VEITH SYMPOSIUM
Connecting The Vascular Community

Shifts In Prevention Protocols For SCI During Open And Endovascular TAAA repair

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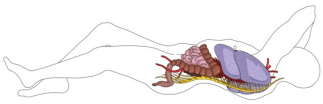
Disclosures

- PI/Co-PI for several thoracic and abdominal aortic stent graft trials (Cook, Inc, Cordis® Corporation, Bolton Medical)
- Proctor and lecturer at symposia hosted by Cook, Inc., Bolton, W.L. Gore and Associates, Jotec and Medtronic, Inc.
- None relevant

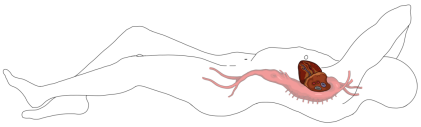
SCI may be a consequence of «anything» going wrong during TAA repair

Multisystem organ protection

1. Heart
2. Kidneys
3. Spinal Cord
4. Lungs
5. Systemic



1. Heart



Preoperative cardiac evaluation

Coro- CTA

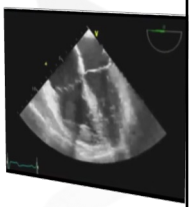
- Coronary stenosis in 22% of pts*
- Preop. PTCA / CABG: 11% of pts*

* TAAA pts between 2012 and 2017

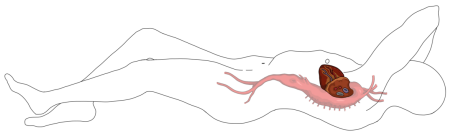
Intraoperative cardiac monitoring

Continuous TEE

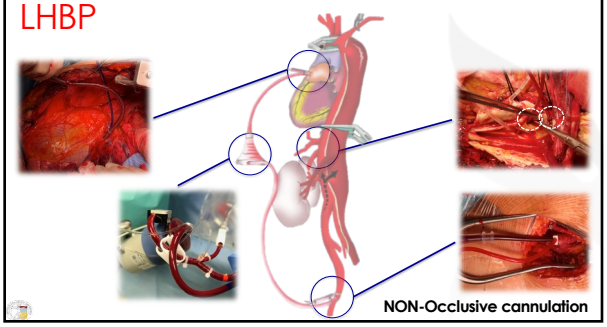
- Cardiac function evaluation
- Immediate response to changes



2. Left Heart ByPass



LHBP



LHBP

Use of Left Heart Bypass in the Surgical Repair of Thoracoabdominal Aortic Aneurysms

Marc A.A.M. Schepens, MD, Jo J.A.M. Defauw, MD, Ruben P.H.M. Hamerlijnck, MD, and Paddy B.E. Vermeulen, MD, Nieuwegein, The Netherlands

- Reduces cardiac afterload
- Spinal cord protection
- Visceral protection
- Low heparinization required

