Klinikum rechts der Isar
Technische Universität München

VEITH SYMPOSIUM
Connecting The Vascular Community
51st
Tuesday – Saturday, November 19-23, 2024

Extensive Single Center Clinical Experience With Intercostal Coil Embolization (MIS2ACE) To Prevent SCI With Endovascular TAAA Repair: How And When To Do It? Why We Still Need An RCT?

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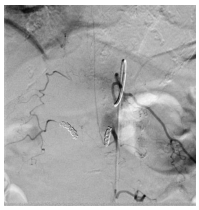
Disclosure

- I have the following potential conflicts of interest to report:
  - Grants and Speaking Fees from:
    - Artivion
    - DB
    - Cook Medical
    - Getinge
    - Endologix
    - Medtronic
    - Terumo Aortic

Minimal Invasive Segmental Artery Coil Embolization (MISACE) in EVAR

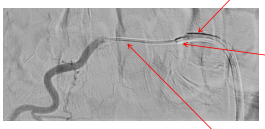
- an endovascular first stage of a "staged approach" for TAAA repair to reduce SCI
- based on the collateral network concept of the blood supply for the spinal cord
- aims to occlude the segmental artery main stem, thus possibly stimulating the collateral network to build new arterioles and recruit larger preexisting arteries

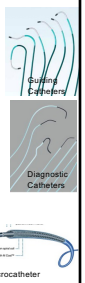


Geisbüsch S et al. Thorac Cardiovasc Surg. 2014
3 Etz CD et al. J Thorac Cardiovasc Surg. 2015

MISACE – Procedure Cannulation of the SA

- local anesthesia
- percutaneous trans-femoral access with a 5Fr Sheath
- no CSF drainage
- clinical monitoring of the patients' neurologic function for at least 48h after the procedure





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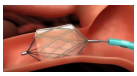
MISACE – Procedure Occlusion of the Ostial Segment of SA

'Standard'-Coils

3-D / Volume-Coils

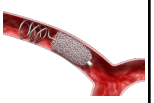
e.g. Penumbra 400 Coil

MVP (Medtronic)



0.021" ID-compatible

IMPEDE® Embolization Plug



Shape Memory Polymer
4F (.038" min ID)

No particles or fluids (CAVE: distal embolization)

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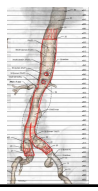
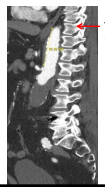
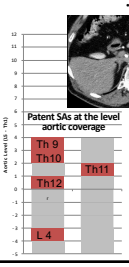
MISACE - Planning

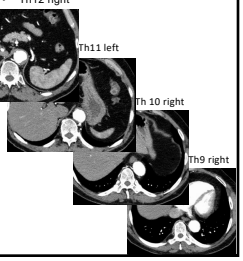
- Location of all patent SAs on the CTA in the aortic area planned to covered by the stentgraft



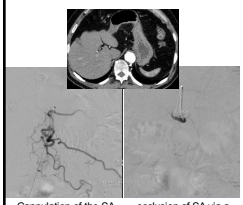




- Th12 right

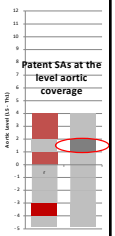


MISACE – Procedure: Coiling of SA Th11l

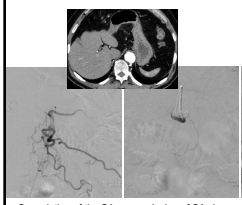


Cannulation of the SA **Th 11 left** SIM-1 Catheter

occlusion of SA via a Microcatheter (Progreat 2.7F) with pushable Coils (4x3.7mm, 3x3.3mm)



MISACE – Procedure: Coiling of SA Th11l, Th12r

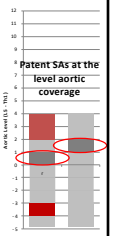


Cannulation of the SA **Th 11 left** SIM-1 Catheter

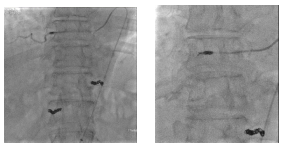
occlusion of SA via a Microcatheter (Progreat 2.7F) with pushable Coils (4x3.7mm, 3x3.3mm)

Cannulation of the SA **Th12 right** with SIM-1 Catheter

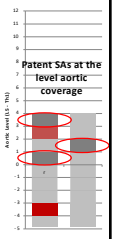
occlusion of SA via a Microcatheter (Progreat 2.7F) with Coils (one of 5x5.5mm, four of 6x6.7mm)



