Clinic for Vascular Surgery and Phlebology
Institute for Vascular Research
Director: PD Dr. M. J. Austermann

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What Is The Muenster Strategy To Avoid SCI After F/B/EVAR For TAAA:

What Is The Proof That It Works

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Disclosure

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Speaker name:

I have the following potential conflicts of interest to report:

- ❑ Receipt of grants/research support
- ❑ Receipt of honoraria and travel support
- ❑ Participation in a company-sponsored speaker bureau
- ❑ Employment in industry
- ❑ Shareholder in a healthcare company
- ❑ Owner of a healthcare company

X ❑ I do not have any potential conflict of interest

The Münster strategy to avoid spinal cord ischemia during F/BEVAR

CMD-FEVAR for TAAA:

CMD-FEVAR in Dissection:

The Münster strategy to avoid spinal cord ischemia during F/BEVAR

Background

US – Aortic Research Consortium

CLINICAL RESEARCH STUDY | THORACOABDOMINAL AND COMPLEX AORTIC ANEURYSMS | VOLUME 77, ISSUE 6, P1578-1587, JUNE 2023

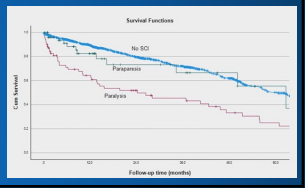
Predictors and outcomes of spinal cord injury following complex branched/fenestrated endovascular aortic repair in the US Aortic Research Consortium

Victoria J. Aucoin, MD • Claire M. Motyl, MD • Zdenek Novak, MD, PhD • Matthew J. Eagleton, MD • Mark A. Farber, MD • Warren Gasper, MD • Gustavo S. Oderich, MD • Bernardo Mendes, MD • Andres Schanzer, MD • Emanuel Tanoris, MD, MPH • Carlos H. Timaran, MD • Darren B. Schneider, MD • Matthew P. Sweet, MD • Sara L. Zettervall, MD, MPH • Adam W. Beck, MD +

on behalf of the U.S. Aortic Research Consortium • Show less

Published: April 12, 2023 • DOI: https://doi.org/10.1016/j.jvs.2023.01.035 •

FEVAR/BEVAR 2005-2020		n=1681
Any degree of SCI :	7,1%	n=120
Transient paraparesis:	3%	n= 50
Permanent paraplegia	4,2%	n=70



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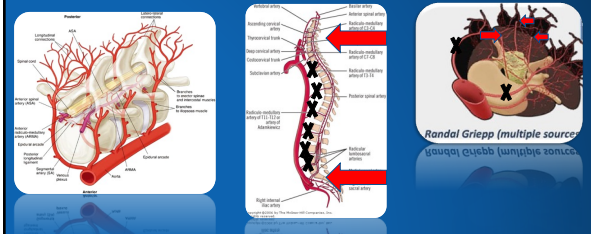
The spinal perfusion



Etz et al. J Thoracic Cardiovasc Surg 2011;141:1020-28

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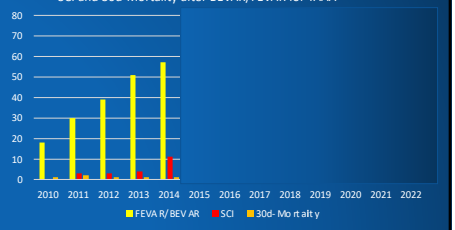
St. Franziskus Hospital Münster experience 2010 - TAAA

SCI and 30d-Mortality after BEVAR/FEVAR for TAAA



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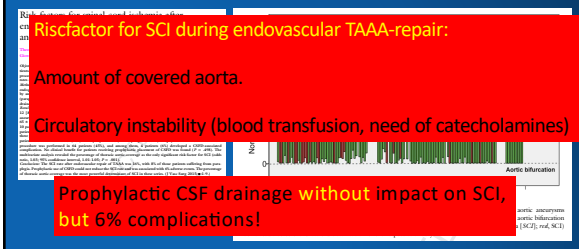
Münster results 2015



Riscfactor for SCI during endovascular TAAA-repair:

Amount of covered aorta.

Circulatory instability (blood transfusion, need of catecholamines)

Prophylactic CSF drainage without impact on SCI, but 6% complications!

