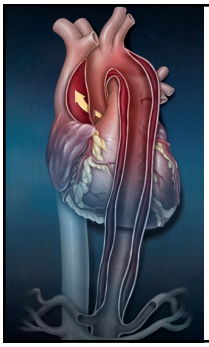
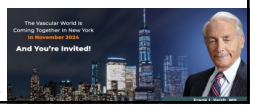


With TAAD When And How Should The Distal Aorta Be Treated By TEVAR Before Repair Of The Ascending Aorta

Ourania Preventza MD, MBA,FACS
Professor of Surgery, University of Virginia
Chief of Cardiothoracic Surgery University of Virginia
Co –Director of the Cardiovascular Service Line
University of Virginia Health

November 19-23 2024

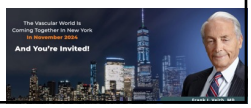
MORE ADVANCES RELATED TO TREATING PATHOLOGY INVOLVING THE ASCENDING AORTA AND THE AORTIC ARCH; AORTIC DISSECTIONS, INTRAMURAL HEMATOMES (IMHS) AND THEIR TREATMENT



Disclosures

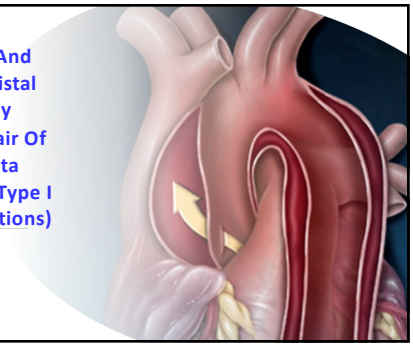
- W.L Gore and associates
- Terumo Aortic
- AbioMed
- Intressa
- Atrivion

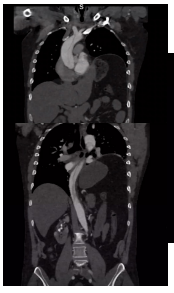
MORE ADVANCES RELATED TO TREATING PATHOLOGY INVOLVING THE ASCENDING AORTA AND THE AORTIC ARCH; AORTIC DISSECTIONS, INTRAMURAL HEMATOMES (IMHS) AND THEIR TREATMENT



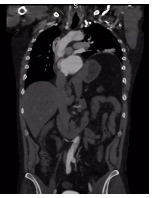
With TAAD When And How Should The Distal Aorta Be Treated By TEVAR Before Repair Of The Ascending Aorta (pertinent only to Type I acute aortic dissections)

Type II ascending dissection are excluded





Acute Type I aortic dissection



39 y old MARFAN with h/o HTN chest and abdominal pain, lactate 8.3mmol/l, no pericardiac effusion. Suspected visceral malperfusion. **NOW WHAT??**

American Heart Association.

2022 AHA/ACC Guideline for the Diagnosis and Management of Aortic Disease

Isselbacher, Preventza, Black et al: 2022 Circulation

One of the top 10 messages

Patients with acute type A aortic dissection, if clinically stable, should be considered for transfer to a high-volume aortic center to improve survival

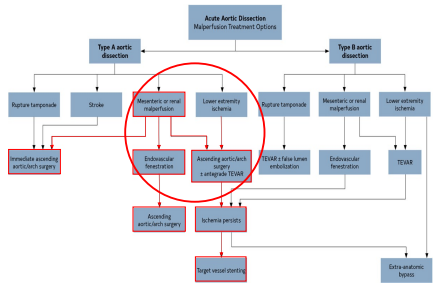
The operative repair of type A aortic dissection should entail at least an open distal anastomosis rather than just a simple supracoronary interposition graft