MISACE – Procedure: Coiling of SA Th9r



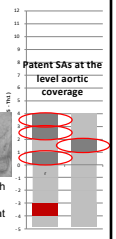
Cannulation of SA **Th9 right** with SIM-1 Catheter and occlusion of the vessel with seven Coils via a Microcatheter (Progreat 2.7F)



MISACE – Procedure: Coiling of SA Th10r

cannulation of the SA at the Level of **Th10** using a diagnostic and a guiding catheter

occlusion of the SA with eight Coils via a Microcatheter (Progreat 2.7F)



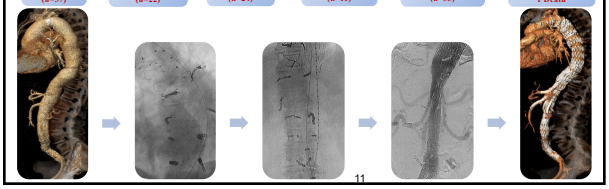
Ischaemic preconditioning of the spinal cord to prevent spinal cord ischaemia during endovascular repair of thoracoabdominal aortic aneurysm: first clinical experience

Endovascular occlusion of segmental arteries feeding the anterior spinal artery to stage endovascular thoracoabdominal aortic repair

Branzan D, et al. JTCVS Open. 2024 Feb 29;18:1-8

Daniela Branzan, MD, PhD,[a,b] Antonia Geisler, MD,[a] Sabine Steiner, MD, PhD,[b,c] Dierk Scheinert, MD, PhD,[a] Katharina Funk, MD,[a] and Andrej Schmidt, MD, PhD[a]

TAAA	1. MISACE (Stage 1)	Optional 2. MISACE (Stage 2)	Optional >2. MISACE (Stage 3)	Endovascular Repair of TAAA (Stage 4)	30 Days Results
(n=57)	(n=22)	(n=24)	(n=11)	(n=55)	0 SCI, 1 Death



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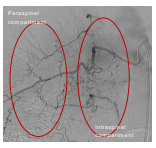
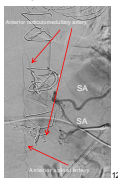
MISACE - Principle

- Based on the Collateral Network Concept of Spinal Cord Perfusion
- Causes the ischemic Preconditioning of the Spinal Cord

Prof. Griepp and Mount Sinai Group, New York





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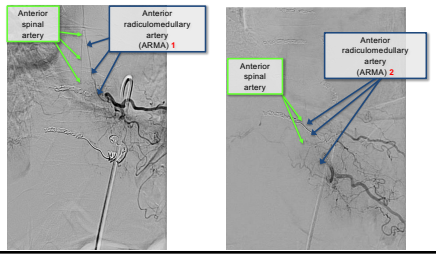
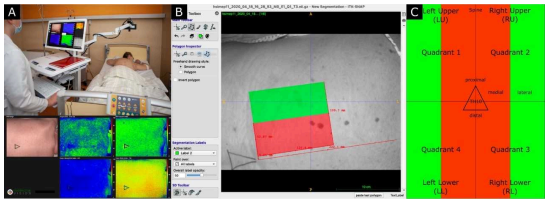
Spinal blood supply



MISACE – HIS for monitoring the collateral network



Branzan D, et al. The Annals: Under Review

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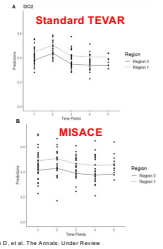
HSI after definitive ER of TAAA in the control group



- priming of the CN with a standard stentgraft (A) implantation did not cause the return of the StO2 values to the baseline as seen after the priming with MISACE (B)

Branzan D, et al. The Annals: Under Review

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Conclusion

- MISACE to precondition the paraspinous collateral network is clinically feasible and very encouraging regarding safety
- HSI can detect changes in tissues oxygenation above the paraspinous musculature after ER of TAAA
- Both methods of CN priming had no lasting effect on tissue oxygenation, suggesting their safety
- Tissue oxygenation significantly decreased after definitive ER of TAAA in the control group but not in the intervention group, demonstrating the efficacy of MISACE on priming the CN

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Open questions for MISACE

- What is sufficient coil embolization to prime the CN?
  - Always occluding?
  - Is reduction of flow sufficient?
  - Every patent segmental artery?
- At which level to start MISACE?
- How many SA per session to embolize?

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Thank you!

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