 cm

LVEDD at presentation was the strongest predictor of LVEF at 6 months

J Am Coll Cardiol 2011;58:1112–8)
Implantable Cardiac Defibrillators and Sudden Death in Recent Onset Nonischemic Cardiomyopathy: Results From IMAC2

RICHARD SHEPPARD, MD.1 PAUL J. MATHER, MD.2 JEFFREY D. ALEXIS, MD.3 RANDALL C. STABLING, MD.4 JOHN F. BOEHMER, MD.5 VINAY THOHAN, MD.6 DANIEL F. PAULY, MD, PhD.7 DAVID W. MARKHAMS, MD, MSc.8 MARK ZUCKER, MD.9 KEVIN E. KIP, PhD.10 AND DENNIS M. MCNAMARA, MD, MS.11

FOR THE IMAC INVESTIGATORS

Montreal, Canada; Philadelphia, Herhey, and Pittsburgh, Pennsylvania; Rochester, New York; Cleveland, Ohio; Winston Salem, North Carolina; Knoxville and Tampa, Florida; Dallas, Texas; and Newark, New Jersey

Survival in IMAC2

SCD in IMAC 2

373 patients

J Cardiac Fail 2012;18:675-681
Late Gadolinium Enhancement by Cardiovascular Magnetic Resonance Heralds an Adverse Prognosis in Nonischemic Cardiomyopathy

Katherine C. Wu, MD, FACC,* Robert G. Weiss, MD,*‡ David R. Thiemann, MD,*§ Kakuya Kitagawa, MD,* André Schmidt, MD,* Darshan Dalal, MD,* Shenghan Lai, MD, PhD,‡ David A. Bluemke, MD, PhD,*‡ Gary Gerstenblith, MD, FACC,* Eduardo Marbán, MD, PhD, FACC,* Gordon F. Tomaselli, MD, FACC, João A. C. Lima, MD, FACC§‡

Baltimore, Maryland

Results

Prospective
65 NICM
EF<35%
CMR before ICD
primary prevention

Index Composite endpoint:
- HF hospitalization
- Appropriate ICD firing
- Cardiac death

Duration of CM >4 yrs
LVEF: 25%±10
LGE extent 17±2.1 ml volume

38 pts: 58%

8-fold higher risk

Median time to Index event 10.2 months

Wu et al JACC 2008
Myocardial Fibrosis Predicts Appropriate Device Therapy in Patients With Implantable Cardioverter-Defibrillators for Primary Prevention of Sudden Cardiac Death

Leah Ilos, MBChB, Heinz Pfugler, MD, Lisa Leikovits, MBBS, Michelle J. Butler, MBBS, Peter M. Kistler, PhD, David M. Kaye, PhD, Andrew J. Taylor, PhD
Melbourne, Australia

Results

103 pts
ICD criteria primary prevention
NICM: 61
ICM: 42
LGE+ NICM: 31 (51%)
Primary endpoint: Appropriate Device Therapy
Secondary composite: device therapy; HTx and all cause mortality
LVEF 25-.12

ICD discharge LGE+NICM 9 (29%)
ICD discharge LGE -:0%
ICD discharge ICM: 6 (14%)

JACC 2011
References


