Vascular Complications of VA ECMO

Advances in Cardiopulmonary Support for the Critically Ill Adult Conference
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Abbott Experience:
Vascular Catastrophe:
- Amputations in five of the first 68 patients
- High incidence of compartment syndrome
- What was going on?

Retrospective study revealed
- Best predictor of leg ischemia: Regional sats
- Prompted protocol for:
  - Education regarding regional sats
  - Early calls to vascular surgery service
  - Routine placement of antegrade perfusion catheters
  - Routine measurements of CK levels
  - Decrease in cannula sizes when possible

Since these changes have been instituted the incidence in compartment syndrome and amputation rates has...
Since these changes have been instituted the incidence in compartment syndrome and amputation rates has... 

...not changed much

Why?

Cocoanut Grove fire impact on healthcare

- Fundamental shift in the fluid management of burns
- Aggressive use of plasma resuscitation
- First use of penicillin in the civilian population
- Changes in the psychologic treatment of burn victims and further understanding of post traumatic stress disorder

But the most important impact may have been...
TAKE HOME MESSAGES

- ACCESS/DEVICE PLACEMENT IS IMPORTANT
- LIMBS QUICKLY BECOME NON-SALVAGEABLE WHEN PERFUSION IS COMPROMISED

Case 1

- 21 year old with Aortic root enlargement
- Replacement of root as well mechanical valve
- Post operative LV dysfunction, shock, CPR with ROSC
- Cath lab shows open coronaries
- Chest reopened with improvement in hemodynamic but no cause identified. ECMO placed, chest closed. Transferred to Abbott.
- Arrives with ischemic left leg and evidence of compartment syndrome

“excellent flow...”
Case 2

- 31 year old female with history of Addison’s disease was found unresponsive by family at home. Unknown down time
- Transported to hospital for resuscitation. Normal coronary angiogram. Right groin access for IABP, left groin access for VA ECMO, transferred to Abbott
- Arrives with cold right leg and evidence of compartment syndrome
- Bedside fasciotomies performed
- Taken to OR for evaluation of right leg perfusion
“but with blast shield down I can’t see anything…”

-Juke Skywalker: A long time ago in a galaxy far, far away

Most Consecutive (Blindfolded)
- 88 (Fred Neuman)

1 minute (blindfolded)
- 17 (Ed Palbinskas)

Free throw records
- Most Consecutive
  - 5221 (Ted St. Martin)
  - 24 hours
  - 20,371/22,043 (Fred Neuman)
- 1 minute
  - 50/59 (Bob J. Fisher)

- Post procedural bleeding from fasciotomy sites
- Unclear impact of leg ischemia on systemic fragility
- Not ready for removal of VA ECMO circuit

Dry ice cryoamputation: A twelve-year experience
- Robert H. Hamburger, M.D., John A. Schwartz, M.D., Rob A. Kugy, M.D.,
  Mandleshoth, M.D., and George Johnson, Jr., M.D.,
  Mayo Clinic, Rochester, Minnesota.

- 56 patients (16 AKAs, 41 BKAs)
- Mortality 14% (without ice)

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Case 3

- 59 year old female presents to outside hospital with dyspnea.
- Found to have EF 10%. Normal coronary arteries.
- IABP placed followed by Impella device and then transfer to Abbott following placement of VA ECMO cannula in the left groin.
- Patient arrives with cold left leg, decreased regional sats (89 on the right, 47 on the left). Minimal flow identified in left leg by ultrasound.

Conclusions

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<th>GPA</th>
<th>Limbs</th>
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<tbody>
<tr>
<td>4.0</td>
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</tr>
<tr>
<td>3.5</td>
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</tr>
<tr>
<td>3.0</td>
<td>Not Good</td>
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<td>2.0</td>
<td>Not Good</td>
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<tr>
<td>1.0</td>
<td>You're Going Nowhere</td>
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