

HOUSTON AORTA 2026

SUTURELESS GRAFTS TO FACILITATE ARCH REPAIR: NOVEL TECHNOLOGIES AND OPPORTUNITIES

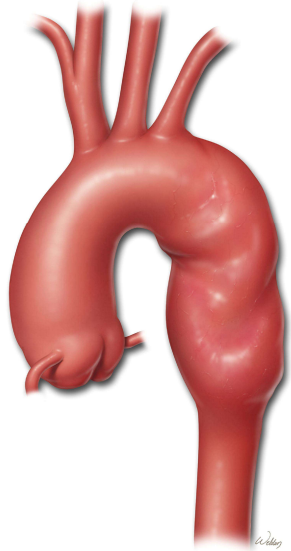
Nimesh D. Desai MD PhD

Joseph Bavaria MD – William Maul Measey Professor of Surgery
University of Pennsylvania
Director, Penn Aorta Center

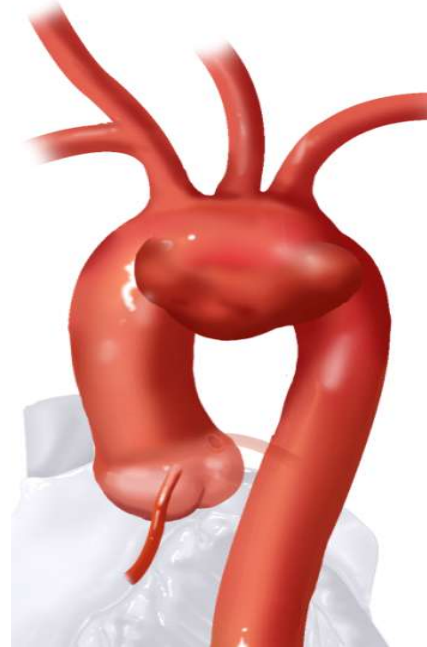
 @NimeshDesaiMD



WHO IS ELIGIBLE FOR COMPLEX THERAPIES IN THE AORTIC ARCH?



Distal Arch Aneurysm



Saccular Arch Aneurysm



Mega aorta – intact ascending LZ

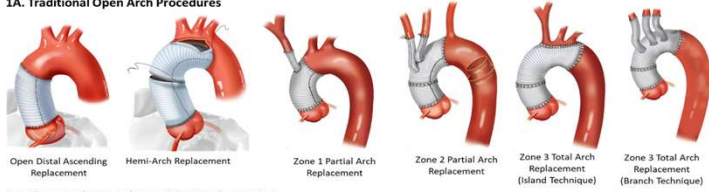


Residual Dissection or de novo Type A repair >80% of cases

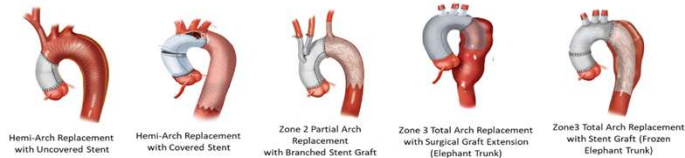
Aortic Arch Strategies

1. Open Arch Procedures

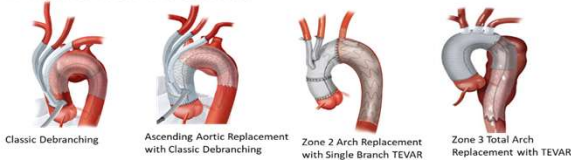
1A. Traditional Open Arch Procedures



1B. Open Arch Procedures with Distal Extension

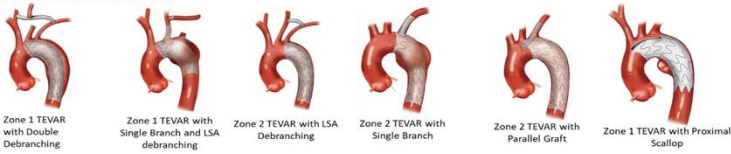


2. Hybrid Arch Procedures

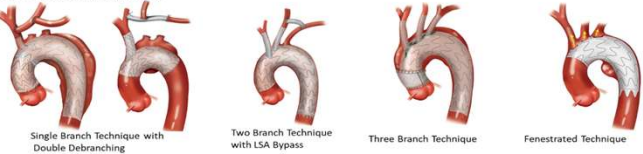


3. Endovascular Arch Procedures

3A. Partial Endovascular Arch



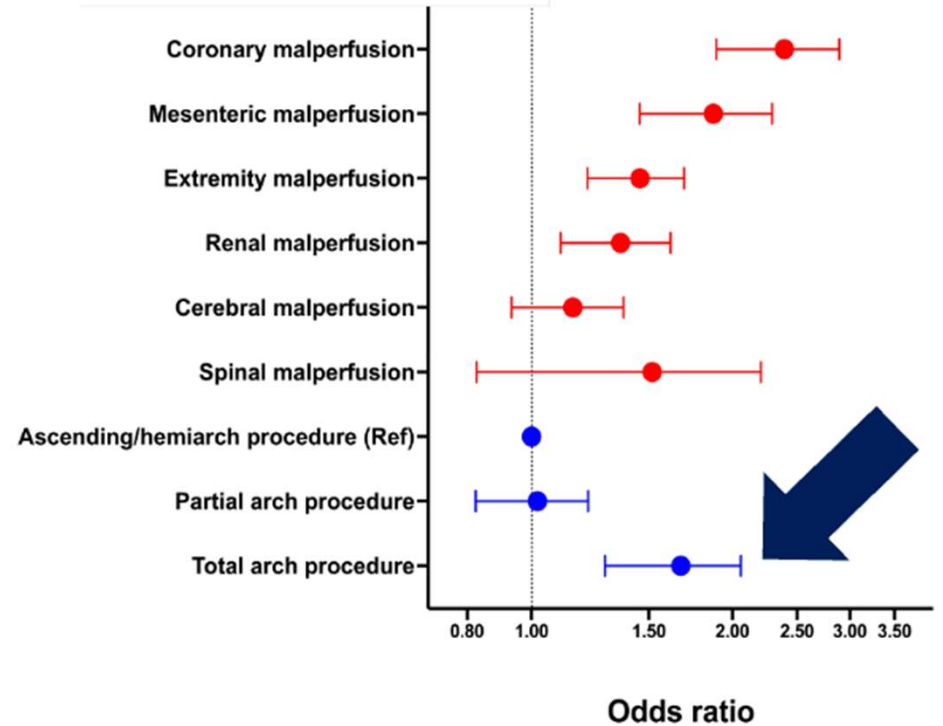
3B. Total Endovascular Arch



Malperfusion in Patients with Acute Type A Aortic Dissection: A Nationwide Analysis of the STS ACSD Database

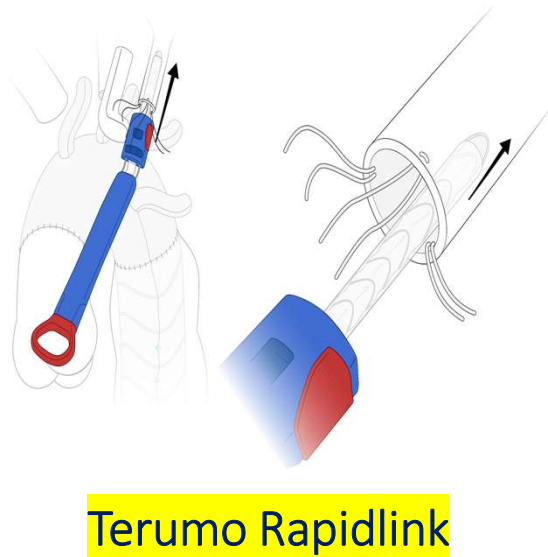
Nachreiner J, Coad MD, John J, Kelly MD, William L, Patrick MD, Yu Zhao MS, Joseph E, Bevilacqua MD, Nihal Oussorina MD PhD, Anthony L, Ezzamel MD, Hiroki Takayama MD PhD, Edward P, Chen MD, T, Brett Pevoto MD, O, Chad Hughes MD, Erik E, Rozell MD, Karen M, Kim MD, H, Haruhiko J, Patel MD, Michael E, Sweeney MD MS, Jason B, Sauer MD, Bradley G, Leifkowitz MD, Ouyang M, Swartz MD, William T, Brinkman MD, and [Thomas D, Grant MD PhD](#)

