대한심장혈관흉부외과학회
The Korean Society for Thoracic & Cardiovascular Surgery
The 38th KTCVS
Spring Meeting
2024 SEOUL
AAPCHS
The 4th AAPCHS
May 31st - June 1st
Seoul Dragon City Hotel

Management for acute type B aortic dissection

김홍래

Department of Thoracic and Cardiovascular Surgery
University of Ulsan College of Medicine, Asan Medical Center

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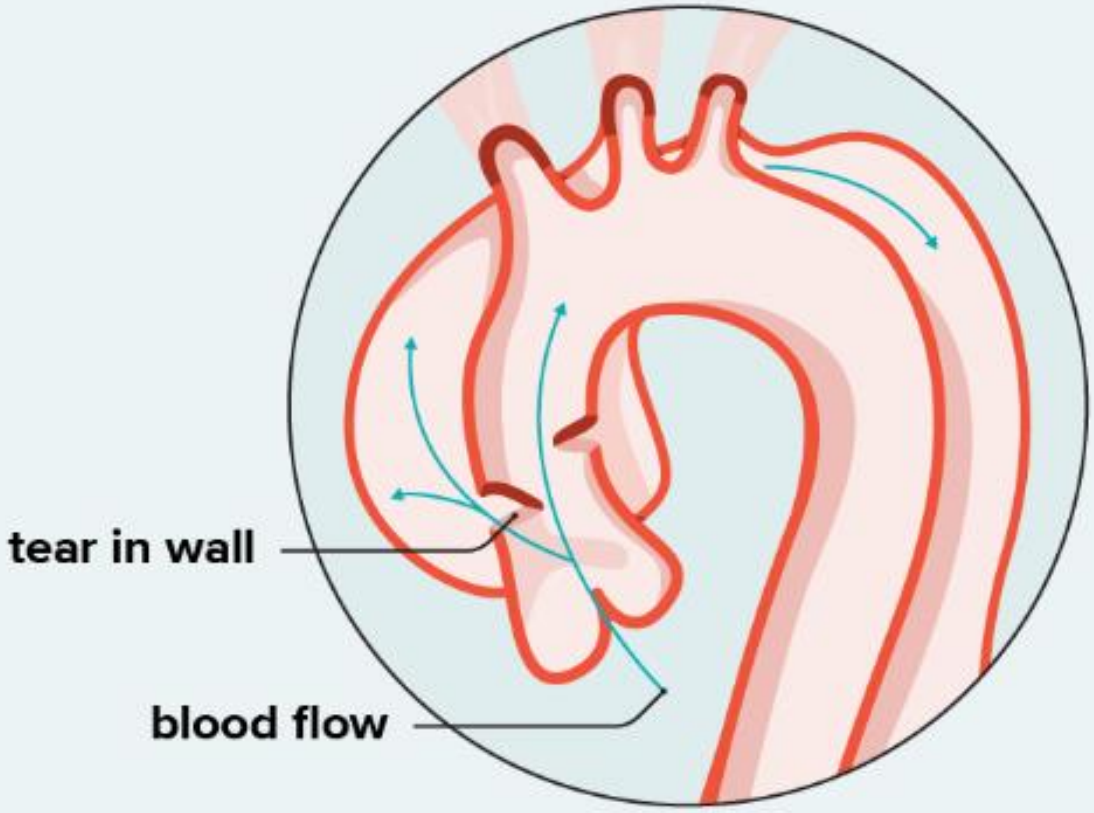
Aortic Dissection



Dissection of the Aorta: Types, Symptoms & Treatment (healthline.com)

Tear in the intima

▼

High-pressure flow of blood between the layers of the aorta

▼

Creating a true and false lumen

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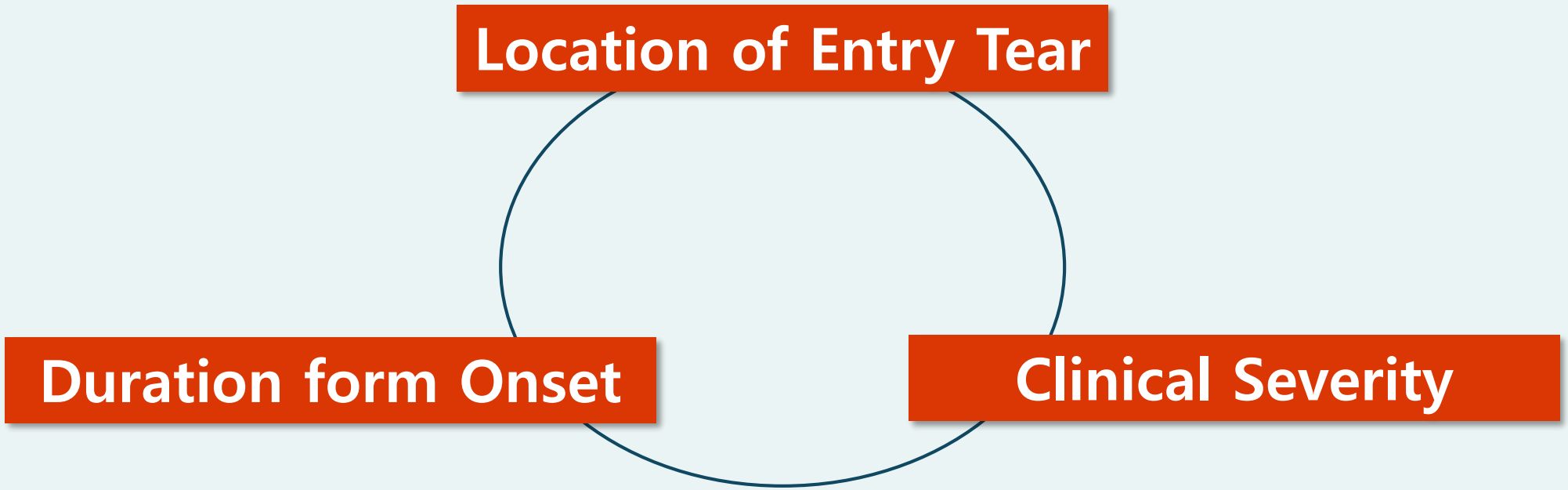
Treatment

