Optimal approaches to decrease SCI after TEVAR and open TAAA repair

Spinal cord ischemia and open surgery
- Open surgery
  - aortic cross clamping
  - exclusion aortic segments, intercostal arteries
  - backbleeding segmental arteries
  - occluded lumbar and hypogastric arteries
  - occluded left subclavian artery
  - embolization
  - hemodynamic instability
  - ischemia-reperfusion injury
  - Inflammatory processes

Spinal cord ischemia and TEVAR
- Endovascular surgery
  - overstenting critical segmental arteries
  - exclusion additional aortic segments for sealing
  - occluded lumbar and hypogastric arteries
  - occluded left subclavian artery
  - embolization
  - hemodynamic instability

TAAA: Open versus Endo
- Paraplegia rate significantly higher after endovascular repair!
Occluded intercostal arteries

Spinal cord ischemia

electrical stimulation
300 V; ~1.2 A, 5 serial stimuli

Comparison of magnetic resonance with computed tomography angiography for preoperative localization of the Adamkiewicz artery in thoracoabdominal aortic aneurysm patients

Comparison of magnetic resonance with computed tomography angiography for preoperative localization of the Adamkiewicz artery in thoracoabdominal aortic aneurysm patients

Comparison of magnetic resonance with computed tomography angiography for preoperative localization of the Adamkiewicz artery in thoracoabdominal aortic aneurysm patients
In post-dissection TAAA, (almost) all intercostal and lumbar arteries are patent (true > false lumen).

In post-dissection TAAA, the AKA receives direct segmental blood supply in 86% of patients.

Less collateral pathways.

In degenerative TAAA the majority of intercostal and lumbar arteries are occluded.

In degenerative TAAA the AKA receives direct segmental blood supply in only 46% of patients.

Collateral network.

Indirect SA connection via collateral pathway.
Spinal cord perfusion is highly variable and unpredictable, especially in degenerative TAAA: MEP is an accurate technique to assess spinal cord ischemia. Anatomical information does most often not correlate with spinal cord function. Open and endovascular exclusion of aortic segments should preferably be performed in sequential steps.