Principle of spinal cord protection in open and endovascular TAA/A repair: from bench to bedside

Christian D. Etz
Heisenberg Professor of Aortic Surgery
… ’In patients with TAAA, [...] spinal cord perfusion depends on an eminent collateral network.’
staged segmental artery occlusion

EXPERIMENTAL EVIDENCE
Total segmental artery occlusion: regeneration of arterial perfusion within 5 days

*staged = 100% recovery*

clinical implication

STAGED REPAIR
(Unplanned) extensive staged segmental artery sacrifice = 100% recovery!
> 10fold reduction in SCI rate with *staged* endovascular repair
new 'staging' technology: 'PRIMING' the COLLATERAL NETWORK
Rationale for staged repair / MIS²ACE: Priming of the Collateral Network
First-in-man endovascular preconditioning of the paraspinal collateral network by segmental artery coil embolization to prevent ischemic spinal cord injury

Christian D. Etz, MD, PhD, a E. Sebastian Debus, MD, PhD, b Friedrich-Wilhelm Mohr, MD, PhD, a and Tilo Kölbel, MD, PhD b
Minimally Invasive Segmental Artery Coil Embolization (MISACE)

- First Stage -
MIS²ACE

1. staged priming (within PAPAartis RCT)
2. 1-3 sessions
3. reduced steal / clean OR field / shorter OR times
4. reduction of type II endoleakage after endo repair
MIS$^2$ACE: safety

Spinal cord damage was most prominent in the T9–T13 region. Almost no necrosis is seen in the coiled region (T11-L3) for Group 2.

Geisbüsch et al.

no histologic damage in coiled areas
Evolution of MIS²ACE


NIH  DFG  Horizon 2020

PAPAartis
fighting spinal cord injury

CN concept  →  staged repair  →  MIS²ACE  →  Proof-of-Concept  →  ESC/ECTS  →  international RCT

3 year duration  300 participants  33 recruiting sites in 9 countries
The RCT

PAPAartis
fighting spinal cord injury
... largest publicly funded RCT in aortic aneurysm repair

17 (+14) Aortic Reference Centres

prospectively collect contemporary real-world data on SCI incidence (type II, III; open + endo)

comparing 'staged' vs. 'conventional' approach

evaluating effectiveness of MISACE:
   – SCI protection & endoleak type II prevention
This project has received funding from the European Union’s Horizon 2020 research and innovation programme under grant agreement No 733203 and the German Research Foundation.

Recruiting now!

- 5 year duration
- 500 participants
- 31 recruiting sites in 9 countries

Recruiting now!
Principle of spinal cord protection in open and endovascular TAA/A repair: from bench to bedside

Christian D. Etz
Heisenberg Professor of Aortic Surgery