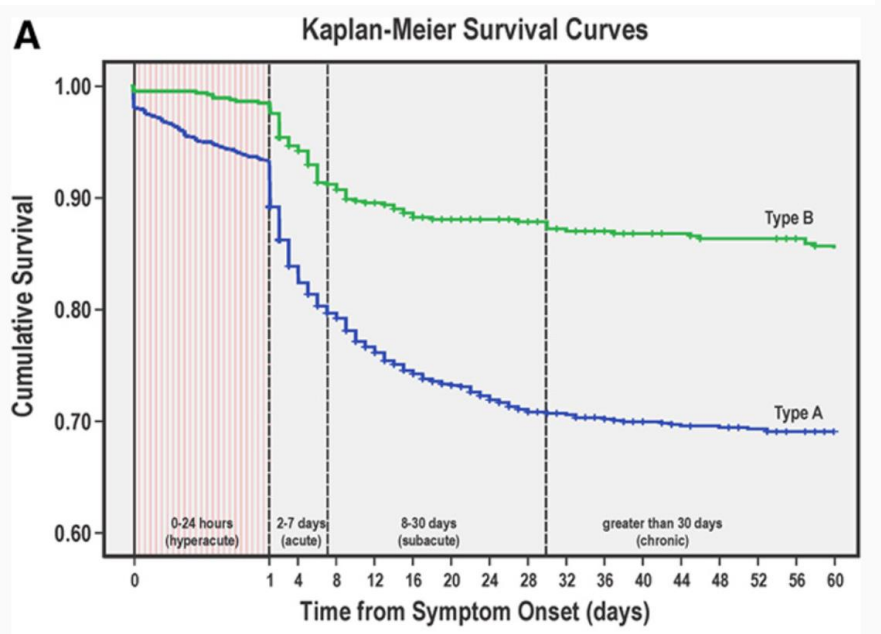


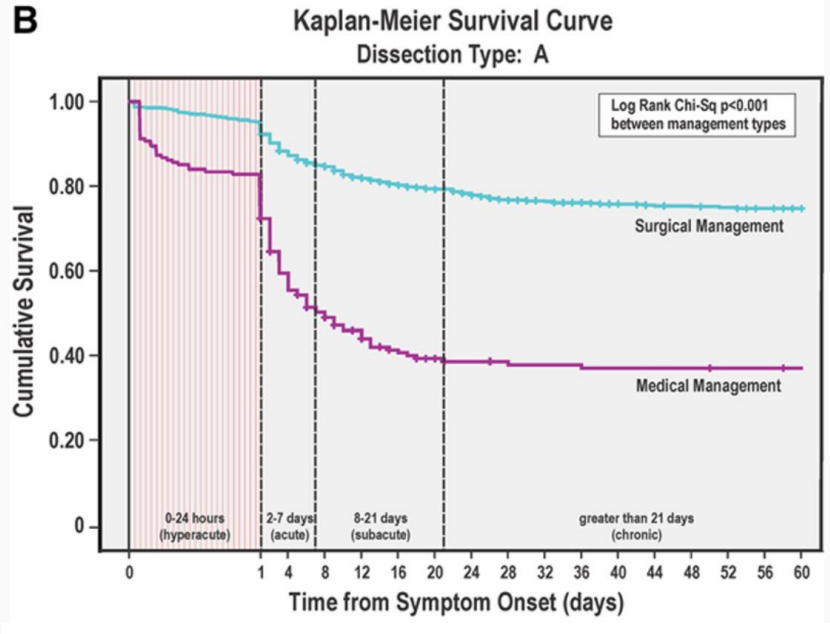
Insights From the International Registry of Acute Aortic Dissection

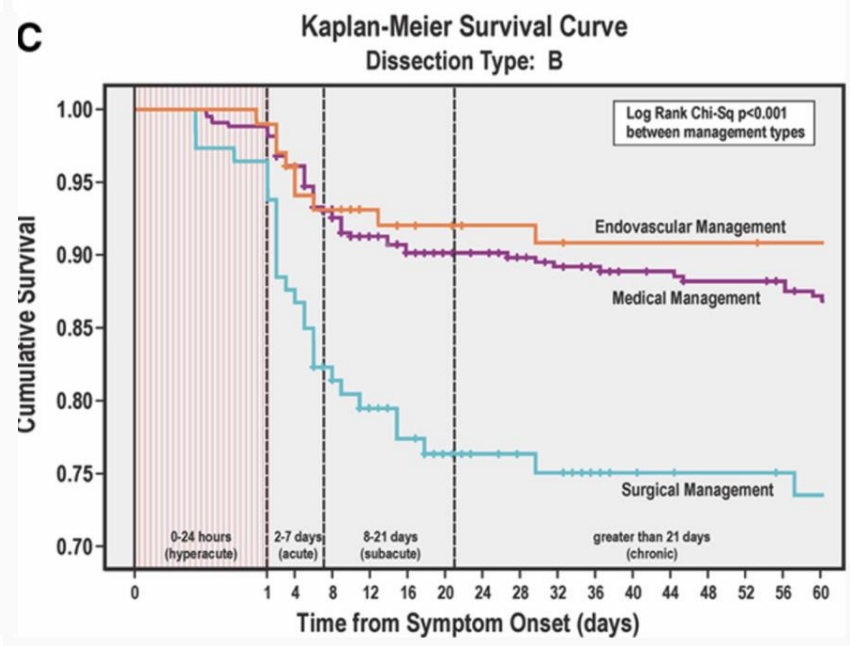
A 20-Year Experience of Collaborative Clinical Research

Arturo Evangelista, Eric M. Isselbacher, Eduardo Bossone, Thomas G. Gleason, Marco Di Eusanio, Udo Sechtem, Marek P. Ehrlich, Santi Trimarchi, Alan C. Braverman, Truls Myrmel, Kevin M. Harris, Stuart Hutchinson, Patrick O'Gara, Toru Suzuki, Christoph A. Nienaber and Kim A. Eagle ✉
and on behalf of the IRAD Investigators

