Primary PCI tips and tricks

Hany Ragy MD
Combat MI 2014

Primary PCI tips and Tricks

• Most important is adherence to EBM specially in trying to improve DBT and EBT of STEMI, both pharmacological & mechanical and long term secondary prevention
Comparing outcomes

PCI vs Fibrinolysis: Short-Term Clinical Outcomes

PCI vs Fibrinolysis: Long-Term Clinical Outcomes

Absolute Risk Difference in Death (%) vs PCI-Related Time Delay (min)

13 RCTs
N = 5494
P = 0.04
• **Heparin** (class I, level C to class IIa, level C)
  – LMWH or UFH (max 4000u bolus, 1000u/hr)
    • Indirect inhibitor of thrombin
    • less supporting evidence of benefit in era of reperfusion
    • Adjunct to surgical revascularization and thrombolytic / PCI reperfusion
    • 24-48 hours of treatment
    • Coordinate with PCI team (UFH preferred)
    • Used in combo with **ASPIRIN (1A)** and/or other platelet inhibitors
    • Changing from one to the other not recommended

---

**Additional medication therapy**

• **Clopidodrel** (class I, level B)
  • Irreversible inhibition of platelet aggregation
  • Used in support of cath / PCI intervention or if unable to take aspirin
  • 3 to 12 month duration depending on scenario

• **Glycoprotein IIb/IIIa inhibitors**
  (class IIa, level B)
  • Inhibition of platelet aggregation at final common pathway
  • In support of PCI intervention as early as possible prior to PCI
2011 ACC/AHA/SCAI guidelines
Aspiration Thrombectomy

• Class IIa
• Aspiration thrombectomy is reasonable in patients undergoing primary PCI (Level of evidence B)

• However after the TASTE data this may change, awaiting further large trial.

Use of stents in STEMI

NEW Recommendation

It is reasonable to use a drug-eluting stent as an alternative to a bare-metal stent for primary PCI in STEMI

* Consideration for the use of stents (DES or BMS) in STEMI should include the ability of the patient to comply with prolonged dual antiplatelet therapy, the bleeding risk in patients on chronic oral anticoagulation, and the possibility that the patient may need surgery during the ensuing year.
## Radial vs Femoral Access Impact on Major Bleeding

### Meta-analysis of Randomized Trials

<table>
<thead>
<tr>
<th>Study or sub-category</th>
<th>nR</th>
<th>nF</th>
<th>Data OR</th>
<th>95% CI</th>
<th>Data OR</th>
<th>95% CI</th>
</tr>
</thead>
<tbody>
<tr>
<td>ACCESS</td>
<td>0/200</td>
<td>4/200</td>
<td>0.13</td>
<td>(0.02, 0.94)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>AHA 2003</td>
<td>0/152</td>
<td>4/155</td>
<td>0.14</td>
<td>(0.02, 0.97)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>BRAVE</td>
<td>0/50</td>
<td>1/35</td>
<td>0.15</td>
<td>(0.05, 0.75)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Bohll et al.</td>
<td>3/566</td>
<td>7/322</td>
<td>0.19</td>
<td>(0.05, 0.51)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>FARMI</td>
<td>3/577</td>
<td>3/57</td>
<td>3.09</td>
<td>(0.13, 1.14)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Cox pe</td>
<td>1/214</td>
<td>1/214</td>
<td>1.01</td>
<td>(0.06, 1.05)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Nuus</td>
<td>0/68</td>
<td>2/77</td>
<td>0.15</td>
<td>(0.01, 2.44)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>OCTPLUS</td>
<td>1/196</td>
<td>7/185</td>
<td>0.21</td>
<td>(0.05, 0.89)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>OUTCAI</td>
<td>0/222</td>
<td>1/222</td>
<td>0.14</td>
<td>(0.03, 0.92)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>RADIAL AvH</td>
<td>3/25</td>
<td>4/25</td>
<td>0.27</td>
<td>(0.01, 1.02)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>RAPID</td>
<td>0/90</td>
<td>7/100</td>
<td>0.61</td>
<td>(0.11, 1.10)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>TEBURU</td>
<td>0/77</td>
<td>2/72</td>
<td>0.12</td>
<td>(0.02, 0.22)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Vazquez-Rodriguez</td>
<td>2/227</td>
<td>6/222</td>
<td>0.27</td>
<td>(0.08, 1.10)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total (n=13)</td>
<td>2290</td>
<td>2068</td>
<td>0.27</td>
<td>(0.19, 0.45)</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Test for heterogeneity: CH² = 5.66 (df = 12) P = 0.05, I² = 6%
Test for overall effect Z = 5.02 (P = 0.0000)

