

# **Aneurysm sac volume and spinal cord ischemia in patients with thoracoabdominal aortic aneurysms treated with branched stent-grafts using the temporary aneurysm sac perfusion - technique**

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# BEVAR

- + Mortality: 6 – 9%
- + Paraplegia: 4 – 25%
- + Preventive measures
  - + Cerebrospinal fluid (CSF) drainage
  - + Haemoglobin >9 g/dl
  - + Mean arterial pressure (MAP) > 80 mm Hg

# Temporary aneurysm sac perfusion (TASP)

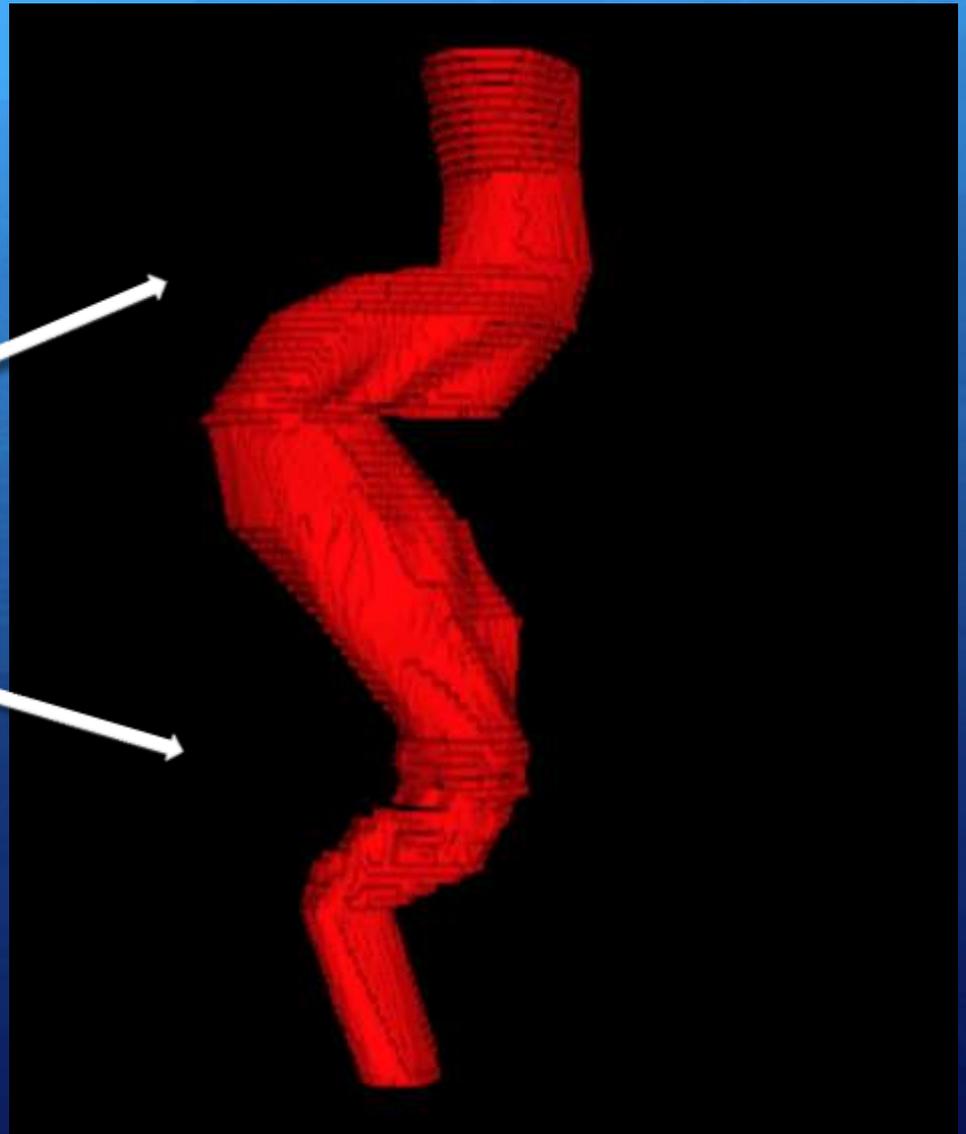
- + 2- staged therapy
- + Open branch concept
- + Paraplegia rate: 21% vs. 5%
- + Non-completion → maintain spinal cord perfusion
  - + Prevent aneurysm sac thrombosis
  - + Patent intercostal and/or lumbar arteries

