Cardiogenic shock and Impella

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Impella: temporary, continuous-flow, LV assist device

Percut. Surgical (axillary)
Impella Platform

Impella 2.5
510(k) Clearance, CE

Impella CP
510(k) Clearance, CE

Impella 5.0 / LD
510(k) Clearance, CE

Impella Devices
2.5 - 9F ID, 11F OD
4.0 - 14F ID, 16F OD
5.0 - 21/22F OD

Automated Impella Controller: AIC

9 Fr
2.5
5.0
14 Fr
18 Fr
11 Fr

jeudi 16 mars 17
« Cardiogenic Shocks are not created equal »

Table 1. INTERMACS: Profiles for Patient Selection

<table>
<thead>
<tr>
<th>Profile Description</th>
<th>Temporary circulatory support (TCS)</th>
<th>Arrhythmia (A)</th>
<th>Frequent flyer (FF)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Critical cardiogenic shock</td>
<td>X</td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>2. Progressive decline on inotropic support</td>
<td>X</td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>3. Stable but inotropic dependent</td>
<td>X (in hosp)</td>
<td>X</td>
<td>X (if home)</td>
</tr>
<tr>
<td>4. Resting symptoms home on oral therapy</td>
<td>X</td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>5. Exertion intolerant</td>
<td>X</td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>6. Exertion limited</td>
<td>X</td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>7. Advanced NYHA Class III symptoms</td>
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NYHA, New York Heart Association Classification.

Which goals for temporary circulatory support ?

1- Adequate organ perfusion
   «Break the vicious circle »

↑ QC ↑ Coronary & organ perfusion

2- Unload LV, help recovery

↓ MvO2

3- Time ...

- To assess (neurological recovery after OHCA )
- To bridge (to recovery, to transplant, to LVAD...)
ECMO A-V

- Rising interest
- Rapidly deployable
- Percutaneous
- Easy transfer

Qc 4-5 l/mn
Oxygénation
BiV support
Not rythm dependant

1- Adequate organ perfusion
   «Break the vicious circle »

2- Unload LV , help recovery
3- Time ...

Large vascular sheath (18-23 Fr)
Reperfusion Lower limb
Perfusionnist
↑ LV Post load
Impella

Qc 2.5/3.5 (percut)- 5 l/mn (surg.)
Femoral/axillary/aortic
12 fr - 14fr-18fr
Up to 21d (surg)
Mobilisation

No RV support
Rythm dependant
No oxygenation
Hemolysis

1- Adequate organ perfusion
«Break the vicious circle »
2- Unload LV , help recovery
3- Time ...
Can one size fits all? a shock team approach!

In 2016 2/3 patients (n=28) referred to our institution were transferred.

- Typically, young, anterior STEMI, late presenters, transferred H12-H24 initial admission.
- Most of patients were Intermacs 2 «sliding fast» > Intermacs 1.
- Lack of strong recommendation in the field of TCS.

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- Cath lab /ICU /No surgery
- Cardiac surgery LVAD/heart transplant

« Cardiogenic Shocks are not created equal »

Not All Shock Is Created Equal


"Crash and Burn"  
"Sliding Fast"

Crash & Burn  
Diagnosis is obvious!

Sliding Fast (diagnosis requires careful monitoring and evaluation)

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**ECMO**  

**Impella 5.0**
Hybrid approach

- Mr B 42 y.o. patient
- Chest pain and FMC at H8
- NSTEMI / diffuse ST depression
- VF during transport ...

- On arrival TA 8/7 CP 105/mnsat 80% under O2
- Immediate I/V and subsequent collapsus
- «shock team» alert
- Transfer to the cathlab
Left main thrombosis
ECMO A-V percutanée

20 mn Low Flow ph 7,2 lactates 5 mmol/l

jeudi 16 mars 17
«Shock team» : Hybrid circulatory support ECMO + Impella 5.0 (axillary)
10 G/kg/mn Dobutamine
LVEF 15%
«Bridge» patient!
Minimal $\varnothing$ 8-10 mm

Courtesy L. Barandon
• ECMO weaning D4
• Extubation D7
• Impella 5.0 weaning D12
  • (Median 7 days Max 47 days!)
• LVEF 30 %, 45% at 6 months
Take home message

- TCS : patients often need > 1 week
- Impella 5.0 provides full LV support, time for evaluation (CE mark 21 days) with a minimally invasive approach
- ECMO and Impella are complementary!
  - Intermacs 1 : ECMO
  - Intermacs 2 with RV+/Lung+ : Impella 5.0
- Shock team with dedicated cardiac surgeon
Thank You !
Impella 5.0