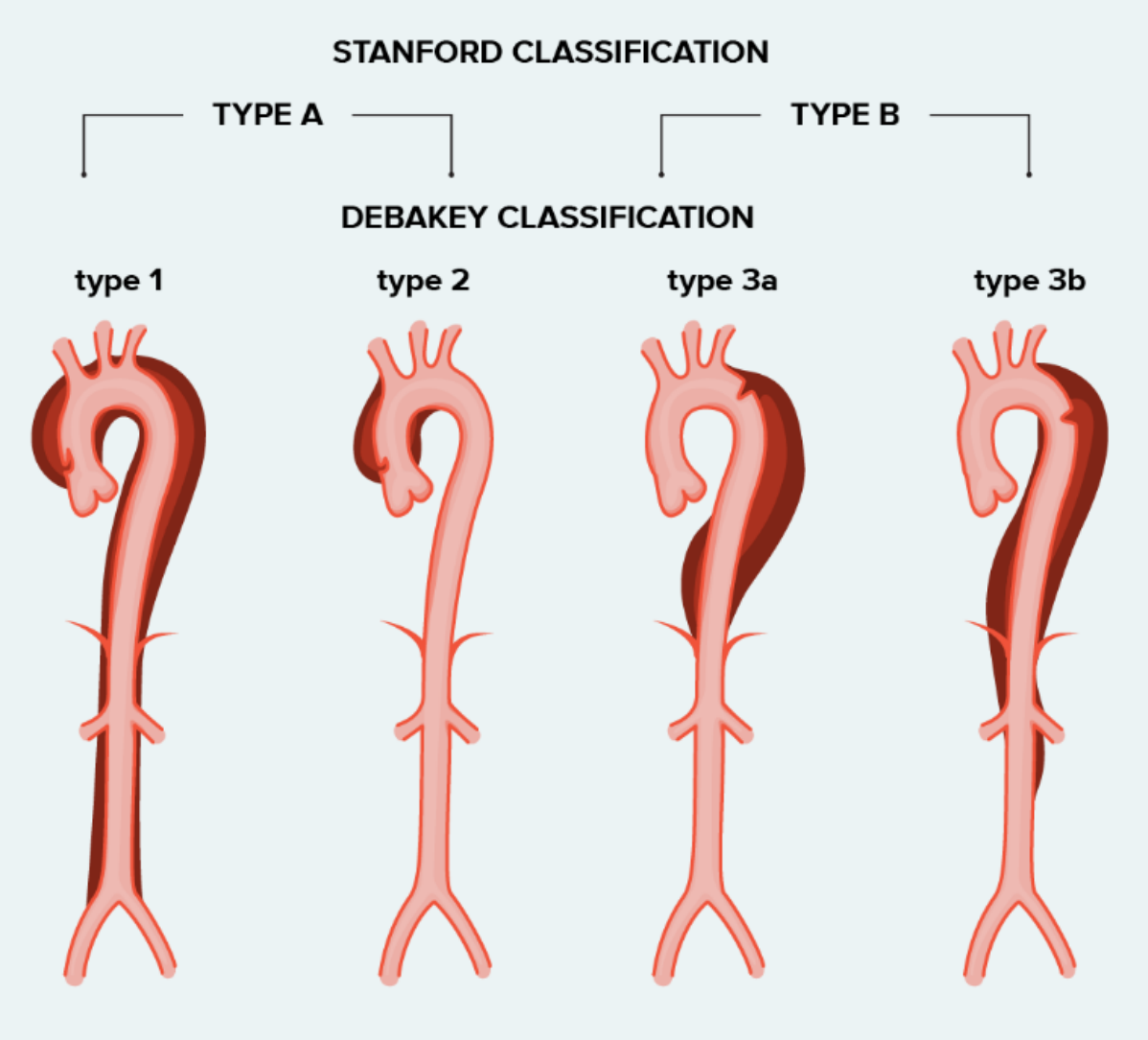
Originally published 24 Apr 2018 | https://doi-org-ssl.libproxy.amc.seoul.kr/10.1161/CIRCULATIONAHA.117.031264 | Circulation. 2018;137:1846–1860



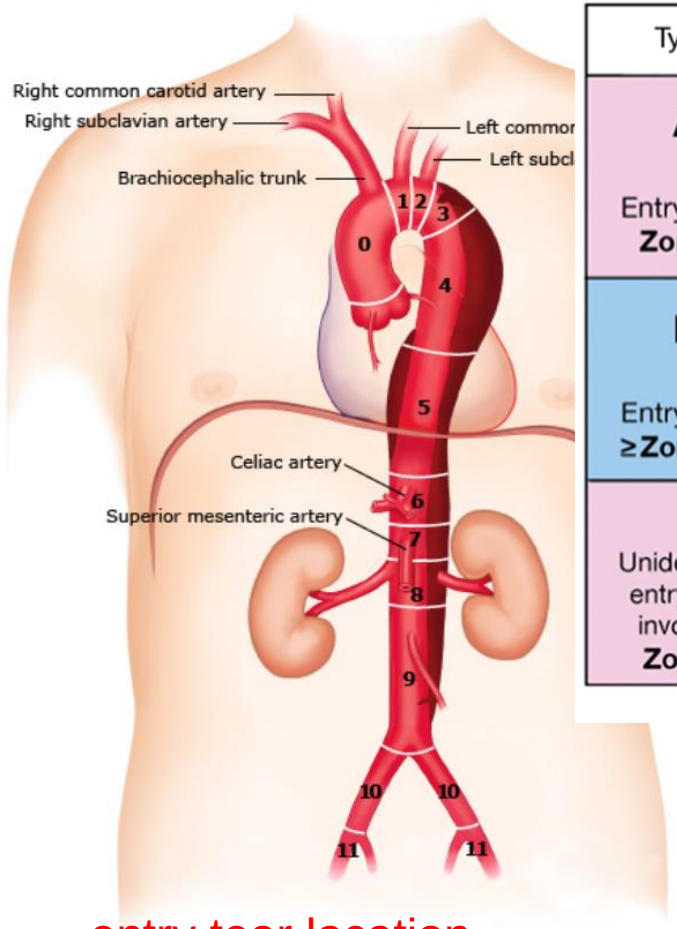




Location



SVS/STS classification of aortic dissection by zone[1]