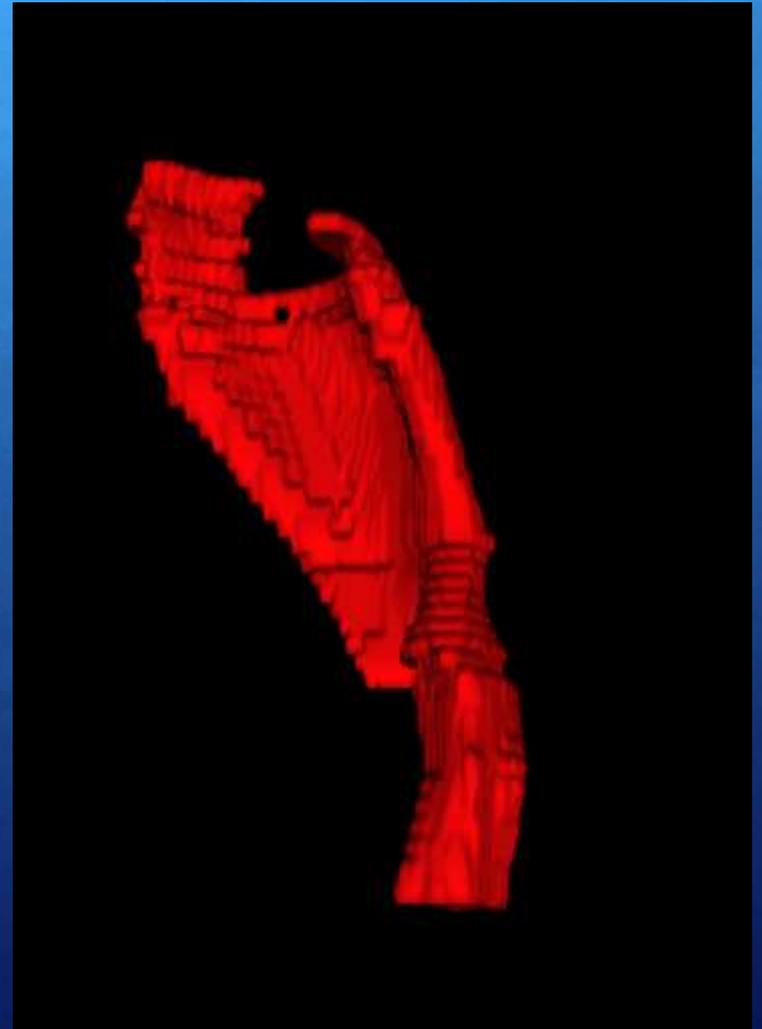
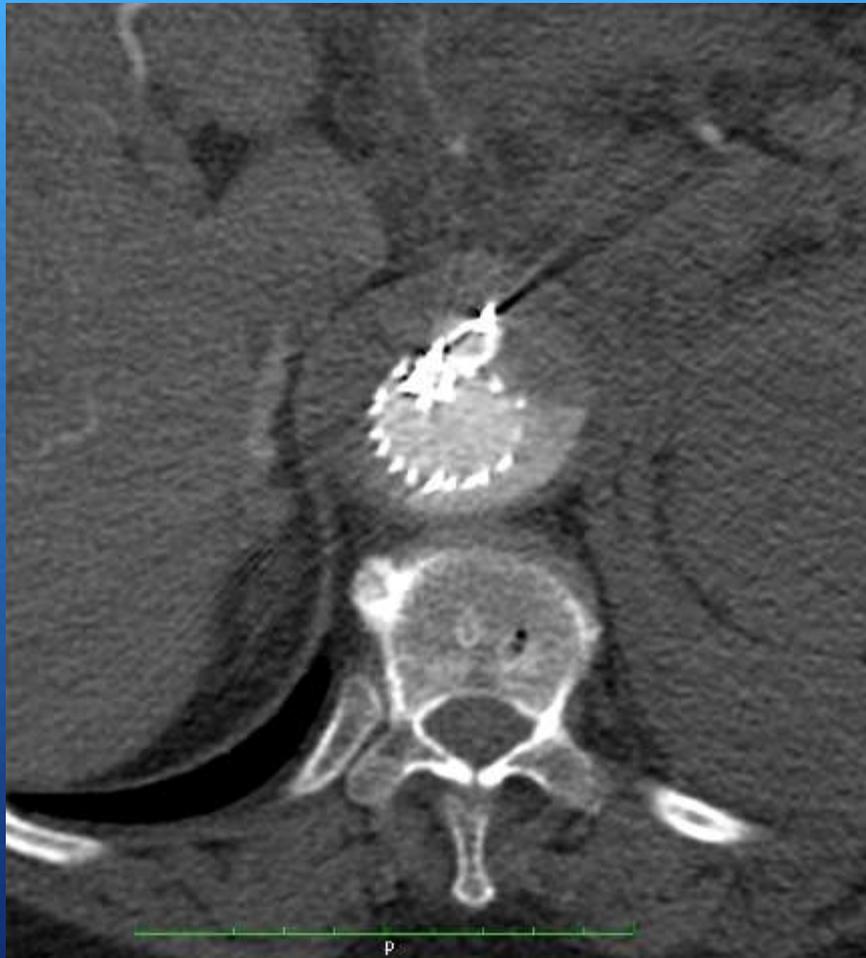
# Aneurysm sac volume