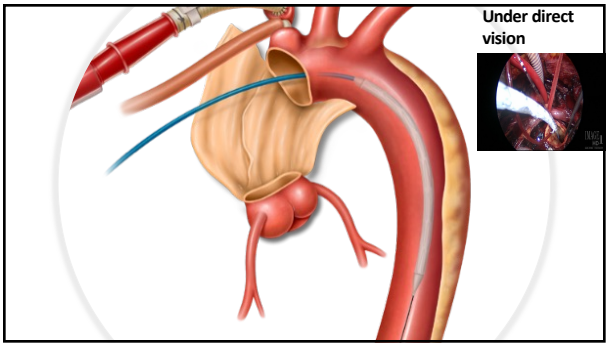
COR	LOE	RECOMMENDATION
1	B-NR	In patients with acute Type A aortic dissection undergoing aortic repair an open distal anastomosis is recommended to improve survival and thrombosis of the false lumen

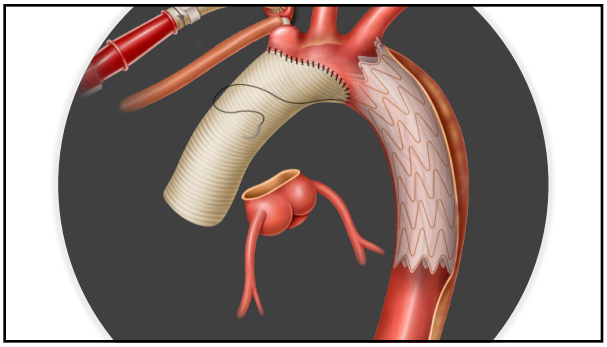
American Heart Association.

2022 AHA/ACC Guideline for the Diagnosis and Management of Aortic Disease

Isselbacher, Preventza, Black et al: 2022 Circulation







Stent-Graft Delivery For Treating Acute Type A Dissection

Antegrade or retrograde delivery

Hybrid proximal surgery plus adjunctive retrograde endovascular repair in acute DeBakey type I dissection: Superior outcomes to conventional surgical repair — JTCVS

Antegrade Thoracic Stent Grafting During Repair of Acute DeBakey I Dissection Prevents Development of Thoracoabdominal Aortic Aneurysms — ATS

Acute type I aortic dissection: Traditional versus hybrid repair with antegrade stent delivery to the descending thoracic aorta — JTCVS

Combining Classic Surgery With Descending Stent Grafting for Acute DeBakey Type I Dissection — ATS

Acute type I aortic dissection: Traditional versus hybrid repair with antegrade stent delivery to the descending thoracic aorta — JTCVS

In our original study

May be could help patients with malperfusion

Comparative Study. J Thorac Cardiovasc Surg. 2014 Jul;148(1):119-25. doi: 10.1016/j.jtcvs.2013.07.055. Epub 2013 Sep 14.

Acute type I aortic dissection: traditional versus hybrid repair with antegrade stent delivery to the descending thoracic aorta

Ourania Preventza, Roberto Cervera, Denton A Cooley, Faisal G Bakaeen, Ahmed S Mohamed, Benjamin Y C Cheong, Lorraine Cornwell, Katherine H Simpson, Joseph S Coselli

Affiliations + expand

PMID: 24041767 DOI: 10.1016/j.jtcvs.2013.07.055

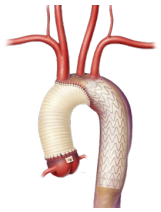
Free article

Abstract

Objective: We compared the short-term outcomes between patients who had undergone classic repair for type I aortic dissection and those who had undergone concomitant antegrade stenting in the descending thoracic aorta.

Methods: From January 2005 to December 2012, 112 patients were treated for acute type I aortic dissection. Eighty-seven patients (group A) underwent traditional operations on the ascending and proximal arch (n = 79, 90.8%), total arch (n = 7, 8.1%), or ascending aorta (n = 1, 1.2%). Twenty-five patients (group B) underwent ascending and proximal arch repair and antegrade stent grafting in the descending thoracic aorta. Various concomitant procedures were performed in both groups. The circulatory arrest times were similar between the 2 groups.

