Discussion of REGROUP

By MARC RUEL, MD, MPH, FRCSC, FCCS, FAHA
Endoscopic Vein Harvest (EVH) is very popular; >70% of CABG in North America; less in Europe and Asia. It is associated with less pain, less infection, and better patient satisfaction. However, decreased patency and higher death rate in most impactful study to date (observational study within PREVENT IV RCT). No study had examined all of: vein histology, recovery outcomes, patency, and MACE in a large RCT design.

What we knew before

Table 2. Angiographic Outcomes, According to Vein-Graft Harvesting Technique.*

<table>
<thead>
<tr>
<th>Outcome</th>
<th>Total</th>
<th>Open Harvesting</th>
<th>Endoscopic Harvesting</th>
<th>Odds Ratio (95% CI)</th>
<th>P Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Patients</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total no.</td>
<td>1817</td>
<td>822</td>
<td>995</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Vein-graft failure (%)</td>
<td>42.8</td>
<td>38.0</td>
<td>46.7</td>
<td>1.45 (1.20–1.76)</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td>Vein-graft occlusion (%)</td>
<td>38.6</td>
<td>33.8</td>
<td>42.6</td>
<td>1.47 (1.20–1.79)</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td>Grafts</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total no.</td>
<td>4290</td>
<td>1969</td>
<td>2321</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Vein-graft failure (%)</td>
<td>25.1</td>
<td>22.6</td>
<td>27.2</td>
<td>1.34 (1.14–1.59)</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td>Vein-graft occlusion (%)</td>
<td>22.0</td>
<td>19.4</td>
<td>24.2</td>
<td>1.39 (1.17–1.66)</td>
<td>&lt;0.001</td>
</tr>
</tbody>
</table>

* The odds ratios and P values were calculated with the use of adjusted logistic-regression models in the case of the per-patient analysis and with the use of generalized estimating equations in the case of the per-graft analysis. The models for patients were adjusted for weight, duration of surgery, worst graft quality, worst target-artery quality, and use of composite or noncomposite grafts. The models for grafts were adjusted for weight, duration of surgery, graft quality, target-artery quality, and composite or noncomposite graft.

† Vein-graft failure was determined to have occurred if there was stenosis of at least 75% of the diameter of the graft.
What we knew before

• Endoscopic Vein Harvest (EVH) is very popular; >70% of CABG in North America; less in Europe and Asia
• It is associated with less pain, less infection, and better patient satisfaction
• However, decreased patency and higher death rate in the most impactful study to date (observational study within PREVENT IV RCT)
• No study examined all of: vein histology, recovery outcomes, patency, and MACE in a large RCT design

REVIEW

The influence of endoscopic vein harvesting on outcomes after coronary bypass grafting: a meta-analysis of 267 525 patients

Priya Sastry*, Rasmus Rivinius†, Rebecca Harvey‡, Richard A. Parker‡, Ann-Kathrin Rahm‡, Dierk Thomas‡, Sukumaran Nair‡ and Stephen R. Large‡

CONSENSUS STATEMENT

Endoscopic Conduit Harvest in Coronary Artery Bypass Grafting Surgery
An ISMICS Systematic Review and Consensus Conference Statements

Francis D. Ferdinand, MD, *, John K. MacDonald, MA, † Husam H. Balkhy, MD, ‡ Gianluigi Bisleri, MD, §
Ho Young Hwang, MD, PhD, || Patricia Northrup, PA-C, *, Richard H. J. Trimlett, MBBS, ¶
Lai Wei, MD, # and Bob B. Kiatti, MD**

Objective: The purpose of this consensus conference was to develop and update evidence-informed consensus statements and recommendations on harvesting saphenous vein and radial artery via an open as compared with endoscopic technique by systematically reviewing and performing a meta-analysis of randomized and nonrandomized clinical trials.

Methods: All randomized controlled trials and nonrandomized controlled trials included in the first the International Society for Minimally Invasive Cardiothoracic Surgery Consensus Conference and Statements, 12 in 2005 up to November 30, 2015 were included in a systematic review and meta-analysis. Based on the resultant, 76 studies (23 randomized controlled trials and 53 nonrandomized controlled trials) on 281,459 patients analyzed, consensus statements, and recommendations were generated comparing the risks and benefits of endoscopic versus open conduit harvesting for patients undergoing coronary artery bypass grafting.

Results: Compared with open vein harvest, it is reasonable to perform endoscopic vein harvest of saphenous vein to reduce wound-related complications, postoperative length of stay, and outpatient wound management resources and to increase patient satisfaction (class I, level A). Based on the quality of the conduit and major adverse cardiac events as well as 6-month angiographic patency, endoscopic vein harvest was noninferior to open harvest. It is reasonable to perform endoscopic radial artery harvest to reduce wound-related complications and to increase patient satisfaction (class I, level B-R and B-NR, respectively) with reduction in major adverse cardiac events and noninferior patency rate at 1 and 3 to 5 years (class III, level B-R).

Conclusions: Based on the consensus statements, the consensus panel recommends (class I, level B) that endoscopic saphenous vein and radial artery harvesting should be the standard of care for patients who require these conduits for coronary revascularization.
What we now know from REGROUP

- EVH is as good as OVH for the prevention of MACE
  - after on-pump CABG
  - in expert EVH centres
  - at 2.78 years

- As expected, fewer wound complications
Strengths

• Definitive trial, with no trend towards more events with EVH
• Few sources of bias (except masking)
• High randomized / screened ratio (> 1/3)

Weaknesses

• Expert OVH centres? No pedicled no-touch OVH. Very few radials and OPCABs
• No histology & no patency data. Patency is assumed to be good, but could it be low across the board?
Questions & Future Directions

Is this the last trial? Is the question fully answered?

Is EVH central to a better CABG product?

Can we do better by using radials (?endoscopic), pedicled no-touch veins, and lower leg veins?

Which operation would you want for yourself?