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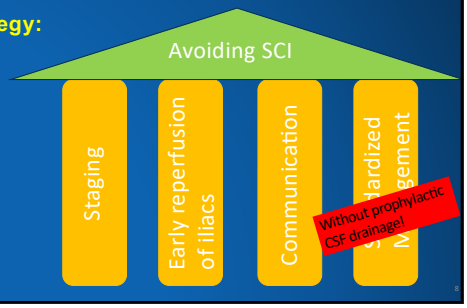
The Münster strategy to avoid spinal cord ischemia during F/BEVAR

Our strategy:



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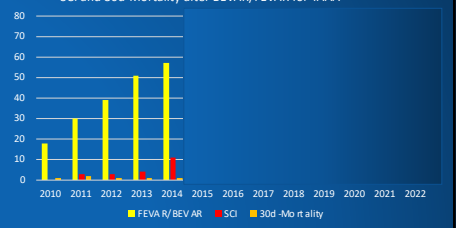
The Münster strategy to avoid spinal cord ischemia during F/BEVAR

St. Franziskus Hospital Münster experience 2010 - TAAA

SCI and 30d-Mortality after BEVAR/FEVAR for TAAA



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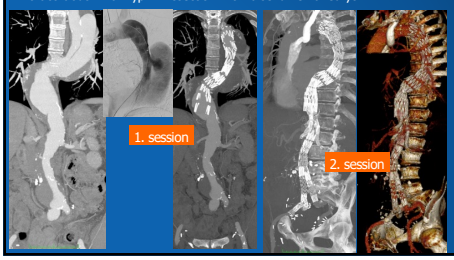
Solution 1: Staging

Thoraco-abdominal Typ B Dissection with false lumen aneurysm



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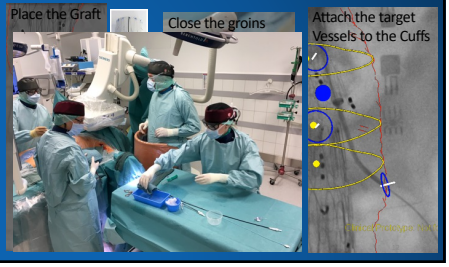
Solution 2: Early reperfusion of the iliacs



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The Münster strategy to avoid spinal cord ischemia during F/BEVAR

Solution 3: Communication

Operator – Anästhesiologist – Intensiv care unit

About:

Amount of aortic coverage
Blood loss
Special risks: Occlusion of the hypogastric arteries
Subclavian occlusion
Amount of intercostals

Post-operative visit of the operator on the ICU!

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The Münster strategy to avoid spinal cord ischemia during F/BEVAR

Solution 4: Standardized perioperative managment

For 48h:
Middle RR > 80mmHg, HB > 10 g/dl monitored on ICU
Bedrest.

Circulatory stability :
Avoid blood loss or substitute.
Ideal volume therapy.
Avoid catecholamines if possible.

Cerebrospinal fluid drainage (CSFD) only on demand.

The Münster strategy to avoid spinal cord ischemia during F/BEVAR

Propensity score analysis **2010-2014** vs **2015-2022**

Table II. Patient demographics and characteristics before and after Propensity Score matching

Variables	Control group (n=105)	Intervention group before matching (n=242)	Intervention group after matching (n=105)
Age, years	70 ± 7	71 ± 8	70 ± 8
Male	75 (71)	159 (66)	73 (70)
ASA class 2	0 (0)	3 (1)	0 (0)
ASA class 3	20 (19)	42 (17)	16 (15)
ASA class 4	85 (81)	197 (81)	89 (85)
Tobacco Use			
no	38 (36)	108 (45)	39 (37)
current	37 (35)	96 (40)	38 (36)
former	30 (29)	38 (16)	28 (27)
COPD	27 (26)	56 (23)	28 (27)
Diabetes	11 (10)	34 (14)	9 (9)
Hypertension	97 (92)	230 (95)	96 (91)
Hyperlipemia	56 (53)	111 (46)	57 (54)
Coronary artery disease	36 (34)	86 (36)	39 (37)
Stenosis supra-aortic vessels	27 (26)	29 (12)	21 (20)
unknown	13 (12)	77 (32)	13 (12)
Peripheral atherosclerosis	36 (34)	74 (31)	35 (33)
Patent hypogastric artery (50%) - right	102 (97)	233 (95)	104 (99)
Stenosis/occluded hypogastric artery (50%) - right	3 (3)	7 (3)	1 (1)
Aneurysm hypogastric artery (50%) - right	0 (0)	2 (1)	0 (0)
Patent hypogastric artery (50%) - left	102 (97)	231 (95)	103 (98)
Stenosis/occluded hypogastric artery (50%) - left	2 (2)	9 (4)	2 (2)
Aneurysm hypogastric artery (50%) - left	1 (1)	2 (1)	0 (0)