Mortality

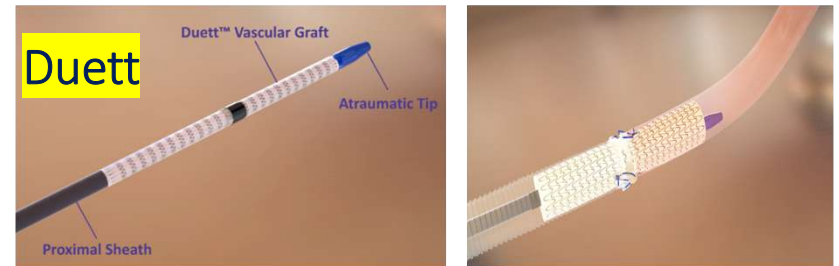


SUTURELESS GRAFT DESIGN CONCEPTS

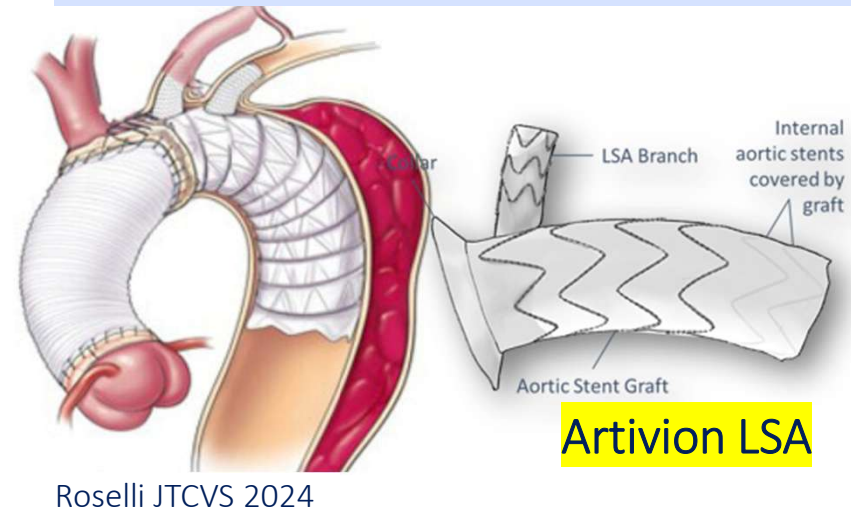
Graft with Sutureless Anastomosis to the Branch and hand sewn to the Aortic Graft



Graft with Sutureless Anastomosis to the Branch AND Aortic Graft

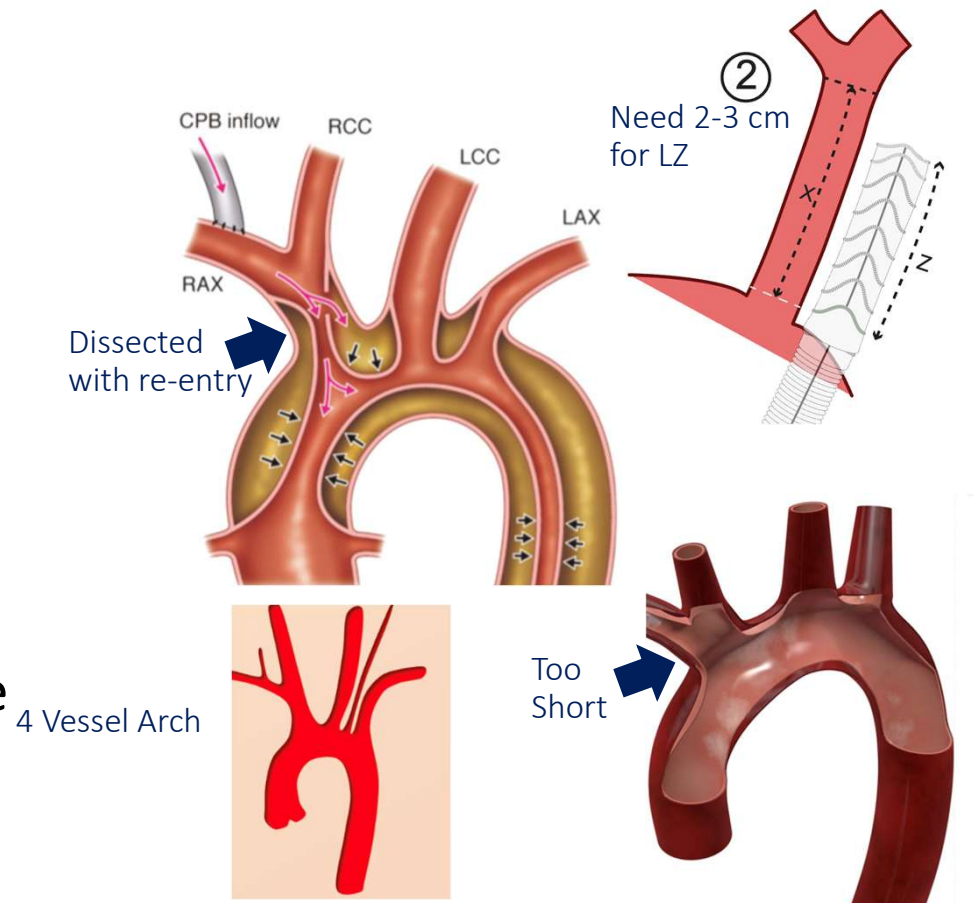


FET Graft with Integrated Branched with Sutureless Anastomosis



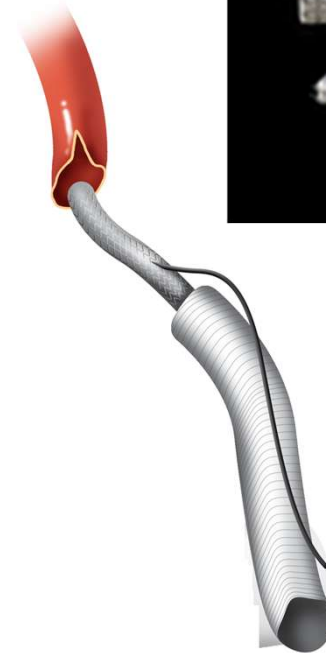
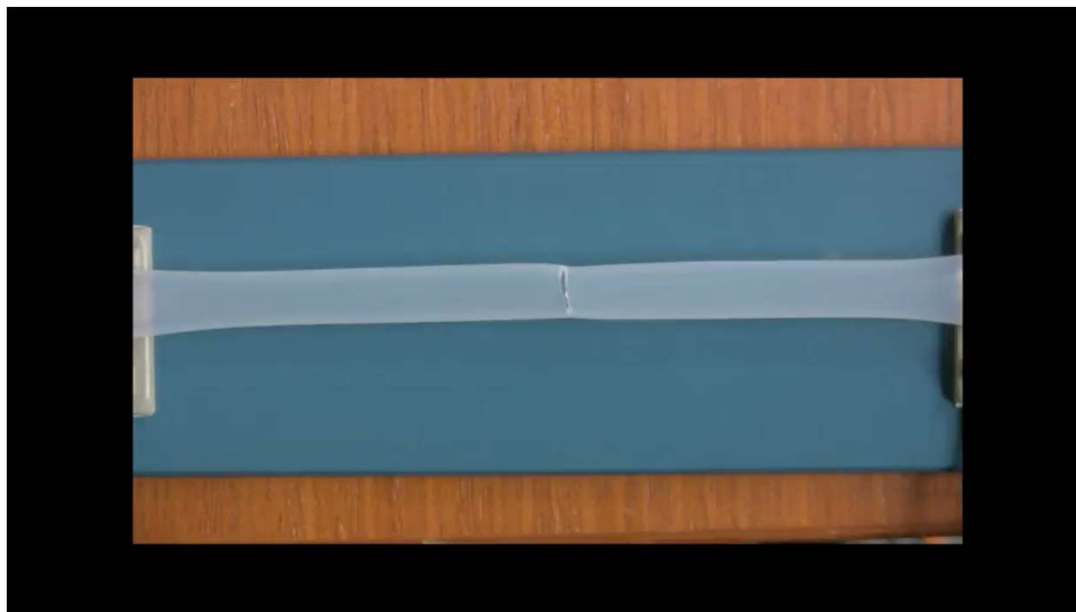
ANATOMIC CONSIDERATIONS:

