Prophylactic Circulatory Support During PCI Clinical Cases

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Relevant Disclosures:
Research Support: Cardiac Assist, Abiomed, Maquet, Heartware
Consultant/Speaker: Cardiac Assist, Abiomed, Maquet, Thoratec

We will be discussing off-label uses and investigational devices.
Case One

59 year old man with hypertension, dyslipidemia, Type II diabetes, and an ischemic cardiomyopathy (LVEF of 20%) presents with intermittent chest pain at rest. Anterior ischemia by nuclear stress study.

Baseline NYHA Class II, Stage C heart failure.
BMI: 34.8
Creatinine: 1.8

EuroScore CABG Mortality Risk: 23%
Mayo Clinic PCI Mortality Risk: 5.9%
Case One: Baseline Angiography
Case One: Clinical Evaluation

Patient:
Diabetic
Renal Insufficiency
LV dysfunction
HF symptoms

Coronary:
Focal LAD target
3-vessel disease

Clinical:
No active ischemia
No cardiogenic shock
How would you manage Case 1?

1. No percutaneous support device.

2. IABP

3. Impella CP

4. TandemHeart pLVSD

<table>
<thead>
<tr>
<th>Pre-PCI Hemodynamics</th>
<th>Option 1</th>
<th>Option 2</th>
</tr>
</thead>
<tbody>
<tr>
<td>RA</td>
<td>14</td>
<td>10</td>
</tr>
<tr>
<td>PA</td>
<td>46/24</td>
<td>40/18</td>
</tr>
<tr>
<td>PCWP</td>
<td>27</td>
<td>16</td>
</tr>
<tr>
<td>SVO2</td>
<td>53%</td>
<td>60%</td>
</tr>
<tr>
<td>CI</td>
<td>1.8</td>
<td>2.2</td>
</tr>
</tbody>
</table>
How would you manage Case 1?

1. No percutaneous support device. Diurese first.

Focal LAD lesion.
No active ischemia.

Underwent PCI without mechanical support.

<table>
<thead>
<tr>
<th></th>
<th>Initial Values</th>
<th>Pre-PCI</th>
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Case Two

- 65 year old man with hypertension, dyslipidemia, Type II diabetes, and new onset chest pain ruled in for a Non-STEMI. Currently pain free.
- No heart failure symptoms at baseline.
- LVEF: 30%
- BMI: 36.0
- Creatinine: 0.9
- EuroScore CABG Mortality Risk: 9.1%
- Mayo Clinic PCI Mortality Risk: 2.2%
Case Two: Baseline Angiography

Patient refusing CABG.
Case Two: Clinical Evaluation

**Patient:**
- Age
- Diabetic
- LV dysfunction

**Coronary:**
- Focal LAD target
- Focal RCA target
- Diffuse OM disease

**Clinical:**
- Active ischemia (NSTEMI)
- No cardiogenic shock
How would you manage Case 2?

1. No percutaneous support device.

2. IABP

3. Impella CP

4. TandemHeart pLVSD

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<td>PA  37/20</td>
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<tr>
<td>PCWP 23</td>
</tr>
<tr>
<td>SVO2 55%</td>
</tr>
<tr>
<td>CI  2.4</td>
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</table>
How would you manage Case 2?

1. No percutaneous support device.
2. IABP
3. Impella CP
4. TandemHeart pLVSD

<table>
<thead>
<tr>
<th>Condition</th>
<th>Systolic</th>
<th>Diastolic</th>
<th>Mean</th>
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</thead>
<tbody>
<tr>
<td>Baseline</td>
<td>150</td>
<td>74</td>
<td>102</td>
</tr>
<tr>
<td>Impella P8</td>
<td>170</td>
<td>86</td>
<td>116</td>
</tr>
<tr>
<td>P8 post LAD PCI</td>
<td>171</td>
<td>83</td>
<td>116</td>
</tr>
<tr>
<td>Impella P2 (wean)</td>
<td>165</td>
<td>79</td>
<td>109</td>
</tr>
</tbody>
</table>
Case Three: Baseline Angiography

- 69 year old woman with hypertension, dyslipidemia, Type II diabetes, prior inferior-wall myocardial infarction and new onset chest pain ruled in for a Non-STEMI. Intermittent CP at rest.

- Class II, Stage B heart failure (LVEF 30%).
- BMI: 32.0
- Creatinine: 1.3

- EuroScore CABG Mortality Risk: 17.7%
- Mayo Clinic PCI Mortality Risk: 2.2%
Case Three: Baseline Angiography
Case Three: Clinical Evaluation

Patient:
Age
Diabetic
LV dysfunction

Coronary:
3-vessel disease
Focal ostial LM target

Clinical:
Active ischemia (NSTEMI)
No cardiogenic shock
How would you manage Case 3?

1. No percutaneous support device.

2. IABP

3. Impella CP

4. TandemHeart pLVSD

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Case Three: Clinical Evaluation

RFA

LFA
How would you manage Case 3?

1. No percutaneous support device.

2. IABP

3. Impella CP

4. TandemHeart pLVSD

| Hemodynamics |  
|--------------|---|
| Baseline     |   |
| RA           | 14 |
| PA           | 59/25 |
| PCWP         | 25 |
| SVO2         | 62% |
| CI           | 2.9 |
Intra-procedural Hemodynamics

IABP Supported LM PCI

Balloon Inflation
How would you manage Case 3?

1. No percutaneous support device.

2. IABP

3. Impella CP

4. TandemHeart pLVSD

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<td>3.0</td>
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Key Points:

• The definition of High risk PCI is a moving target.

• Appropriate patient-device matching requires:
  1. A careful assessment of pre-procedural hemodynamics
  2. Anticipated need for intra-procedural support

• Intra-procedural hemodynamic indices guide device application in AMI-Shock.