- + The changes of the sac volume during the endovascular therapy and its influence on neurologic outcome.
- + Sac volume measurements in patients with TAAA treated with BEVAR in a single step compared with patients treated with the TASP-technique.
  - + Analysis → pre- and post-operative CTAs of all patients with TAAA that underwent BEVAR
  - + period April 2010 – September 2015 in our department.

# Aneurysm sac volume

- + Evaluated outcomes included:
  - + total aneurysm volume (TAV),
  - + contrasted aneurysm volume (CAV) preoperatively, during the TASP interval and postoperatively,
  - + rate of severe spinal cord ischemia (SCI).
- + Measurements were carried out by two independent investigators using dedicated software (Osirix<sup>®</sup>)





# Results

- + 82 patients were treated with BEVAR for TAAA
  - + 45 patients in the TASP group and 37 in the group receiving single step treatment.
  - + 52 men; median age 69.6 years, range 31-92.
- + The groups were comparable regarding preoperative comorbidities, aneurysm type and the extent of the endovascular procedure.

# Results

- + 11 patients developed severe SCI postoperatively, classified according to a modified Tarlov's scale.
- + The use of the TASP technique was associated with significantly lower rates of postoperative SCI
  - + 8 in single step group vs. 3 in open branch group;  $p=.049$
- + In both groups total aneurysm volume (TAV) was dependent on the type of TAAA ( $p=.001$ ).

# Results

- + Contrast Aneurysm Volume (CAV) during the TASP interval was significantly lower in comparison to the preoperative CAV
  - + 67 vs. 327 ml;  $P < 0.001$ .
- + Endoleak was observed in 23 patients (9 in single step vs. 14 in open branch).
  - + Mean endoleak volume was 9.7 ml.
- + Even in the presence of endoleak, CAV after TASP completion was significantly lower in comparison to the TASP interval.
- + Neither the presence of endoleak nor its volume was correlated with the prevention of severe SCI.

# Conclusion

- + According to volumetry:
  - + CAV during the TASP interval is significantly reduced in comparison to the preoperative CAV
  - + but also significantly higher in comparison to the CAV after treatment completion.
- + This can possibly explain the preventive role of TASP in SCI, through a reduced but preserved aneurysm perfusion during the TASP interval, preconditioning collateral pathways to the spinal cord.
- + Endoleak plays no role in the prevention of severe SCI.