Results: The 30-day mortality was 13.8% (n = 12) in group A and 12% (n = 3) in group B. Nine patients in group A (10.3%) and 3 in group B (12%) experienced a postoperative stroke. In group A, 1 patients (1.5%) developed transient spinal cord ischemia. and in group B, 2 patients had transient



Preventza et al : JTCVS 2014

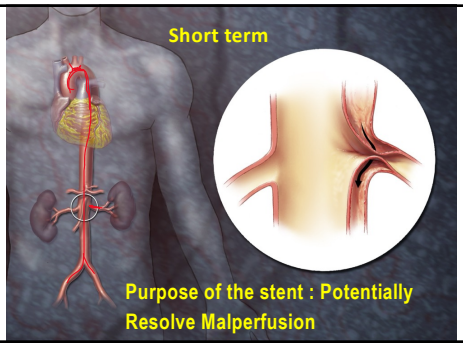
Hybrid Repair of Type A Aortic Dissection

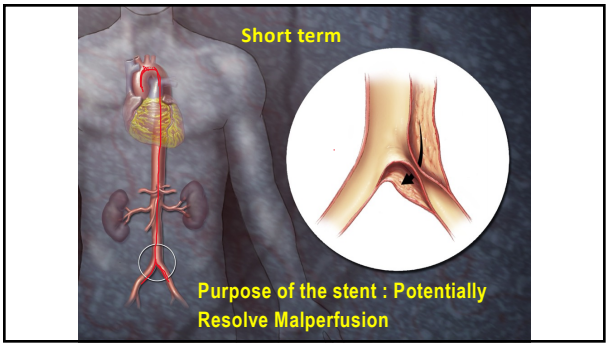
Acute type I aortic dissection: Traditional versus hybrid repair with antegrade stent delivery to the descending thoracic aorta

112 pts
87 pts (hemiarch, total arch)
25 pts (hemiarch and TEVAR)
Use of 10 cm and 15 cm of C TAG

Transient SCI	1.5%	non stented group
	8.0%	stented group p=0.24
Malperfusion resolved	54.2%	non stented pts
	84.2%	stented group p <0.037

Preventza et al : JTCVS 2014





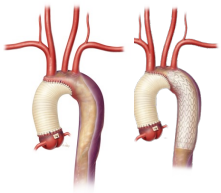
Hybrid Repair of Type A Aortic Dissection

Acute type I aortic dissection with or without antegrade stent delivery: Mid-term outcomes

Ourania Preventza [1], Jacqueline K Olive [2], Jane L Liao [2], Vicente Orozco-Sevilla [3], Katherine Simpson [2], Meredith R Rodriguez [4], Matt D Price [4], Benjamin Y Cheong [5], Subhasis Chatterjee [2], Kim I de la Cruz [3], Hiruni S Amarasekara [4], Scott A LeMaire [6], Joseph S Coselli [3]

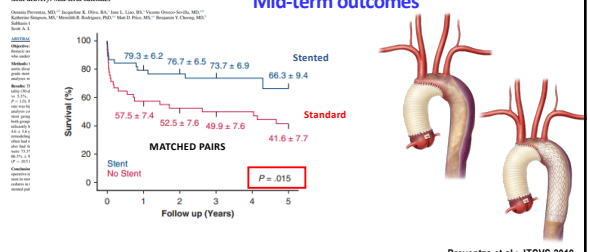
Affiliations + expand

PMID: 30955955 DOI: 10.1016/j.jtcvs.2018.11.145



Stroke
30- day mortality ↑ Standard group (ns)
Transient paraparesis ↑ Hybrid group (s)

Preventza et al : JTCVS 2019



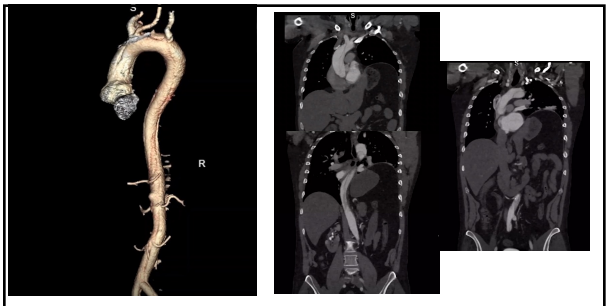
Acute type I aortic dissection with or without antegrade stent delivery: Mid-term outcomes