**Major Bleeding: 0.54% vs 2.32%**

- Favours RADIAL
- Favours FEMORAL
TRI save lives?

Association of the arterial access site at angioplasty with transfusion and mortality: the M.O.R.T.A.L study (Mortality benefit Of Reduced Transfusion after percutaneous coronary intervention via the Arm or Leg)

A J Chase,1,2 E B Fretz,2 W P Warburton,3 W P Klinke,2 R G Carere,4 D Pi,5 B Berry,2 J D Hilton2

<table>
<thead>
<tr>
<th>Raw outcomes whole cohort</th>
<th>Whole sample (n = 38 872)</th>
<th>Radial cases (n = 7972)</th>
<th>Femoral cases (n = 30 900)</th>
<th>p Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Received transfusion</td>
<td>967 (2.5)</td>
<td>108 (1.4)</td>
<td>859 (2.8)</td>
<td>&lt;0.01</td>
</tr>
<tr>
<td>30-Day mortality</td>
<td>599 (1.5)</td>
<td>78 (1.0)</td>
<td>520 (1.7)</td>
<td>&lt;0.01</td>
</tr>
<tr>
<td>1-Year mortality</td>
<td>1437 (3.7)</td>
<td>224 (2.8)</td>
<td>1213 (3.0)</td>
<td>&lt;0.01</td>
</tr>
</tbody>
</table>

NNT~100

Should Radial Access be the gold standard in PCI?

Femoral: I C
Radial: I A

Future Recommendations?
AHA/ACC/ESC

Future Recommendations?
AHA/ACC/ESC

I

Evidence &/or Agreement (Beneficial, Useful, Effective)

II

Conflicting Evidence Divergence of opinion (Usefulness, Efficacy)
II a weight in favor
II b less well established

III

Evidence &/or Agreement Not Useful/Effective Potentially Harmful

A. Multiple randomized trials or meta-analyses
B. Single randomized trial or non-randomized studies
C. Only consensus opinion of experts, case studies or standard of care
**Tips and tricks for stenting: Guide catheter size**

**5 Fr** simple procedures

- ‘+’ ve - direct stenting / reduced bleeding
- ‘-’ ve - ↑ risk air embolus / IVUS won’t go

**6 Fr** simple or complex procedures

- may accommodate 2 balloons
  (selected manufacturers)

**≥7 Fr** complex procedures

- bifurcations, rotational atherectomy
- blood loss - consider hemostasis valve

---

**Stenting tips and tricks: Guide catheter choice**

**LCA**

- specialized guide catheters appropriate for artery: XB LAD vs. EBU or AL for Cx
- left main length (short = less aggressive guide)

**RCA**

- take-off superior vs horizontal vs inferior
- avoid side-hole catheters as pressure may falsely disguise wedging and vessel injury
Stenting strategy