Schepens MA, et al. Ann Vasc Surg 1995

LHBP our indications

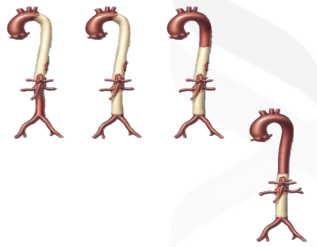
@ San Raffaele Hospital

Always

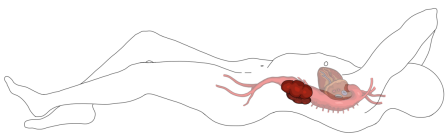
- Extent I - II - III

Selectively

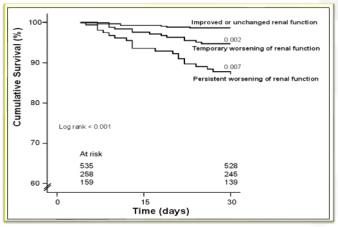
- Extent IV



3. Kidneys



Worsening of renal function … predicts mortality



Welten et al, Am J Kidney Dis 2007

… and Spinal Cord ischemia

Ultrafiltration / Hemodialysis

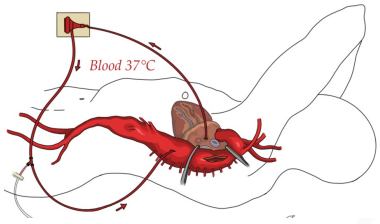
- Intermitting
- Continuous

Macedo E et al , Am J of Kid Dis 2016

Haemodynamic Instability

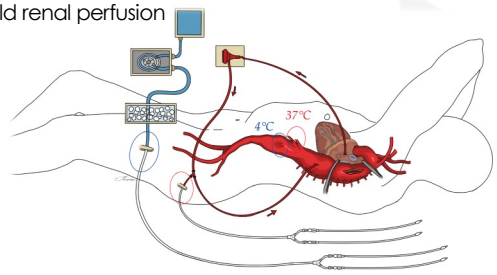
Kidney protection?

Left Heart ByPass



Kidney protection?

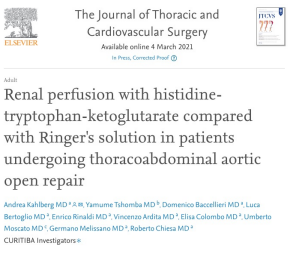
Cold renal perfusion



Custodiol solution

Factor	mmol/l	Main action
Na Cl	15.0	Intracellular concentration
K Cl	9.0	
Mg Cl	4.0	
Histidine	18.0	scavenger / buffer
Tryptophan	2.0	↑membrane integrity
a-Ketoglutarate	1.0	
Mannitol	30.0	Osmotic agent
Osmolality	**310 mOsm/l**	
pH (at 5° C)	**7.4 – 7.45**	

Custodiol vs Ringer PRT



The Journal of Thoracic and Cardiovascular Surgery

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In Press, Corrected Proof

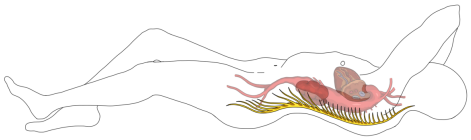
Adult

Renal perfusion with histidine-tryptophan-ketoglutarate compared with Ringer's solution in patients undergoing thoracoabdominal aortic open repair

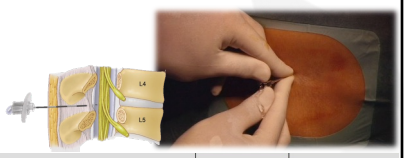
Andrea Kahlberg MD [a] [A], Yamume Tshomba MD [b], Domenico Baccellieri MD [a], Luca Bertoglio MD [a], Enrico Rinaldi MD [a], Vincenzo Ardita MD [a], Elisa Colombo MD [a], Umberto Moscato MD [a], Germano Melissano MD [a], Roberto Chiesa MD [a]

CURITIBA Investigators [*]

4. Spinal Cord



Cerebro Spinal Fluid Drainage (CSFD)

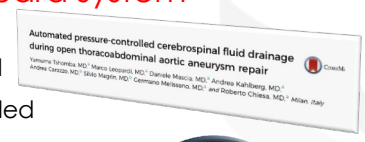


Recommendation 50		
In patients with extensive thoraco-abdominal aortic aneurysm (type I, II, III) undergoing open repair, cerebrospinal fluid drainage should be considered as a measure to decrease the risk of neurological deficit	IIa	B

Riambau V., et al. ESVS Guidelines 2017

CSFD Liquoguard system®

- Automated and pressure-controlled drainage
- ⬇Complications of over drainage



Tshomba Y., et al. JVS 2017

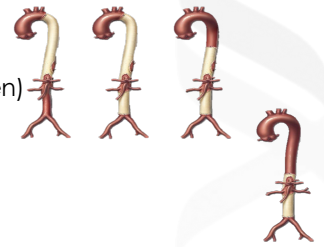
CSFD: our indications

Always

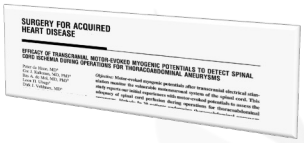
- Extent I - II – III (Open)

Selectively

- Extent IV (Open)
- Endo



Neuromonitoring

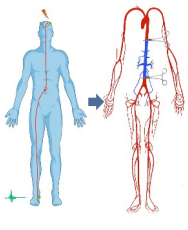


Motor & Somato Sensory Evoked Potentials (MEP&SSEP)