Type	Proximal Extent	Distal Extent
A_D Entry tear: **Zone 0**	0	0
	1	1
	2	2
	3	3
	4	4
B_{PD} Entry tear: **≥Zone 1**	5	5
	6	6
	7	7
	8	8
	9	9
I_D Unidentified entry tear involving **Zone 0**	10	10
	11	11
	12	12

entry tear location

+ TEM

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Duration

SVS/STS reporting guidelines

- Hyperacute: < 24hr
- Acute: 1 to 14 days
- Subacute: 15 to 90 days
- Chronic: >90 days

Behavior of the dissection flap overtime (thin <>thick)

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Clinical Severity

Uncomplicated
No rupture
No malperfusion
No high-risk features
High risk
Refractory pain
Refractory hypertension
Bloody pleural effusion
Aortic diameter >40 mm
Radiographic only malperfusion
Readmission
Entry tear: lesser curve location
False lumen diameter >22 mm
Complicated
Rupture
Malperfusion

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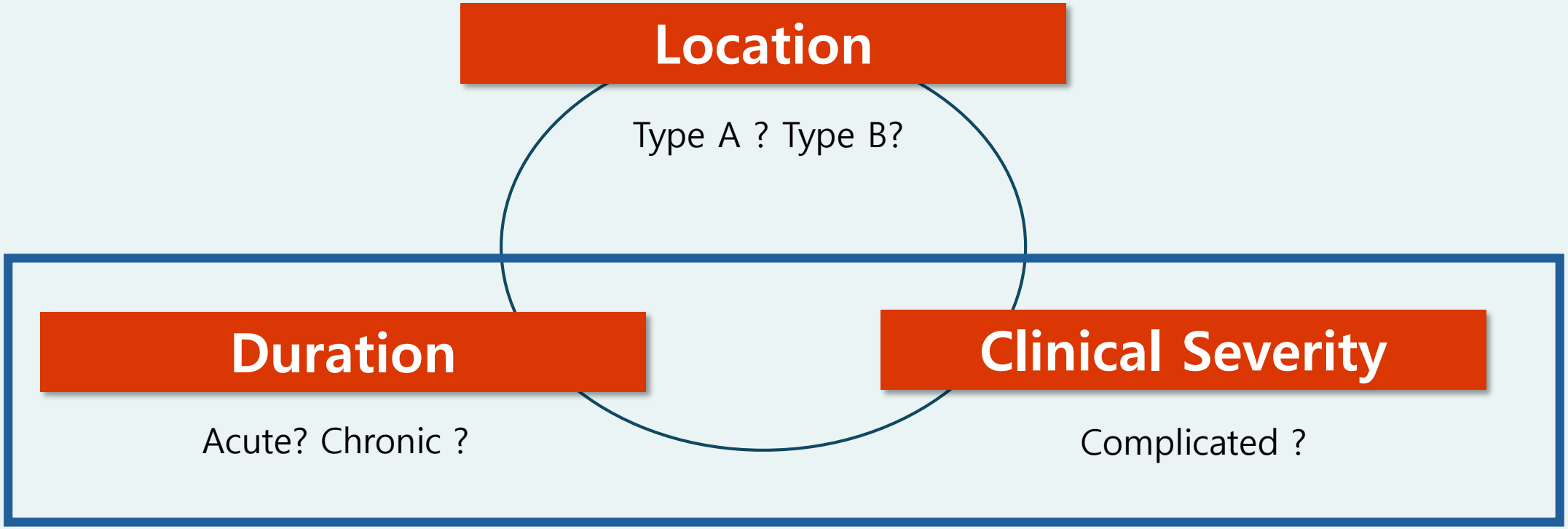
Treatment



Acute Complicated
Acute Uncomplicated
Chronic

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MEDICAL MANAGEMENT

Optimal medical therapy

Pain control + Anti-impulse therapy

heart rate (< 60) blood pressure (< 120/80)

Imaging surveillance

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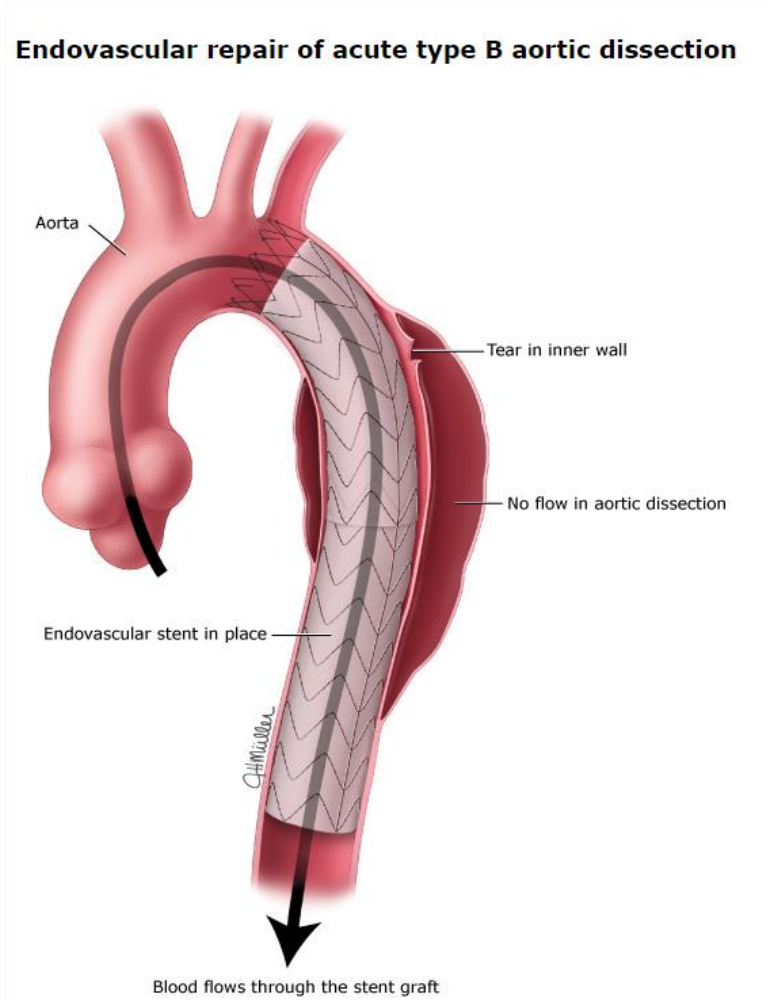
Endovascular



