Severe Left Ventricular Dysfunction: Evolving Revascularization Strategies

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No Relationships to Disclose
Prognosis in Chronic CAD

Influence of LV Ejection Fraction

Prognosis in Ischemic LV Dysfunction

Increase in Survival by Revascularization

<table>
<thead>
<tr>
<th>Study</th>
<th>Year</th>
<th>Increase in Survival (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Vliestra</td>
<td>1977</td>
<td>10%</td>
</tr>
<tr>
<td>Alderman</td>
<td>1983</td>
<td>30%</td>
</tr>
<tr>
<td>Manley</td>
<td>1976</td>
<td>37%</td>
</tr>
<tr>
<td>Muhlbaier</td>
<td>1992</td>
<td>41%</td>
</tr>
<tr>
<td>Pigott</td>
<td>1985</td>
<td>44%</td>
</tr>
<tr>
<td>Bounous</td>
<td>1988</td>
<td>55%</td>
</tr>
<tr>
<td>Faulkner</td>
<td>1977</td>
<td>57%</td>
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</tbody>
</table>
Prognosis in Ischemic LV Dysfunction

Increase in Survival by Medical Therapy

<table>
<thead>
<tr>
<th>Treatment</th>
<th>Increase in Survival (%)</th>
<th>Reference</th>
</tr>
</thead>
<tbody>
<tr>
<td>ACEi / ARB</td>
<td>38%</td>
<td>[20, 68]</td>
</tr>
<tr>
<td>ACEi / ARB + β blocker</td>
<td>77% (43, 91)</td>
<td></td>
</tr>
<tr>
<td>ACEi / ARB + β blocker + ICD / CRT</td>
<td>90% (70, 96)</td>
<td>from Yancy CW, <em>J Am Heart Assoc</em> 2012;1:16-26</td>
</tr>
</tbody>
</table>
Surgical Treatment for Ischemic Heart Failure
STICH Trial

- 1212 patients with EF <35%
- 99 sites in 22 countries
- Primary Endpoint: All-cause mortality
- Secondary Endpoints:
  - CV mortality
  - Death + CV hospitalization
  - Death + HF hospitalization
STICH Primary Outcome
All-Cause Mortality

Medical therapy
CABG

1212 patients
EF <35%

HR     95% CI
0.86   0.72.1.04

P = 0.123

STICH Secondary Outcome
Cardiovascular Mortality

![Graph showing the comparison of cardiovascular mortality rates between medical therapy and CABG over 6 years after randomization. The graph includes a Kaplan-Meier survival curve with two lines: one for medical therapy and one for CABG. The HR and 95% CI for medical therapy are provided: HR = 0.81, 95% CI = 0.66 to 1.00. The P-value is 0.050.]

STICH Secondary Outcome
Death + CV Hospitalization

STICH Secondary Outcome
All-Cause Mortality – Treatment Received

Medical therapy vs. CABG over 6 years.

Doenst et al. *Circ Heart Fail* 2013;6:443-450
STICH Secondary Outcome
All-Cause Mortality – Per Protocol

![Graph showing mortality rates over years after randomization]

- Medical therapy
- CABG

<table>
<thead>
<tr>
<th>HR</th>
<th>95% CI</th>
</tr>
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<tbody>
<tr>
<td>0.76</td>
<td>0.62, 0.92</td>
</tr>
</tbody>
</table>

\[P = 0.005\]

Doenst et al. *Circ Heart Fail* 2013;6:443-450
Is STICH a negative trial or a positive trial?

Myocardial Revascularization in Patients with LV Dysfunction

The STICH Trial:
Are there subsets who benefit from CABG?

Myocardial viability
Myocardial Revascularization in Patients with LV Dysfunction

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Myocardial viability

The STICH Trial:
Are there subsets who benefit from CABG?

Myocardial viability

The Heart Trial
With Viability

Medical therapy (n=69)
Revascularization (n=69)

n=138
p=NS

from Cleland et al, Eur J Heart Fail 2011;13:227-233

Patients with ESVI ≤84 ml/m²

5-Year Mortality Rate (%)

Extent of Baseline Viability (percent)
Patients with ESVI ≤84 ml/m²

Patients with ESVI >84 ml/m²
Heart Failure

Myocardial Viability Testing and the Effect of Early Intervention in Patients With Advanced Left Ventricular Systolic Dysfunction

Khalfoun G. Tarakji, M. Obadah Al-Chekak, Eugene

Revascularization vs Medical Therapy in Patients with Left Ventricular Dysfunction

n=306

3-Year Mortality (%) vs Amount of Compromised Viable Myocardium (%)

from Tarakji et al, Circulation 2006;113:230-237
Myocardial Revascularization in Patients with LV Dysfunction

The STICH Trial:
Are there subsets who benefit from CABG?

Myocardial ischemia
Myocardial Revascularization in Patients with LV Dysfunction

The STICH Trial:
Are there subsets who benefit from CABG?

Myocardial ischemia

Impact of Ischemia and Scar on Therapeutic Benefit of Coronary Revascularization

- Magnitude of ischemic myocardium associated with survival benefit with revascularization in patients *without* prior MI
- No such benefit in patients *with* prior MI
- Role of ischemia not significant in patients with >10% myocardial scar

Hachamovich et al, *Eur Heart J* 2011;32:1012-1024
Myocardial Revascularization in Patients with LV Dysfunction

**The STICH Trial:**
Are there subsets who benefit from CABG?

Biomarkers

Feldman et al. *Circ Heart Fail* 2013;6:461-472
Myocardial Revascularization in Patients with LV Dysfunction

The STICH Trial:
Are there subsets who benefit from CABG?

Functional capacity

Stewart et al. *JACC Heart Fail* 2014;2:335-343
Myocardial Revascularization in Patients with LV Dysfunction

The STICH Trial:
Are there subsets who benefit from CABG?
CAD severity, EF, ESV

Panza et al. J Am Coll Cardiol 2014;64:553-561
Myocardial Revascularization in Patients with LV Dysfunction

Factors to consider:

More important:
- Severity of LV dysfunction
- Severity of LV remodeling
- Angiographic severity of CAD
- Functional capacity

Less important:
- Extent of myocardial viability
- Severity of myocardial ischemia
- Biomarkers

Velazquez and Bonow. J Am Coll Cardiol 2015;65:615-624