Current Status of Ischemic Priming to decrease SCI with TAAA Repairs—Status of MIS²ACE and studies to Evaluate it: The PAPA-artis Trial

Christian D. Etz

The author declares no conflict of interest

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What is staged ‘segmental artery’ occlusion?

MIS²ACE

- Locating & intubating segmental artery -

- Coils application -

- Occlusion assessment -
Rationale for MIS²ACE

The Collateral Network Concept

Evidence for MIS²ACE

The staged repair

Clinical evidence for MIS²ACE
Staged repair significantly reduces paraplegia rate after extensive thoracoabdominal aortic aneurysm repair

Open surgery, staged repair:
SCI reduction from 15% to 0%

Endovascular, staged Repair
SCI reduction “10fold” — from 25% to 2.4%

MIS²ACE is very promising, but level A evidence is required and the iatrogenic risk is unknown  ➔ RCT
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Experimental Optimization of MIS²ACE
Regional-pattern (group 1)  
N = 6

Stage 1  
Lumbar  
(10 segmental arteries)

Stage 2  
Thoracic  
(20 segmental arteries)

Intervention Groups

Alternating-pattern (group 2)  
N = 6

Stage 1  
Every second artery  
(15 segmental arteries)

Stage 2  
Remaining arteries  
(15 segmental arteries)

Intervention Groups

Watershed-pattern (group 3)  
N = 6

Stage 1  
Thoracic level 12 to lumbar 2  
(8 segmental arteries)

Stage 2  
Remaining arteries  
(22 segmental arteries)

Intervention Groups

Results - Neurological Outcome and Spinal Cord Tissue Damage

<table>
<thead>
<tr>
<th>MIS/ACE occlusion pattern</th>
<th>Regional</th>
<th>Alternating</th>
<th>Watershed</th>
<th>Control</th>
</tr>
</thead>
<tbody>
<tr>
<td>temporary</td>
<td>1 (16.7%)</td>
<td>1 (16.7%)</td>
<td>3 (50%)</td>
<td>7 (100%)</td>
</tr>
<tr>
<td>permanent</td>
<td>0 (0%)</td>
<td>1 (16.7%)</td>
<td>1 (16.7%)</td>
<td>4 (57%)</td>
</tr>
<tr>
<td>all</td>
<td>1 (16.7%)</td>
<td>2 (33.3%)</td>
<td>4 (66.7%)</td>
<td>7 (100%)</td>
</tr>
</tbody>
</table>

* P-Value < 0.05 versus control

significantly less neurological deficits for regional pattern

no neurological deficits for watershed pattern after stage 1

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<tbody>
<tr>
<td>Tissue damage (N, %)</td>
<td>score ≥6</td>
<td>0 (0%)*</td>
<td>2 (16.7%)</td>
<td>5 (71.4%)</td>
</tr>
</tbody>
</table>

* P-Value < 0.05 versus control

No relevant tissue damage in staged regional pattern

Score 0 - intact  
Score 8 - damaged