- Ideal for Left Carotid – Usually 6-10mm – no Branches!
- LSA more variable diameters and variable L Vert Takeoff
- 4 vessel arches with small L verts
- **Innominate artery** dissections, bovine trunk, large size, early bifurcations – more like a sutureless aorta (>2cm)



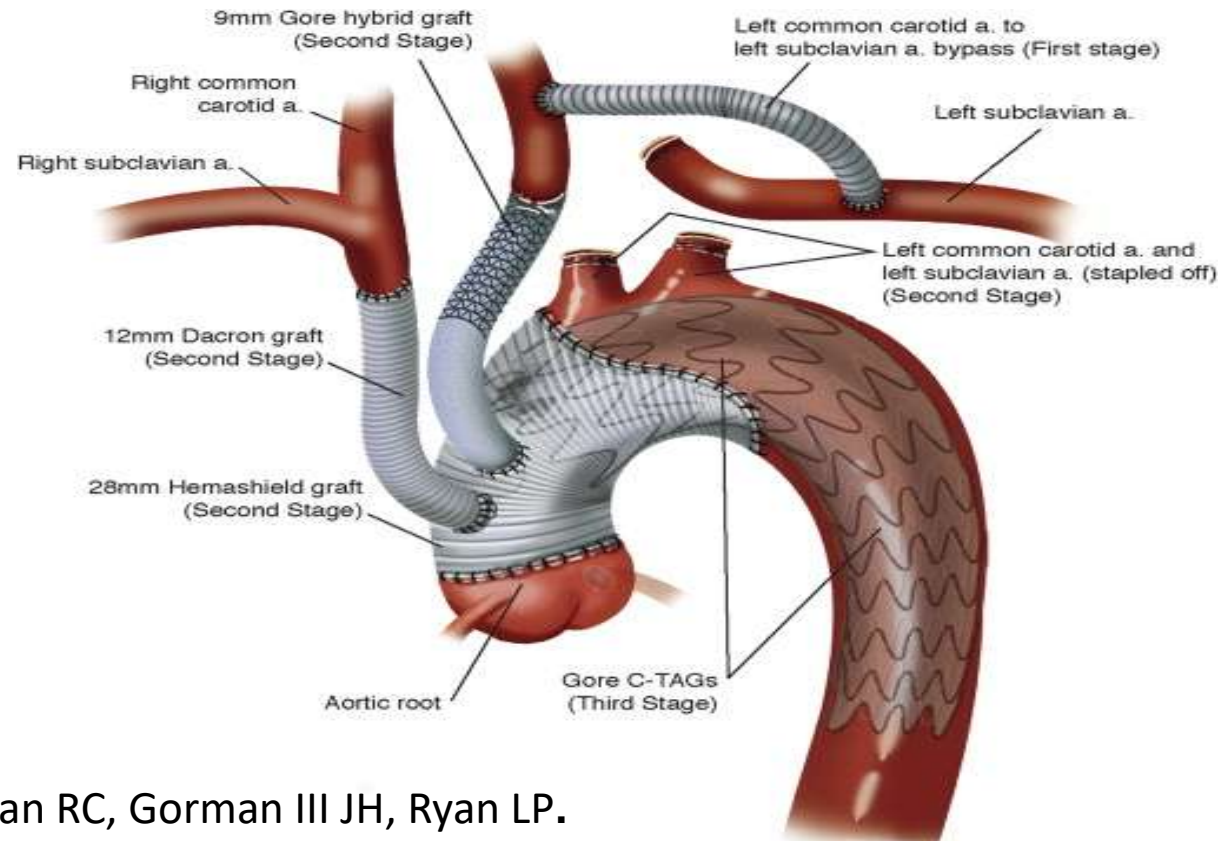
GORE HYBRID DEVICE

- Goretex Graft
- Crimped Viabahn 5cm stent 6-9mm diameters
- Indicated for Dialysis fistula –not currently on market



Rapid Aortic Arch Debranching Using the Gore Hybrid branches

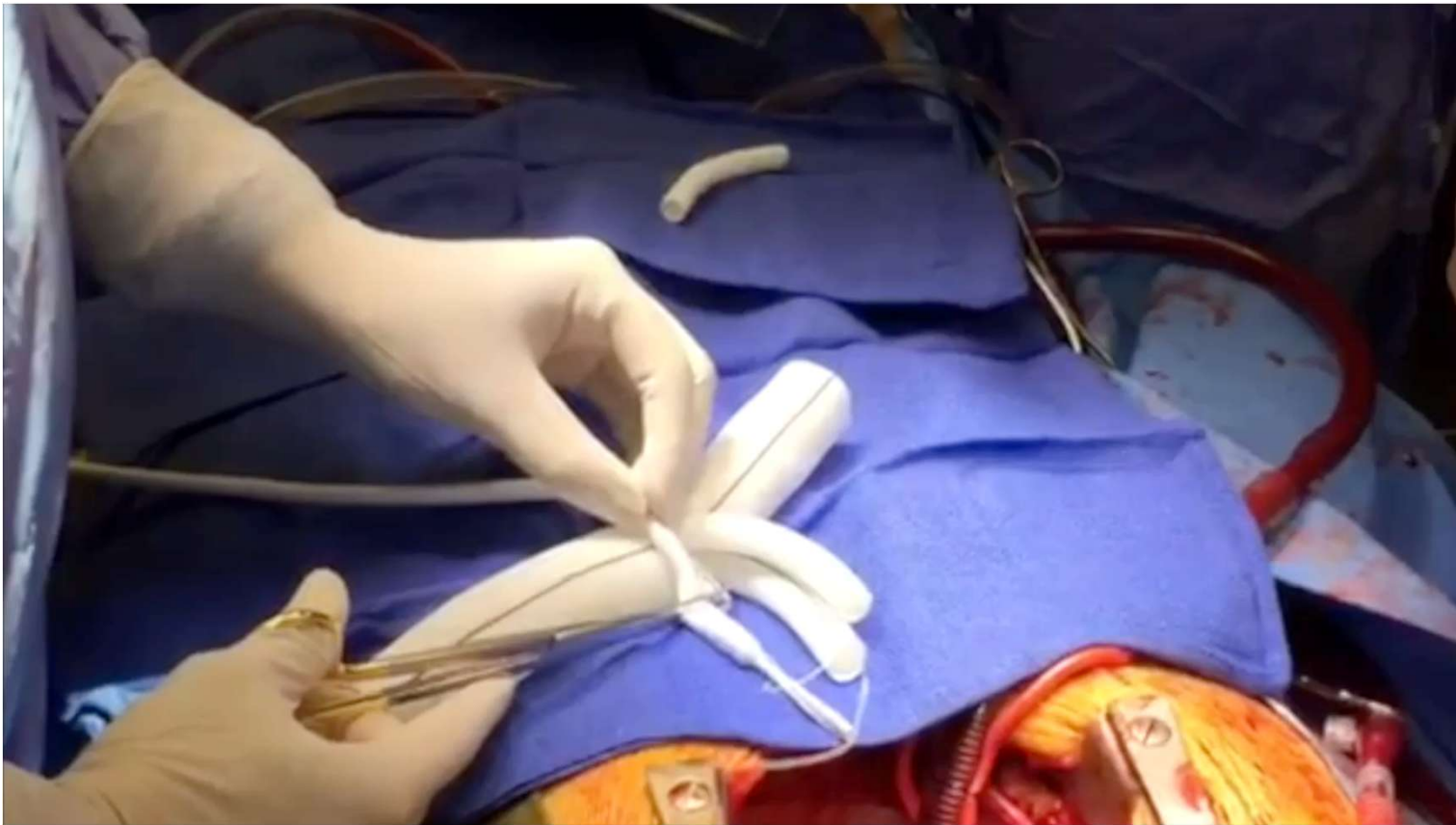
2012!!!



