How to Prevent Patch Aneurysms After Open TAAA Repair With Long Antegrade Grafts:

How to Treat Them When They Occur – Endo, Open

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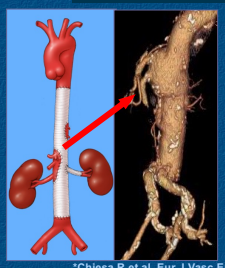
Disclosure

I have no relevant financial relationships to disclose

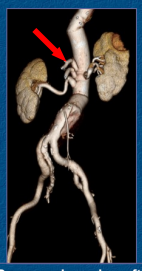
Background



- Historically, intercostal, visceral and renal arteries were re-implanted as patches
- Risk of visceral patch aneurysms 8-12%, and mortality risk from them 40%*
- Highest risk in genetically-triggered aortic diseases

*Chiesa R et al. Eur J Vasc Endovasc Surg. 2005; 29(4):383-9
Cambria RP et al. aneurysm repair. J Vasc Surg. 2003; 37(2):254-61.

Preventing Patch Aneurysms

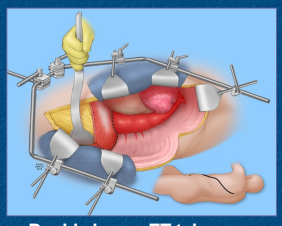


- Avoiding the patch
- Eliminating all aortic tissue in visceral reconstruction
- Individual visceral/ renal grafts with distal anastomosis to button at origin of artery or directly to it

Pre-sewn branch grafts

Long antegrade bypasses

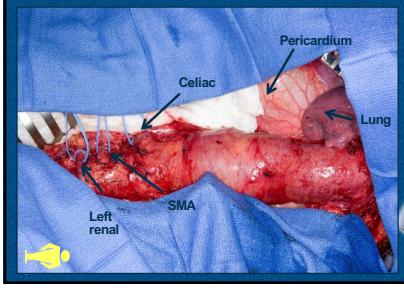
Set up and Exposure for TAAA Repair



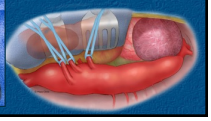
- Right semi-lateral decubitus position
- Single space thoracotomy
- Costal cartilage divided
- Diaphragm divided circumferentially

- Double lumen ET tube
- +/- CSF drain

Technique

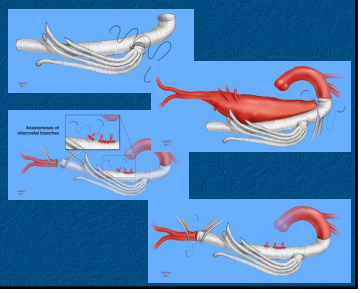


- L Kidney taken up
- Crus divided
- Supraceliac and infrarenal aorta dissected free
- Visceral and renal arteries isolated

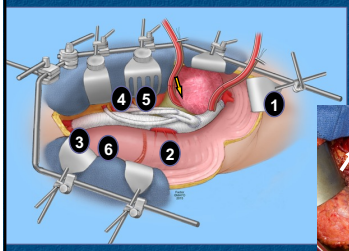


Technique (DHCA)

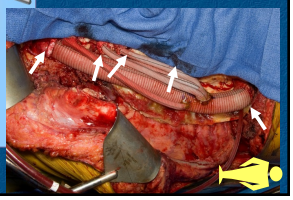
- Cannulate aortic arch (TEE), RA and place LV vent
- Cool to EEG burst suppression (~22° C)
- Branch grafts sewn to woven aortic graft during cooling
- Proximal anastomosis with retrograde cerebral perfusion
- Cannulation of graft for antegrade perfusion
- Intercostal patch
- Distal anastomosis while cold



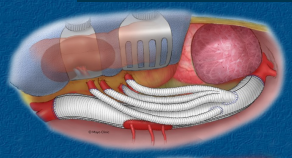
Steps in Branch Reconstruction under CPB



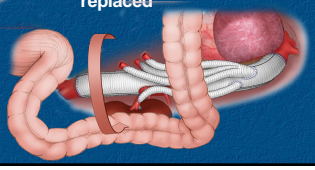
- RRA, SMA, LRA, and CA in that order during re-warming