Table II. Patient demographics and characteristics before and after Propensity Score matching

GFR	72 ± 26	70 ± 25	72 ± 25
Type of thoracoabdominal aortic aneurysm			
TAAA II	48 (46)	105 (43)	50 (48)
TAAA III	50 (48)	99 (41)	48 (46)
TAAA IV	5 (5)	27 (11)	5 (5)
juxtarenal	2 (2)	7 (3)	2 (2)
PAU	0 (0)	4 (2)	0 (0)
Covered aorta length (categorised)			
Group 1: 0 - 50%	37 (35)	101 (42)	32 (30)
Group 2: >50 - 75%	24 (23)	32 (13)	24 (23)
Group 4: >75 - 100%	44 (42)	109 (45)	49 (47)
Largest diameter [mm]	63 [58; 70]	63 [58; 72]	63 [60; 72]
Symptomatic	16 (15)	64 (26)	14 (13)
Ruptured	1 (1)	17 (7)	0 (0)
missing values	7	12	7

Note. PS, Propensity score; ASA, American Society of Anesthesiologists; COPD, chronic obstructive pulmonary disease; GFR, glomerular filtration rate; PAU, penetrating atherosclerotic ulcer; TAAA, thoracoabdominal aortic aneurysm; Categorial variables are presented as absolute and relative frequencies (%). Continuous variables are reported as mean ± standard deviation or median [25% quantile; 75% quantile].

The Münster strategy to avoid spinal cord ischemia during F/BEVAR

Propensity score analysis **2010-2014** vs **2015-2022**

Table V. Spinal cord ischemia

Variables	Control group (n=105)	Intervention group (n=105)	P-value
Postoperative SCI	25 (23.8%) 3.8 (95% CI 1.8 – 8.0)	8 (7.6%) Reference	<0.001
Paraparesis*	18 (17.1%) 3.6 (95% CI 1.5 – 8.7)	6 (5.7%) Reference	0.004
Paraplegia*	7 (6.7%) 4.2 (95% CI 0.85 – 21.2)	2 (1.9%) Reference	0.078
Permanent paraplegia	4 (3.8%) 4.1 (95% CI 0.44 – 38.5)	1 (1%) Reference	0.215
Recovery at discharge			
no	6 (24%)	2 (25%)	
partial	17 (68%)	5 (62.5%)	
complete	2 (8%)	1 (12.5%)	

Note. SCI, Spinal cord ischemia; Data are presented as absolute and relative frequencies (%). Odds ratios, corresponding 95% confidence intervals, and p-values were computed using logistic regressions with cluster-robust standard errors with matched-pair membership as the cluster. * For the subcategories of SCI, the logistic regressions modelled the probability of paraparesis or paraplegia compared to no SCI.

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Conclusion:

Staging...

Early restauration of the iliac perfusion...

Communication Operator-Anesthesiology...

Standardized perioperative management without prophylactic CSFD...

....reduce the risk for SCI below 8% and for Paraplega below 2%

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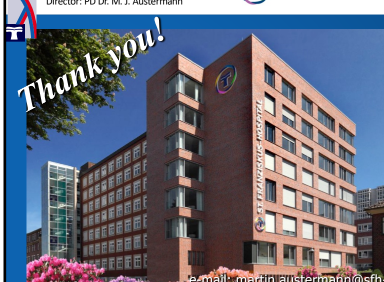

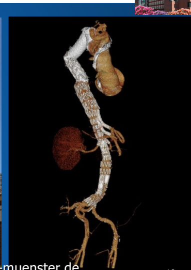

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