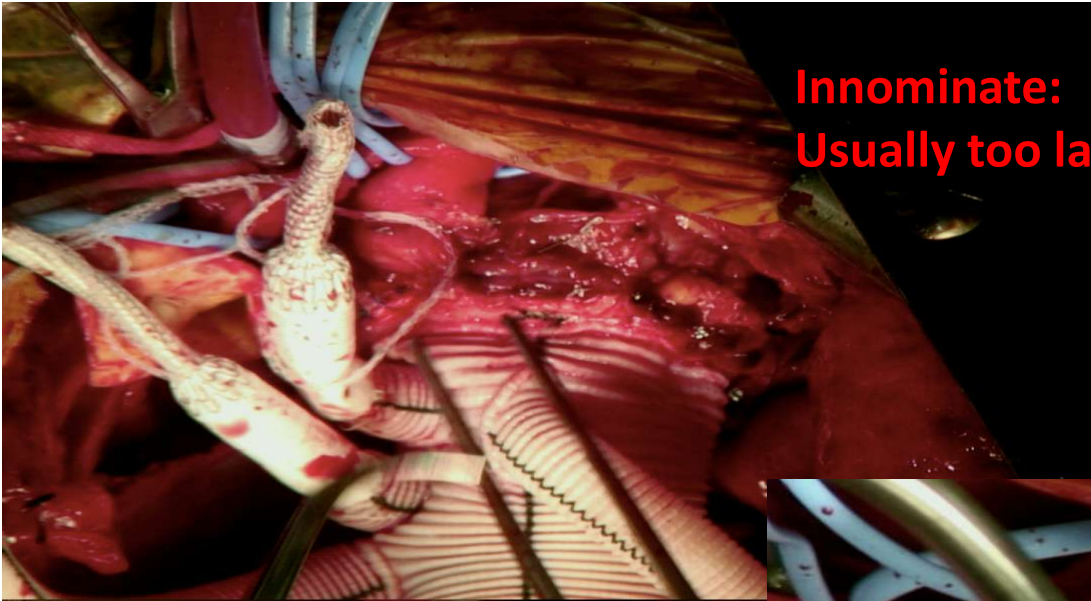
Levack MM, Bavaria JB, Gorman RC, Gorman III JH, Ryan LP.

The Annals of Thoracic Surgery Volume 95, Issue 6 2013 e163 - e165.

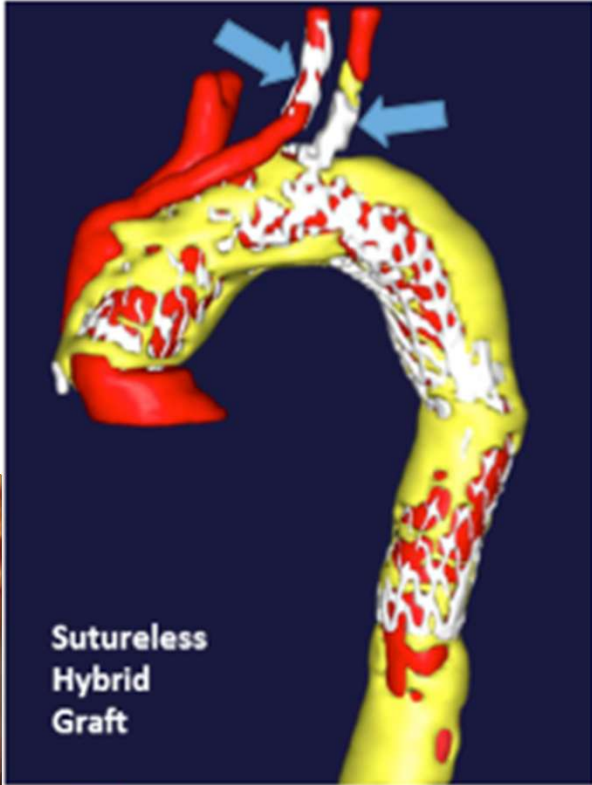
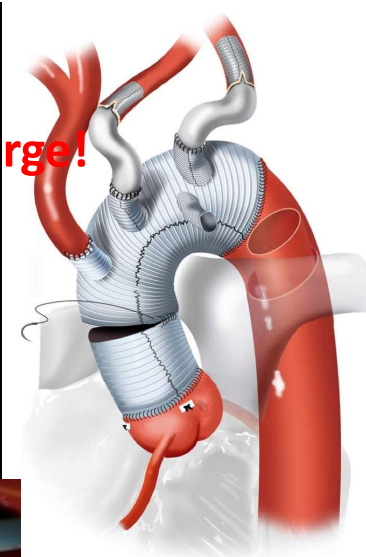
ZONE 2 ARCH FOR ACUTE TYPE A DISSECTION WITH HYBRID GRAFT FOR LEFT CAROTID ARTERY



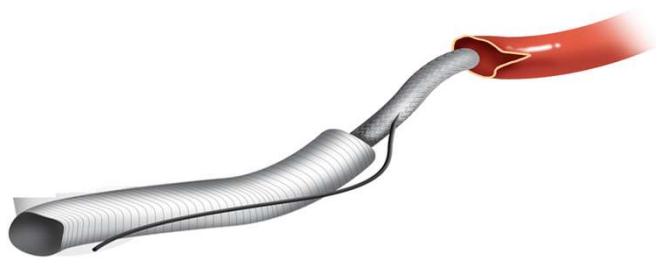
DOUBLE HYBRID GRAFT LCC, LSCA



Innominate:
Usually too large!



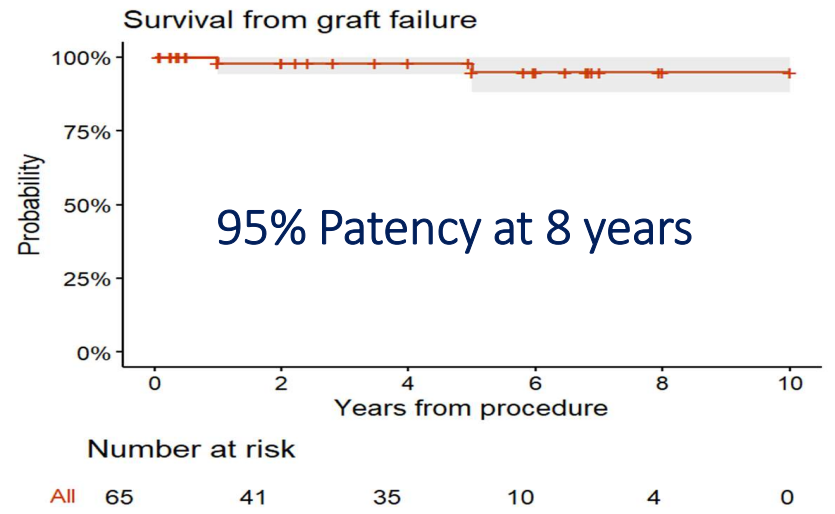
PENN GORE HYBRID EXPERIENCE: 74 GRAFTS IN 65 PATIENTS