- Continuous monitoring of SC function
- Early SCI detection for adjunctive maneuvers

De Haan P, et al. J Thorac Cardiovasc Surg 1997

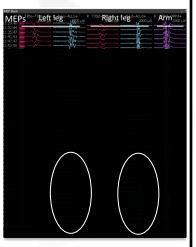
MEP & SSEP



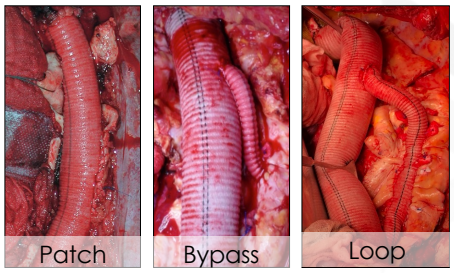
1. Increase proximal and distal pressure

2. Early hypogastric reperfusion

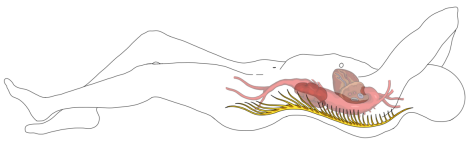
3. Intercostal a. reattachment



I.A. reattachment: when, how?



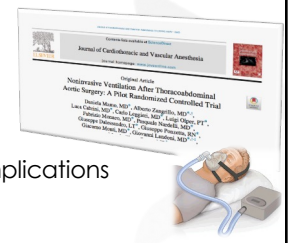
5. Lungs



Non-Invasive Ventilation (NIV)

Early prophylactic NIV:

- postop. respiratory complications
- mortality



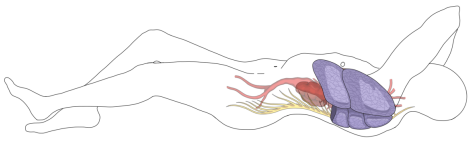
Mamo D.,et al. . J Cardiothorac Vasc Anesth 2019

Intercostal nerves cryoblation

- Improved pain control
- Less opioid usage
- Possible respiratory improvement
- No haemodynamic effect

Tanaka A, et al. Ann Thorac Surg 2020

6. Systemic



ROTEM-driven transfusion strategy

ROTEM

- Rapid diagnosis (10 min.)
- Crucial info on fibrinogen and fibrinolysis

Monaco F, et al. EJVES 2019

ROTEM-driven transfusion strategy

Significant decrease in:

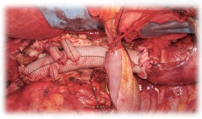
- Transfusions
- Postoperative pulmonary complications
- Costs

Monaco F, et al. EJVES 2019

Comparison of different time periods (1107 patients)

Group 1 (1989 – 2009) 455 pts
Selective use of adjuncts

Group 2 (2010 – 2022) 652 pts
Systematic use of adjuncts



Chiesa R, et al. J Clin Med 2023

Comparison of different time periods (1107 patients)

Significantly lower 30-day mortality and permanent SCI with systematic use of adjuncts (Group 2)

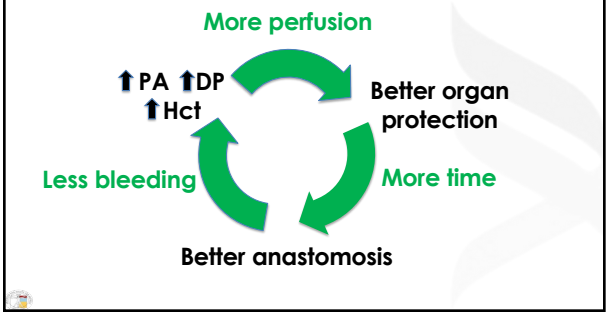

Outcomes following Management of Complex Thoracoabdominal Aneurysm by an Open Approach

	N	30-days Mortality	Permanent SCI	Renal Failure	Respiratory Failure
Group 1	455	61 (13.4 %)	54 (11.9 %)	33 (7.2 %)	145 (31.9 %)
Group 2	652	53 (8.1 %)	51 (7.8 %)	31 (4.7 %)	177 (27.1 %)
p.		.004	.023	.079	.088

Chiesa R, et al. J Clin Med 2023

Conclusions

The virtuous circle of TAAA surgery

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