Branch Graft Configuration

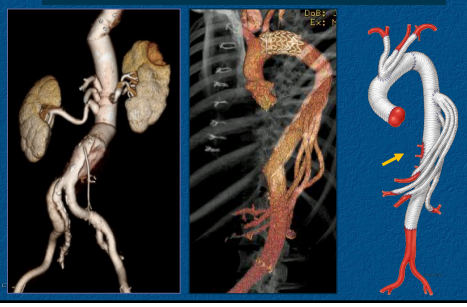


- Retractors removed
- Peritoneal contents and L Colon replaced



- Long Antegrade grafts rotate on axis of each graft
- Prevents branch graft kinking

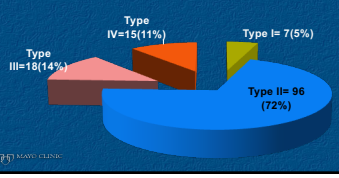
Branch Graft Configuration



Patients with TAAA

133 patients

Technique transitioned to CPB with DHCA



Mean Age: 57 years
Median SVS/AAVS Score: 5

Patient Demographics

Variable	Number (%)
Mean TAAA Diameter (cm)	6.34
Dissection	78 (58)
Connective Tissue Disease	39 (30)
CAD	53 (40)
COPD	33 (25)
Renal insufficiency (S. Cr > 1.5 mg/dL)	5(4)
Previous aortic repair	86 (65)

Operative Details

Variable	Median/Number	Mean
Core temperature	18° C	18° C
Circ arrest time	23 mins	31 mins
CPB time	255 mins	248 mins
Pairs of intercostal arteries	3	2.6
Blood Loss	2904 ml	4048 ml
RBC Tx	1985 ml	2790 ml
FFP Tx	1751 ml	2213 ml
Platelet Tx	610 ml	824 ml

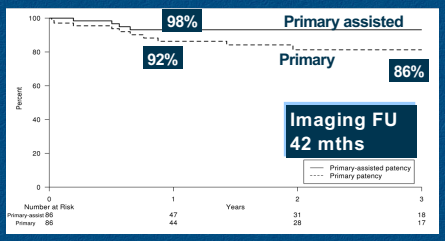
Early Operative Complications

Morbidity/Mortality	With DHCA	Without DHCA
Paraplegia	3%	13%
Stroke	5%	9%
Myocardial infarction	1%	15%
Renal failure/hemodialysis	11%	39%
Permanent dialysis	0	2%
Overall mortality (<30d)	10 (10%)	4 (14%)

Graft related outcomes
(42-month imaging follow up)

Primary-assisted patency	N (%)
Overall VRB grafts (N= 473)	455 (96%)
Celiac artery (N=133)	130 (98%)
SMA (N=133)	130 (98%)
Renal arteries (N=202)	191 (95%)
Accessory renal arteries (N=5)	4 (80%)
Intercostal patches aneurysmal degeneration (N=574)	7

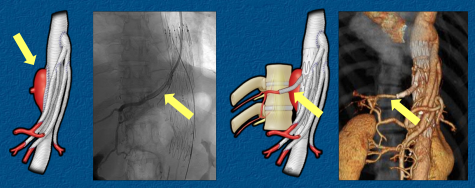
Branch Patency



TEVAR : Intercostal Patch Aneurysm

71 yr old female with Marfan's 6 yrs s/p open TAA

PMEG : Intercostal Patch Aneurysm



- Intercostal patch aneurysm in 28 year old with Loeys-Dietz
- Degeneration to 6.3 cm with 5 mm intercostal
- Treated with physician modified TX2 with single branch
- Branch patent at 6 year CT

Courtesy of Dr. Gustavo Oderich

Hybrid Repair of Visceral Patch Aneurysm

75 yr old female 15 yrs s/p open TAAA repair

Summary

- Open reconstruction is preferred for young patients and those with genetically-triggered aortic disease.
- Patch aneurysms can be avoided by TAAA repair with visceral / renal bypasses
- Durability of long antegrade bypasses is excellent