Preventza et al : JTCVS 2019

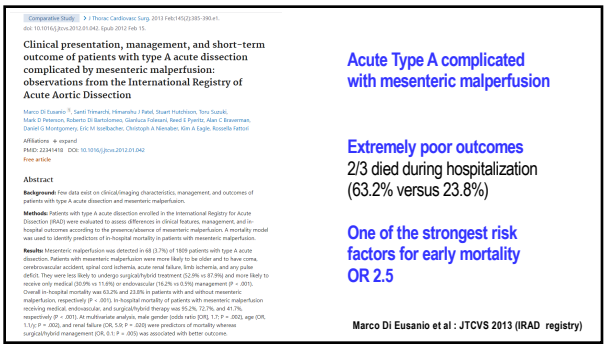
Imaging data and fate of the false lumen : Mid- term outcomes

CT finding	Overall n=121	Stent n=52	Non stent n=69	P value
Stent area FL thrombosis		37 (71.2)	NA	NA
DTA complete thrombosis and remodeling	53 (43.8)	33 (63.5)	20 (29.0)	.0002

Preventza et al : JTCVS 2019



39 y old MARFAN with h/o HTN chest and abdominal pain



Clinical presentation, management, and short-term outcome of patients with type A acute dissection complicated by mesenteric malperfusion: observations from the International Registry of Acute Aortic Dissection

Marco Di Eusanio [1], Santi Trimarchi, Himanshu J Patel, Stuart Hutchison, Toru Suzuki, Mark D Peterson, Roberto Di Bartolomeo, Gianluca Folesani, Reed E Pyeritz, Alan C Braverman, Daniel G Montgomery, Eric M Isselbacher, Christoph A Nienaber, Kim A Eagle, Rossella Fattori

Affiliations + expand

PMID: 22341418 DOI: 10.1016/j.jtcvs.2012.01.042
Free article

Abstract

Background: Few data exist on clinical/imaging characteristics, management, and outcomes of patients with type A acute dissection and mesenteric malperfusion.

Methods: Patients with type A acute dissection enrolled in the International Registry for Acute Dissection (IRAD) were evaluated to assess differences in clinical features, management, and in-hospital outcomes according to the presence/absence of mesenteric malperfusion. A mortality model was used to identify predictors of in-hospital mortality in patients with mesenteric malperfusion.

Results: Mesenteric malperfusion was detected in 68 (3.7%) of 1809 patients with type A acute dissection. Patients with mesenteric malperfusion were more likely to be older and to have coma, cerebrovascular accident, spinal cord ischemia, acute renal failure, limb ischemia, and any pulse deficit. They were less likely to undergo surgical/hybrid treatment (52.9% vs 87.9%) and more likely to receive only medical (20.0% vs 11.6%) or endovascular (16.2% vs 0.5%) management (P < .001). Overall in-hospital mortality was 63.2% and 23.8% in patients with and without mesenteric malperfusion, respectively (P < .001). In-hospital mortality of patients with mesenteric malperfusion receiving medical, endovascular, and surgical/hybrid therapy was 95.2%, 72.7%, and 41.7%, respectively (P < .001). At multivariate analysis, male gender [odds ratio (OR), 1.7; P = .002], age (OR, 1.1/y; P = .002), and renal failure (OR, 5.0; P = .020) were predictors of mortality whereas surgical/hybrid management (OR, 0.1; P = .005) was associated with better outcome.

Acute Type A complicated with mesenteric malperfusion

Extremely poor outcomes
2/3 died during hospitalization
(63.2% versus 23.8%)

One of the strongest risk factors for early mortality
OR 2.5

Marco Di Eusanio et al : JTCVS 2013 (IRAD registry)

DEBATE

Significance of malperfusion syndromes prior to contemporary surgical repair for acute type A dissection: outcomes and need for additional revascularizations

Management of visceral malperfusion complicat with acute type A aortic dissection

Is acute type A aortic dissection a true surgical emergency?