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Neurological event rates and associated risk factors in acute type B aortic dissections treated by thoracic aortic endovascular repair

Benedikt Reutersberg, MD,[a] Thomas Gleason, MD,[b] Nimesh Desai, PhD,[c] Marek Ehrlich, PhD,[d] Arturo Evangelista, PhD,[e] Alan Braverman, MD,[f] Truls Myrmel, PhD,[g] Edward P. Chen, MD,[h] Anthony Estrera, MD,[i] Marc Schermerhorn, MD,[j] Eduardo Bossone, PhD,[k] Chih-Wen Pai, PhD,[l] Kim Eagle, MD,[l] Thoralf Sundt, MD,[m] Himanshu Patel, MD,[n] Santi Trimarchi, PhD,[o] and Hans-Henning Eckstein, MD,[a] on behalf of the IRAD Investigators

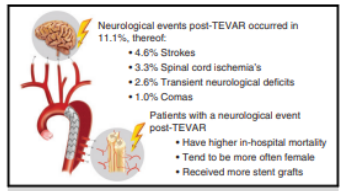
ABSTRACT

Objectives: Thoracic endovascular aortic repair is the method of choice in patients with complicated type B acute aortic dissection. However, thoracic endovascular aortic repair carries a risk of periprocedural neurological events including stroke and spinal cord ischemia. We aimed to look at procedure-related neurological complications within a large cohort of patients with type B acute aortic dissection treated by thoracic endovascular aortic repair.

Methods: Between 1996 and 2021, the International Registry of Acute Aortic Dissection collected data on 3783 patients with type B acute aortic dissection. For this analysis, 648 patients with type B acute aortic dissection treated by thoracic endovascular aortic repair were included (69.4% male, mean age 62.7 ± 13.4 years). Patients were excluded who presented with a preexisting neurologic deficit or received adjunctive procedures. Demographics, clinical symptoms, and outcomes were analyzed. The primary end point was the periprocedural incidence of neurological events (defined as stroke, spinal cord ischemia, transient neurological deficit, or coma). Predictors for perioperative neurological events and follow-up outcomes were considered as secondary end points.

Results: Periprocedure neurological events were noted in 72 patients (11.1%) and included strokes (n = 29, 4.6%), spinal cord ischemias (n = 21, 3.3%), transient neurological deficits (n = 16, 2.6%), or coma (n = 6, 1.0%). The group with neurological events had a significantly higher in-hospital mortality (20.8% vs 4.3%, $P < .001$). Patients with neurological events were more likely to be female (40.3% vs 29.3%, $P = .077$), and aortic rupture was more often cited as an indication for thoracic endovascular aortic repair (38.8% vs 16.5%, $P < .001$). In patients with neurological events, more stent grafts were used (2 vs 1 stent graft, $P = .002$). Multivariable logistic regression analysis showed that aortic rupture (odds ratio, 3.12, 95% confidence interval, 1.44-6.78, $P = .004$) and female sex (odds ratio, 1.984, 95% confidence interval, 1.031-3.817, $P = .040$) were significantly associated with perioperative neurological events.

Conclusions: In this highly selected group from dedicated aortic centers, more than 1 in 10 patients with type B acute aortic dissection treated by thoracic endovascular aortic repair had neurological events, in particular women. Further research is needed to identify the causes and presentation of these events after thoracic endovascular aortic repair, especially among women. (J Thorac Cardiovasc Surg 2024;167:52-62)



Neurological event rates and associated risk factors in TBAAD treated by TEVAR.

CENTRAL MESSAGE

TEVAR in the treatment of complicated type B aortic dissection carries a greater than 10% risk of periprocedural neurologic events such as stroke and SCI, especially in women.

PERSPECTIVE

The incidence of perioperative neurological events and associated risk factors is relatively high in TBAAD treated with TEVAR and urgently needs improvement. One cause is the sex-dependent risk, which might be due to the smaller body surface area and the resulting need for smaller stent grafts. This seems to still be a problem today, because the industry has not yet developed gender-adapted stent grafts.

See Commentary on page 63.

Neurological event rates and associated risk factors in acute type B aortic dissections treated by TEVAR

Type B treated by TEVAR
n = 648

Neurological Event
(n = 72, 11.1%)

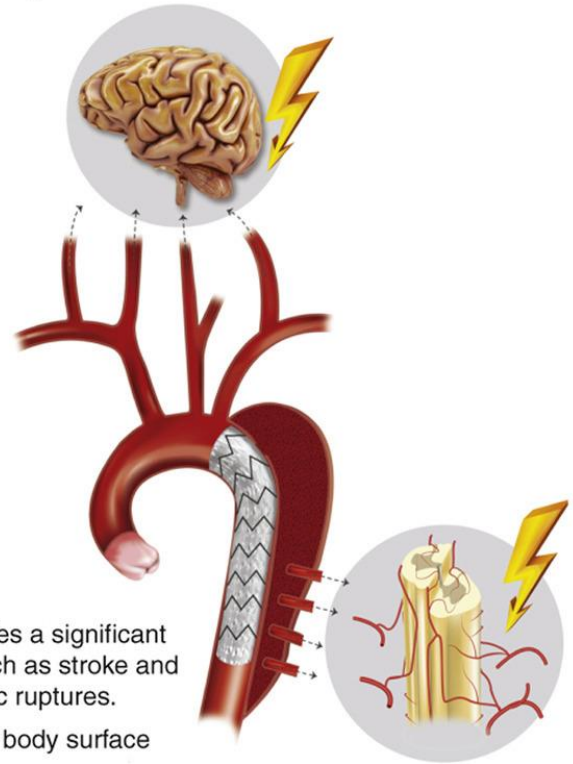
No neurological Event
(n = 576, 88.9%)