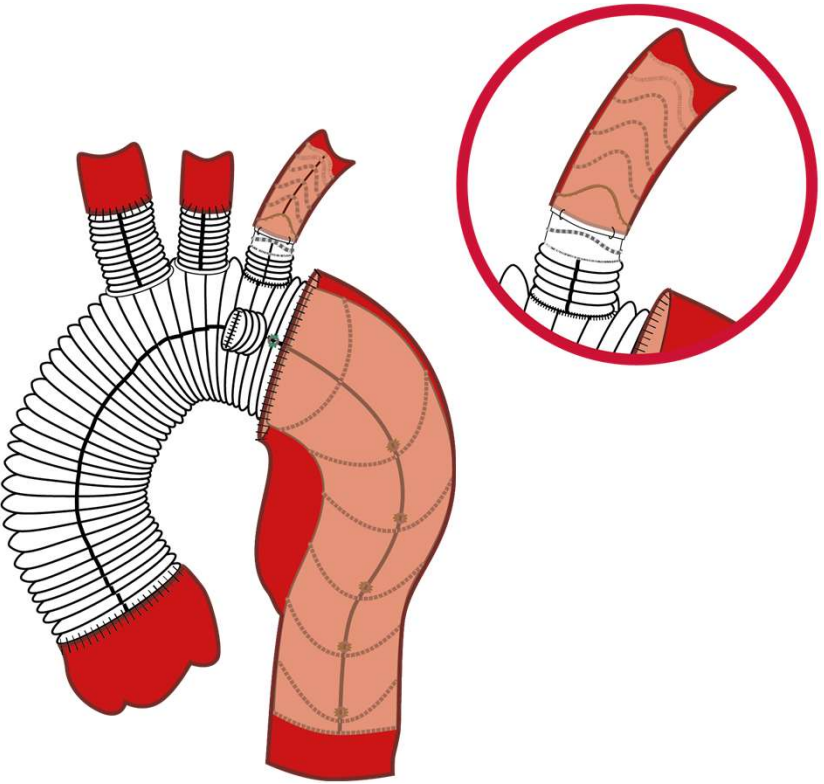
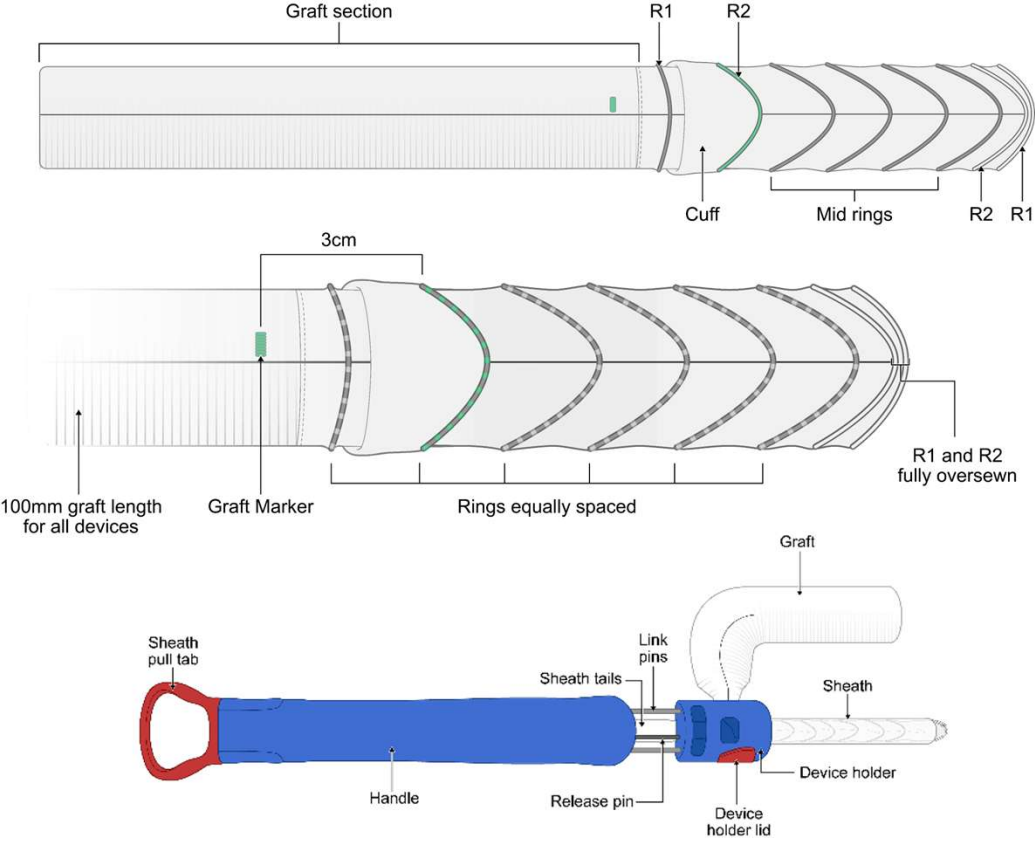
| Baseline Characteristics | N=65 % (N) |
|--------------------------------|---------------|
| Age, years | 62.5 ± 11.0 |
| Surgery Indication | |
| Aortic arch aneurysm | 27% |
| Acute Type A aortic dissection | 50% |
| Residual Arch dissection | 20% |
| Ruptured aorta | 3% |

One Late Occlusion with TIA and 2 Asymptomatic Occlusions at 10 yrs

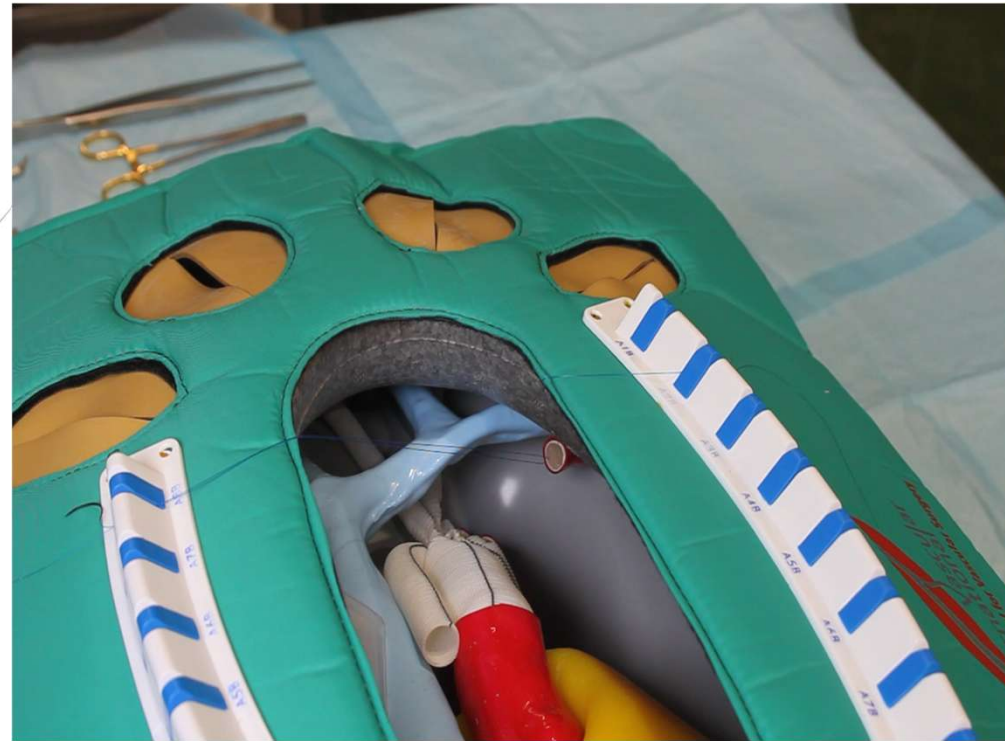
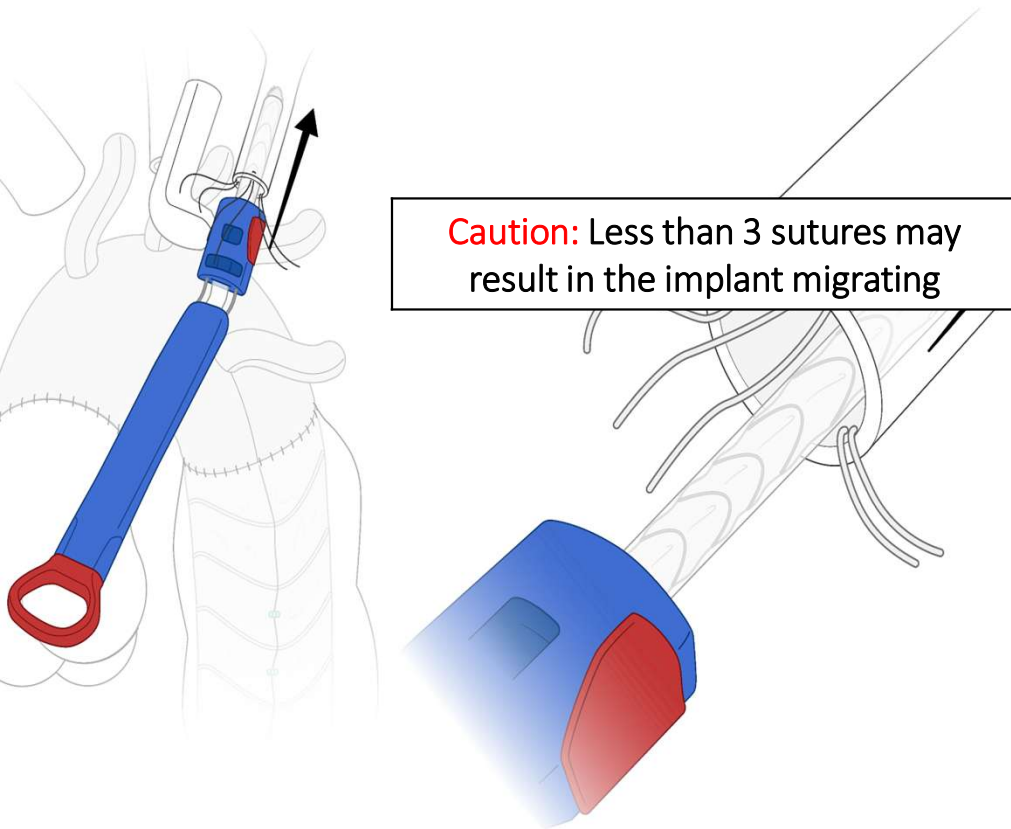
| N=74 | |
|---|--------------------|
| Technical success of graft deployment | 100% |
| Supra-aortic vessel debranched with Hybrid Graft | |
| Left Common Carotid artery (LCCA) | 83% |
| Left Subclavian artery (LSA) | 1.5% |
| LCC and LSA | 6% |
| LCC and RCC | 6% |
| RCC | 1.5% |
| LCC and L Vert | 1.5% |
| Total ACP time (min) | 30.3 ± 12.0 |