<table>
<thead>
<tr>
<th>Lesion characteristics</th>
<th>Direct stenting</th>
<th>Predilation + stenting</th>
</tr>
</thead>
<tbody>
<tr>
<td>Non-ostial</td>
<td>Non-ostial</td>
<td>Ostial</td>
</tr>
<tr>
<td>Uniform</td>
<td>Uniform</td>
<td>Non-uniform</td>
</tr>
<tr>
<td>Non-calcified</td>
<td>Non-calcified</td>
<td>Calcified</td>
</tr>
<tr>
<td>Acute lesion (thrombectomy)</td>
<td>Acute lesion (thrombectomy)</td>
<td>Occluded</td>
</tr>
<tr>
<td>Simple</td>
<td>Simple</td>
<td>Complex (long, bifurcations)</td>
</tr>
</tbody>
</table>

Stenting in acute MI

• Ensure wire is endoluminal
• If thrombus present – aspirate; medicate
• Occluded artery - establish antegrade flow by predilation
• Direct stent only if lesion adequately visualized
• Post-dilate, only if necessary
Direct stenting in acute MI

**Appropriate**

- Ensure wire is endoluminal
- If thrombus present – aspirate; medicate
- Occluded artery - establish antegrade flow by predilation
- Direct stent only if lesion adequately visualized
- Post-dilate, only if necessary

**Not appropriate**
Risk of stent thrombosis

- SCAI
- CCI 2007

TABLE II. Patient and Lesion Features Associated with Increased Risk of Drug-Eluting Stent Thrombosis

<table>
<thead>
<tr>
<th>Patient Feature</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dual antiplatelet discontinuation</td>
</tr>
<tr>
<td>Diabetes</td>
</tr>
<tr>
<td>Acute coronary syndrome/myocardial infarction</td>
</tr>
<tr>
<td>Low ejection fraction</td>
</tr>
<tr>
<td>Renal failure</td>
</tr>
<tr>
<td>Lesion Feature</td>
</tr>
<tr>
<td>Bifurcation</td>
</tr>
<tr>
<td>Longer stent length</td>
</tr>
<tr>
<td>Residual dissection</td>
</tr>
<tr>
<td>Small stent diameter and/or severe under expansion</td>
</tr>
<tr>
<td>Stent malapposition</td>
</tr>
</tbody>
</table>

NNT~100

TRI save lives?

Association of the arterial access site at angioplasty with transfusion and mortality: the M.O.R.T.A.L study (Mortality benefit Of Reduced Transfusion after percutaneous coronary intervention via the Arm or Leg)

A J Chase,1,2 E B Fretz,3 W P Warburton,3 W P Klinke,3 R G Carere,4 D Pl,5 B Berry,2 J D Hilton2

<table>
<thead>
<tr>
<th>Outcomes</th>
<th>Whole sample (n = 38 872)</th>
<th>Radial cases (n = 7972)</th>
<th>Femoral cases (n = 30 900)</th>
<th>p Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Received transfusion</td>
<td>967 (2.5)</td>
<td>108 (1.4)</td>
<td>859 (2.8)</td>
<td>&lt;0.01</td>
</tr>
<tr>
<td>30-Day mortality</td>
<td>598 (1.5)</td>
<td>78 (1.0)</td>
<td>520 (1.7)</td>
<td>&lt;0.01</td>
</tr>
<tr>
<td>1-Year mortality</td>
<td>1437 (2.7)</td>
<td>224 (2.8)</td>
<td>1213 (3.9)</td>
<td>&lt;0.01</td>
</tr>
</tbody>
</table>

NNT~100
SFL Egypt

• We fully realize we are not reinventing the wheel, but simply trying to catch up.
• Applying EBM and continuous quality control aiming at improving treatment times and adherence to EBT is crucial for success.

Conclusion

• The key issue is to improve the patient pathway to ensure good DBT.
• Go radial (only if experienced)
• Aspirate when necessary (Total occlusion, visible thrombus..)?
• Use EBM & Plan, plan, plan (Guide catheter, wires, drugs, closure devices), failing to plan is planning to fail.
• Know how to manage no reflow.
No Reflow

- Avoid Avoid Avoid.
- Once occurs be ready to manage with drugs: Adenosine, Nitroprusside, Verapamil...
- Be ready to support IABM...
- Do not leave the cath lab with no reflow.

THANK YOU