Neurological events post-TEVAR included:

- 4.6% Strokes
- 3.3% Spinal cord ischemia's
- 2.6% Transient neurological deficits (TIAs)
- 1.0% Comas

Implications:

- TEVAR in complicated type B aortic dissection carries a significant risk of periprocedural neurologic events (> 11%) such as stroke and spinal cord ischemia, especially in women and aortic ruptures.
- The sex-dependent risk might be due to the smaller body surface area and the resulting need for smaller stent grafts.



TEVAR = Thoracic endovascular aortic repair

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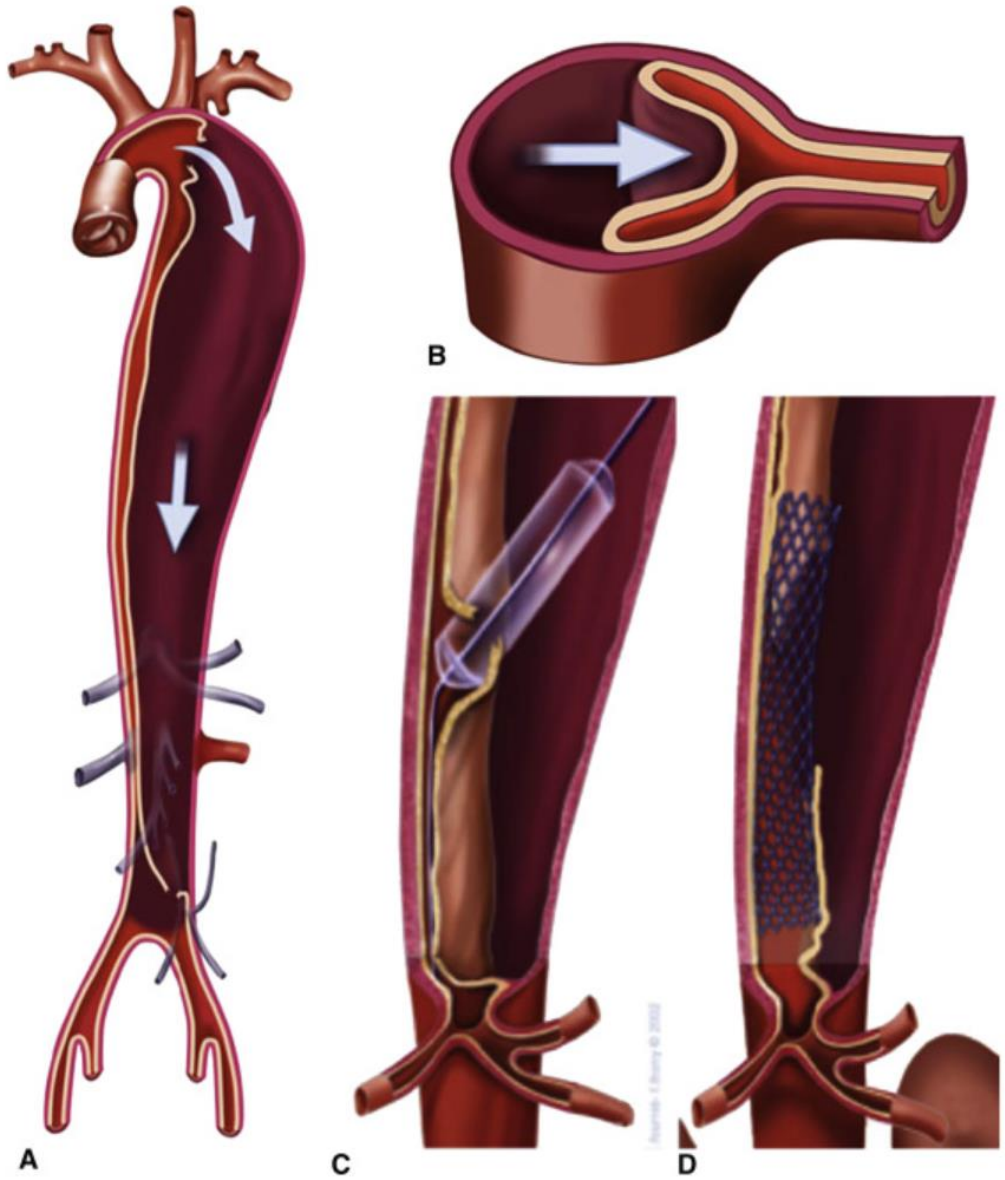
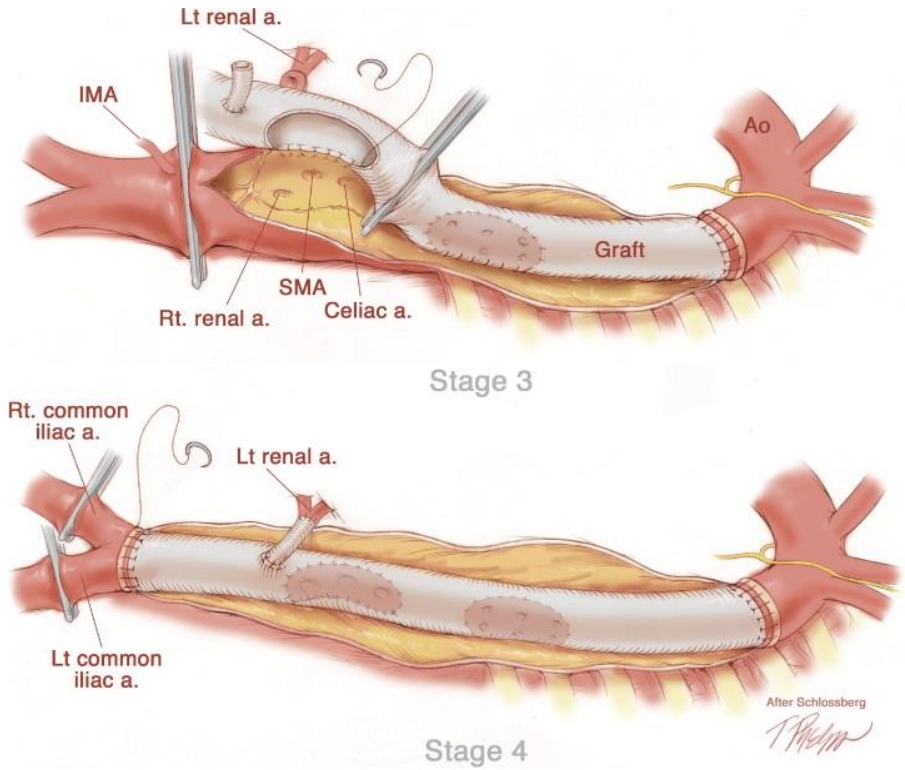
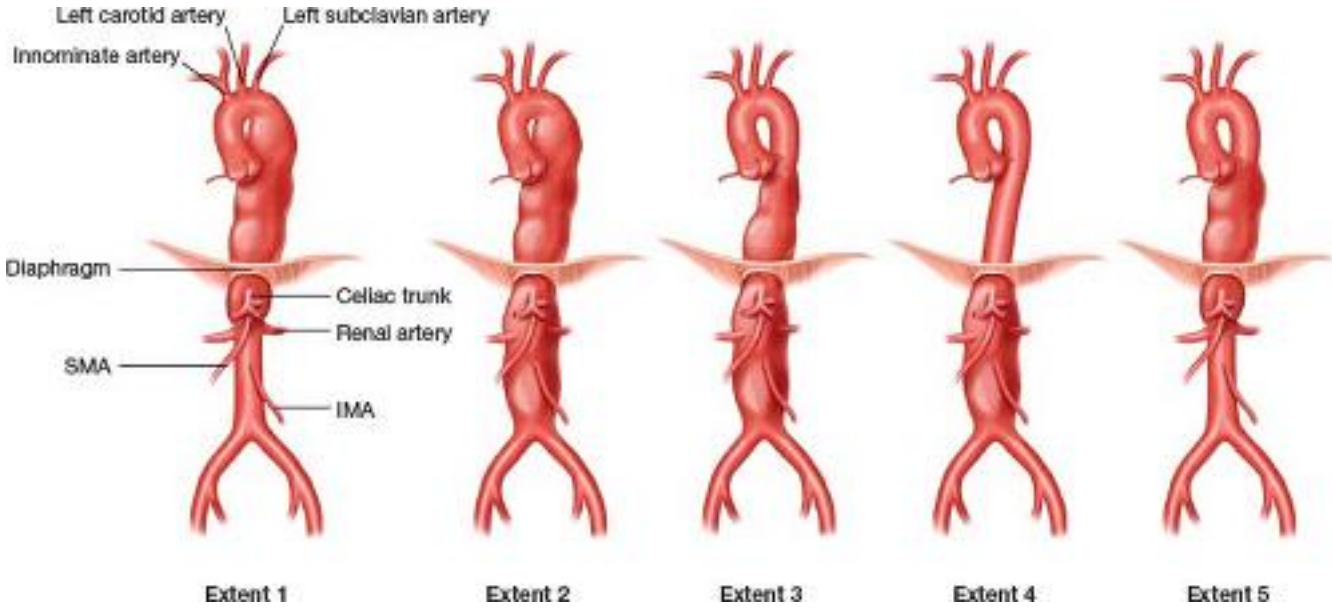