TERUMO RAPID LINK DEVICE

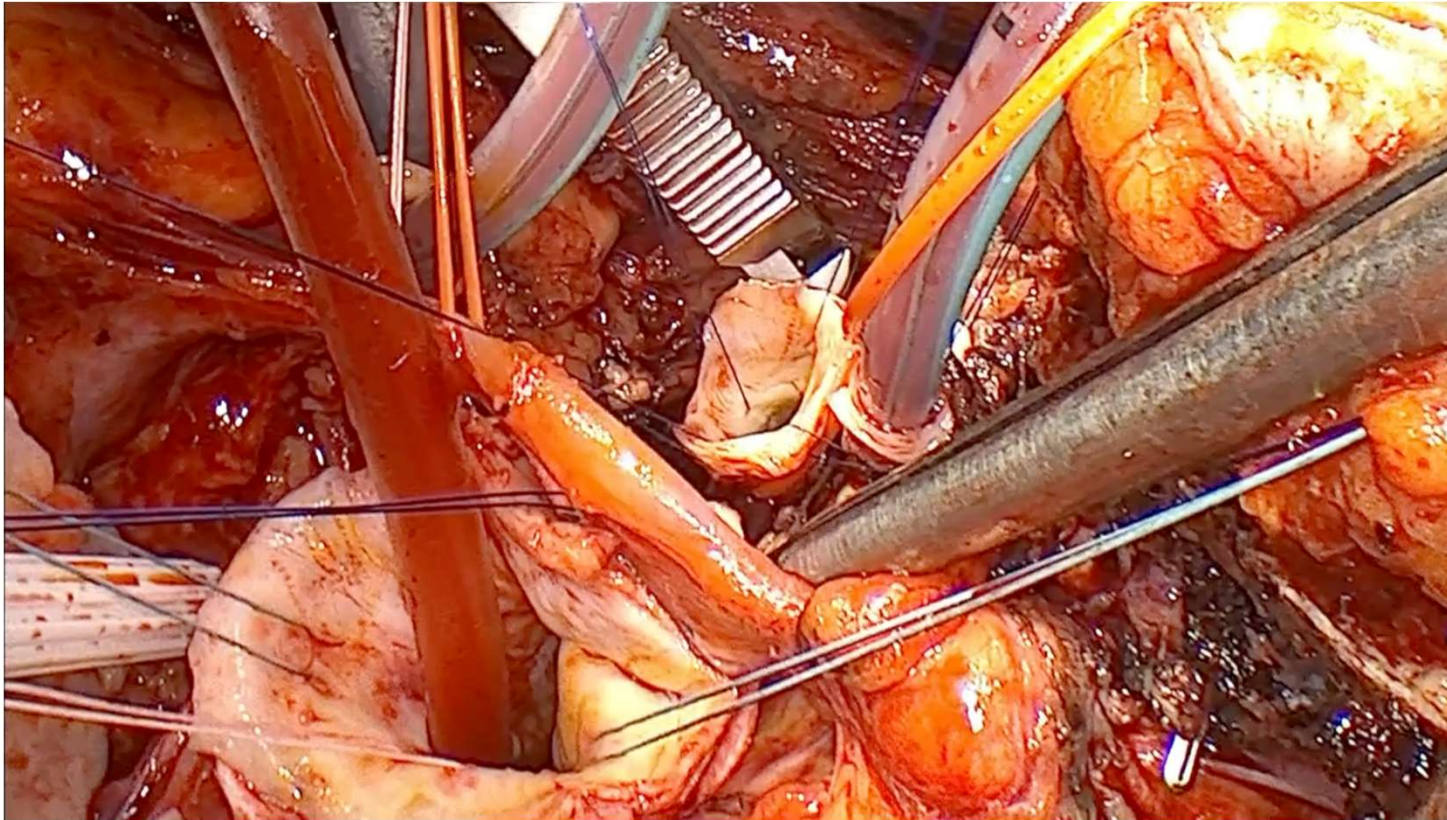


RAPID LINK Implant Procedure

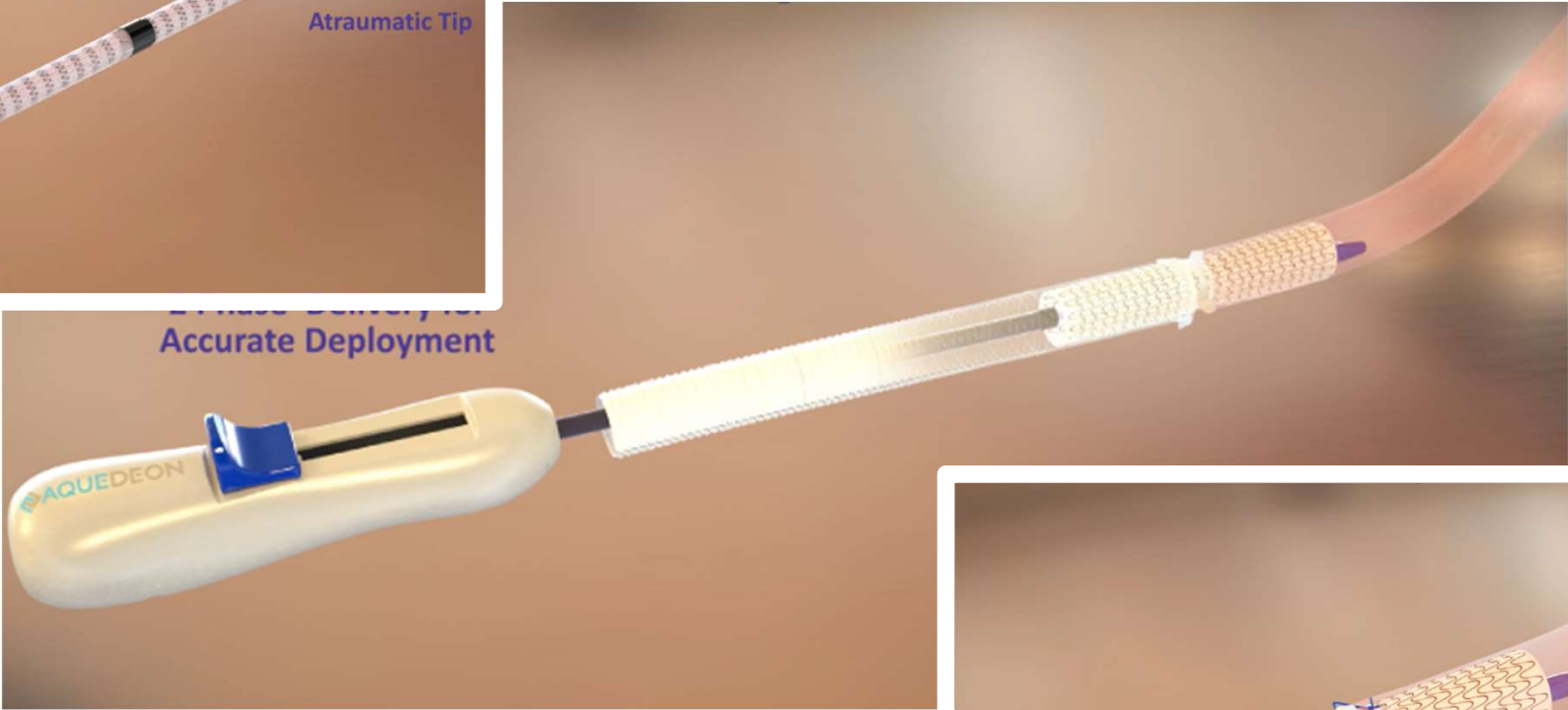
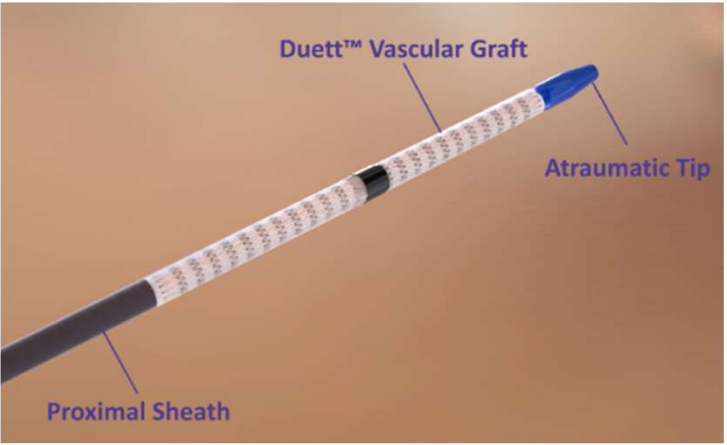


RAPID LINK First in Human Implant

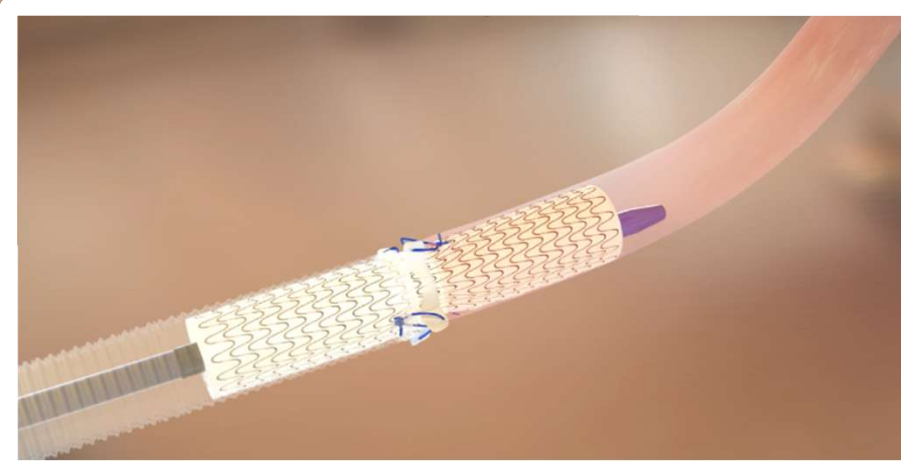
Dr. Malak Shrestha: Live Case EACTS 2025