Hybrid operating room concept for combined diagnostics, intervention and surgery in acute type A dissection

Provisional extension to induce complete attachment of an endovascular repair for acute type A aortic dissection with visceral malperfusion

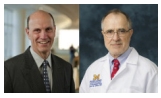
With TAAD When And How Should The Distal Aorta Be Treated By TEVAR Before Repair Of The Ascending Aorta

Debate : Regarding the management and timing of aortic repair

General consencus :

- Early reperfusion is critical for mesenteric malperfusion
- It is not clear whether initial central aortic repair or percutaneous and/or extra-anatomic reperfusion best accomplishes that end

Surgical delay for acute type A dissection with malperfusion



In 1994 U of Michigan concept

Treat the malperfusion first with an endovascular approach followed by delayed open aortic repair once the patients recovered from malperfusion syndrome

Deeb, Williams at al : ATS 1997

Endovascular Fenestration/Stenting First Followed by Delayed Open Aortic Repair for Acute Type A Aortic Dissection With Malperfusion Syndrome

- **Immediate OR is the strategy to prevent death from aortic rupture** for the majority of patients with acute type A aortic dissection
- **However, relatively stable (no rupture, no tamponade) patients with MPS benefit from a staged approach**: upfront endovascular reperfusion followed by aortic OR at resolution of organ failure.

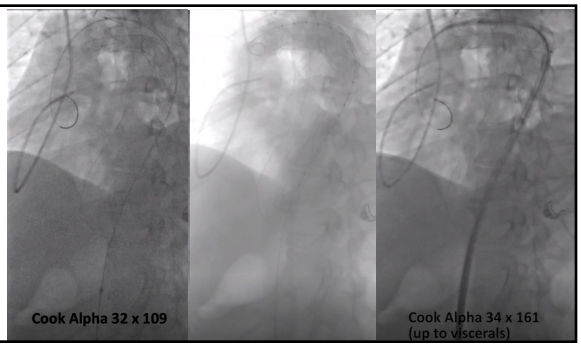
1996 to 2017

- The risk of dying from organ failure was 6.6 times higher
- mortality from aortic rupture decreased from 16% to 4% (P=0.05)

Role of TEVAR-Petticoat concept: First line on acute Type I aortic dissection with visceral compromised

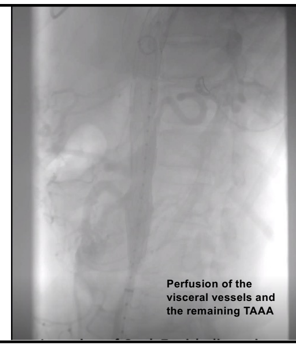
- On admission
  - WBC 22.9, Hb 15gm/dl , creatinine 1.71 mg/gl, lactate 8.3 mmol/l
  - Aortic root (sinus of Valsalva) 4.4 cm , mild aortic regurgitation, no pericardial effusion

Due to suspected visceral malperfusion ,pt was taken to OR for TEVAR- Petticoat first line approach



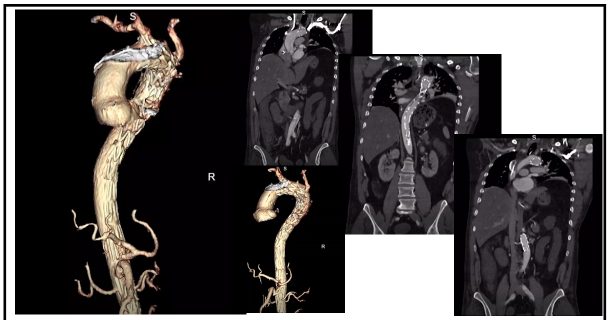
Insertion of the Cook Zenith dissection system 36x180 across viscerals

Occlusion of the infrarenal aorta



Cook Zenith dissection system 36x180 across viscerals

Before the deployment of the dissection system



Post op CT scan: Perfusion thoughout the visceral vessels with stable ascending dissection

Lactate level reduced to 1.0 mmol/l over the next few days

Post op 6 patient was taken to the OR for definite repair:

Modified Bentall, ascending, proximal arch

With TAAD When And How Should The Distal Aorta Be Treated By TEVAR Before Repair Of The Ascending Aorta

- **Petticoat strategy as a first line approach in cases of acute Type I aortic dissection with visceral malperfusion can be life saving**

Provisional extension to induce complete attachment of an endovascular repair for acute type A aortic dissection with visceral malperfusion

Check for updates

Ourania Preventza, MD,[a,b] Oluyinka O. Olutoye II, MD, MPH,[c] Subhasis Chatterjee, MD,[b,c] Alice Le Huu, MD,[b] and Joseph S. Coselli, MD,[a,b] Houston, Tex

From the Divisions of [a]Cardiothoracic Surgery and [c]General Surgery, Michael E. DeBakey Department of Surgery, Baylor College of Medicine, Houston, Tex; and [b]Department of Cardiovascular Surgery, Texas Heart Institute, Houston, Tex.

Disclosures: Dr Coselli participates in clinical trials with GlaxoSmithKline, Edward Lifesciences, CytoSorbents, Bolton Medical, Vascutek Terumo, Medtronic Inc., W. L. Gore & Associates, and Cook, Inc; Dr LeMaire, with Medtronic, Inc, W. L. Gore & Associates, Vascutek Terumo, CytoSorbents, and Baxter Healthcare; and Dr Preventza, with Medtronic, Inc, and W. L. Gore & Associates. All other authors reported no conflicts of interest.

The *Journal* policy requires editors and reviewers to disclose conflicts of interest and to decline handling or reviewing manuscripts for which they may have a conflict of interest. The editors and reviewers of this article have no conflicts of interest.

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Address for reprints: Ourania Preventza, MD, Baylor College of Medicine, One Baylor Plaza, BCM 390, Houston, TX 77030 (E-mail: preventz@bcm.edu).

JTCVS Techniques 2020;3:61-3
2666-2507

https://doi.org/10.1016/j.xjtc.2020.06.046

PETTICOAT for visceral malperfusion before proximal repair for type A aortic dissection.

CENTRAL MESSAGE

We used the first-line PETTICOAT strategy with the Zenith Dissection Endovascular System for acute type A aortic dissection and visceral malperfusion, followed by proximal aortic replacement.

See Commentaries on pages 64 and 66.

Video clip is available online.

Patients with type A aortic dissection (AAD) and mesenteric malperfusion have greater in-hospital mortality risk than patients with AAD without mesenteric malperfusion (63% vs 24%).[1] Using the PETTICOAT (provisional extension to induce complete attachment) technique as a first-line strategy before proximal repair, we resolved our

right renal arteries resulted in occlusion of these vessels. Transthoracic echocardiography confirmed AAD, mild aortic

Preventza et al : JTCVS 2020

With TAAD When And How Should The Distal Aorta Be Treated By TEVAR Before Repair Of The Ascending Aorta

- If there is evidence of clinical or radiologic malperfusion (renal of lower extremities) antegrade TEVAR (vs total arch with FET)
- If subclinical radiographic visceral malperfusion alone should be treated with immediate proximal aortic repair (± antegr/retrogr TEVAR or arch FET)
- If advanced visceral malperfusion syndrome with clinical or biochemical evidence of liver or bowel necrosis and concomitant hemodynamic stability (no aortic rupture or tamponade) are the subgroup of patients for whom a visceral-first strategy can be beneficial
  - *Two main strategies : Endovascular fenestration and a TEVAR first approach*
    - Fenestration may also needs stenting, branch vessel thrombolysis, or suction thromboembolectomy to address the static components of malperfusion

Thank you

opreventza@virginia.edu

@OPreventzaMD

November 19-23 2024

MORE ADVANCES RELATED TO TREATING PATHOLOGY INVOLVING THE ASCENDING AORTA AND THE AORTIC ARCH; AORTIC DISSECTIONS, INTRAMURAL HEMATOMES (IMHS) AND THEIR TREATMENT