Surgery





Full CPB / Left heart bypass

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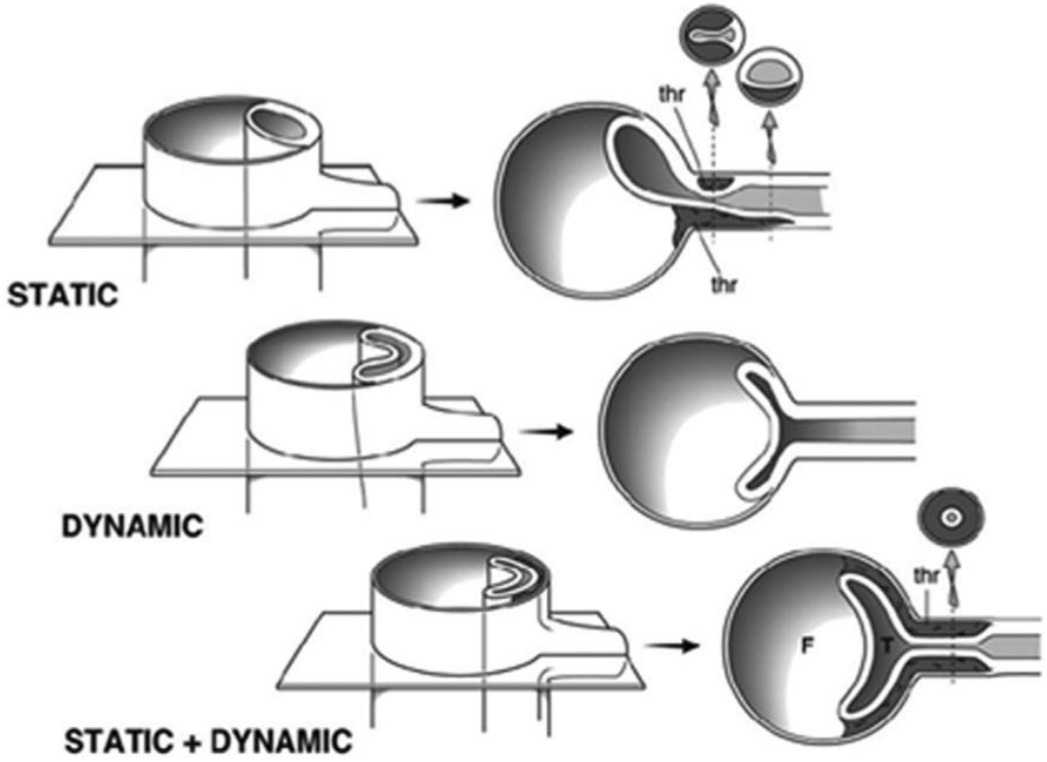
Acute Complicated