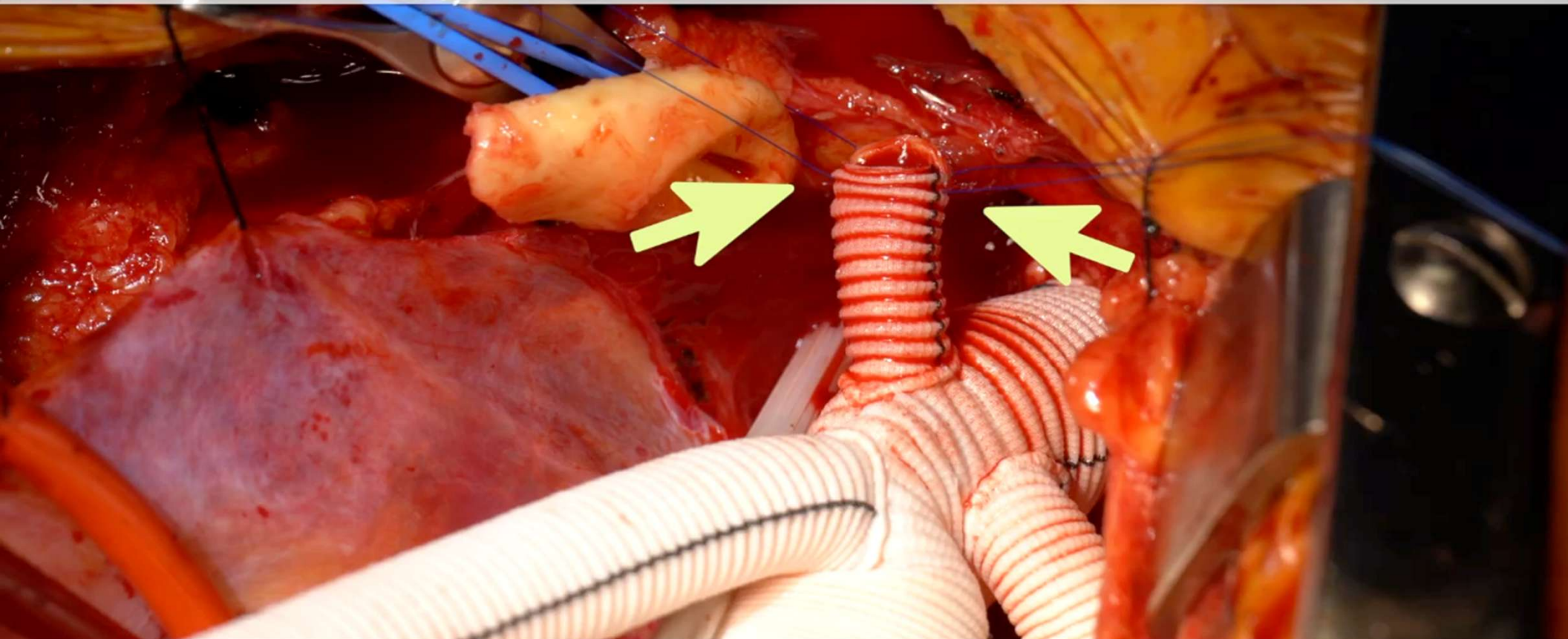
Duett Vascular Graft – Aquedon Medical



Final deployment →

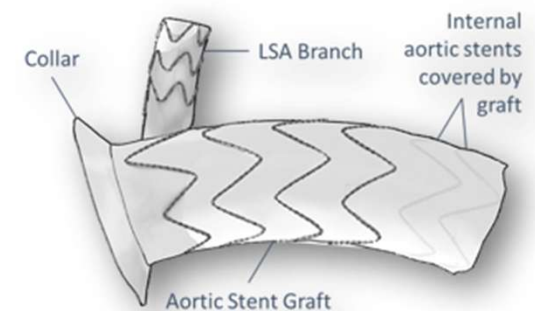
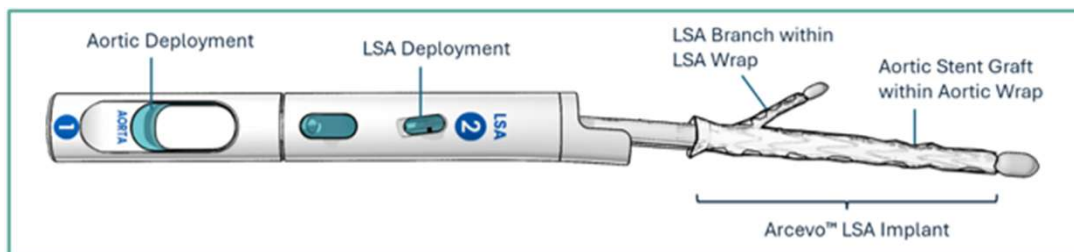
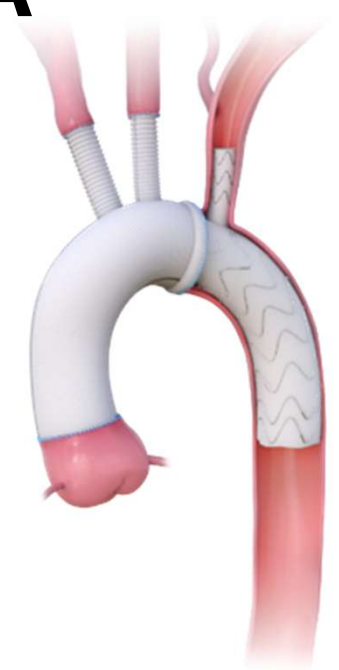


Two 4-0 polypropylene stay sutures are placed opposite each other at 9 and 3 o'clock through the artery and the graft.

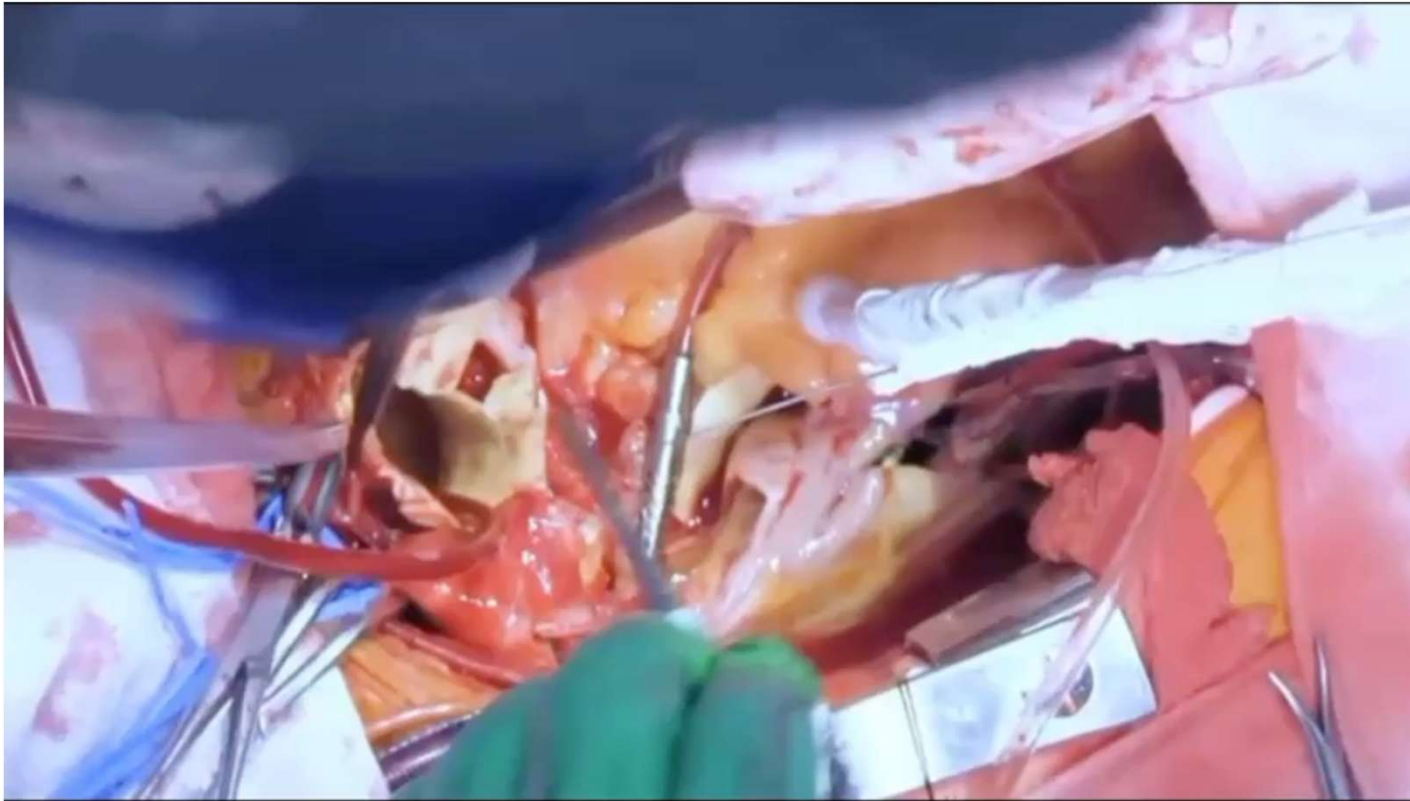


ARTIZEN Study: Artivion ARCEVO LSA

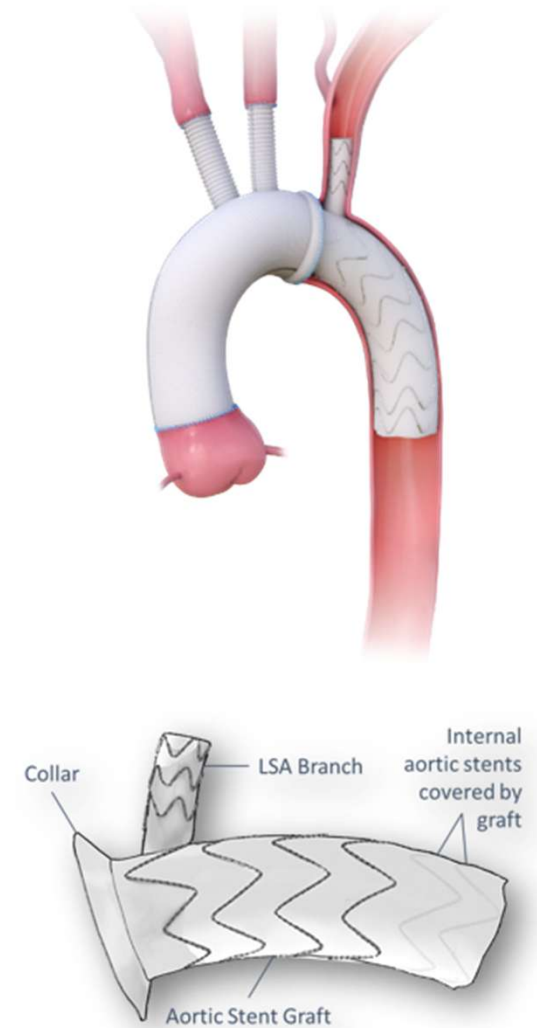
- The Arcevo LSA Hybrid Stent Graft System is an implantable aortic stent graft with LSA branch which is preloaded onto a delivery system and implanted during an open surgical procedure, or a total arch replacement (TAR) procedure.
- The device is intended for use with a proximal surgical graft (not supplied). If additional coverage is needed, a protocol specified thoracic endovascular aortic repair (TEVAR) device may be used.



ARTIZEN Study: Artivion ARCEVO LSA FIH Implant @ CCF



Courtesy Dr. Eric Roselli



THE FUTURE IS HERE!

*RAPID LINK, ARCEVO LSA, DUETT ALL
CURRENTLY ENROLLING IN IN THE US AND
GLOBALLY*