80% have dynamic obstruction



TEVAR with coverage of the primary tear and any other major communications between the true lumen and false lumen
> may reverse the malperfusion

TBAD with malperfusion

- In the International Registry for Aortic Dissection (IRAD) data
- visceral ischemia vs. without ischemia in-hospital mortality

30.8% vs 9.1% without ischemia (odds ratio [OR], 3.33; P < .0001)

Increasingly treated with endovascular therapies

from 35% in the early IRAD era 1996-2001

to 68% in the later IRAD era 2008-2013

Fenestration

Long-term results of percutaneous management of malperfusion in acute type B aortic dissection: Implications for thoracic aortic endovascular repair

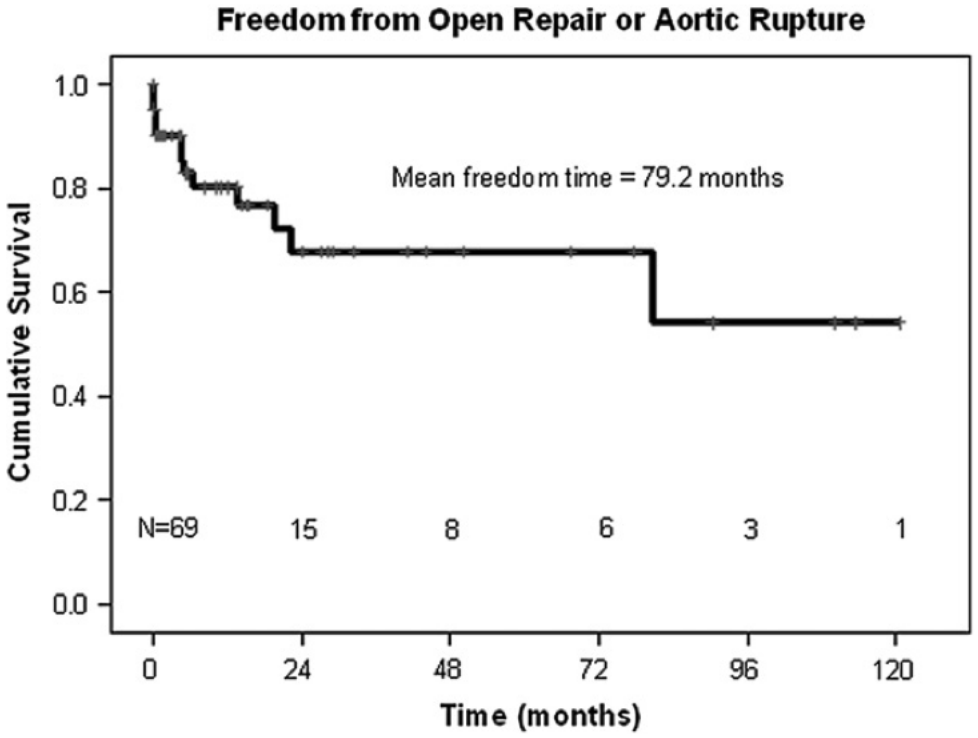
Himanshu J. Patel, MD,[a] David M. Williams, MD,[b] Meir Meekov, BA,[a] Narasimham L. Dasika, MD,[b] Gilbert R. Upchurch, Jr, MD,[a] and G. Michael Deeb, MD[a]

Objective: Open repair for acute type B dissection with malperfusion is associated with significant morbidity. Thoracic aortic endovascular repair has been proposed as a less-invasive therapy for acute type B dissection with malperfusion. Benefits of thoracic aortic endovascular repair include the potential for false lumen thrombosis. Its risks include both early morbidity and mortality, and uncertain late results with potentially unstable landing zones. We present the first long-term analysis of an alternative endovascular approach consisting of percutaneous flap fenestration with true lumen and branch vessel stenting to restore end-organ perfusion.

Methods: Outcomes were analyzed for 69 patients presenting with acute type B dissection with malperfusion from 1997 to 2008. All patients were evaluated with angiography and treated with a combination of flap fenestration, true lumen, or branch vessel stenting where appropriate.

Results: Mean age was 57.3 years. Identified malperfused vascular beds included spinal cord (5), mesenteric (40), renal (51), and lower extremity (47). Major morbidity included dialysis need (11), stroke (3), paralysis (2), and 30-day mortality (n = 12, 17.4%). Mean Kaplan–Meier survival was 84.3 months. Although late mortality was associated with age ($P < .0001$), neither the type nor the number of malperfused vascular beds correlated with vital status at last follow-up ($P > .4$). Freedom from aortic rupture or open repair at 1, 5, and 8 years was 80.2%, 67.7%, and 54.2%, respectively.

Conclusion: Presentation with acute type B dissection with malperfusion carries a significant risk for both early and late mortality. Percutaneous approaches allow for rapid restoration of end-organ perfusion with acceptable results. These long-term results can serve as comparative data by which to evaluate newer therapies for acute type B dissection with malperfusion, such as thoracic aortic endovascular repair.



The Journal of Thoracic and Cardiovascular Surgery • August 2009

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Fenestration

Management of acute type B aortic dissection with malperfusion via endovascular fenestration/stenting

Check for updates

Elizabeth L. Norton, MS,[a] David M. Williams, MD,[b] Karen M. Kim, MD,[c] Minhaj S. Khaja, MD, MBA,[b] Xiaoting Wu, PhD,[c] Himanshu J. Patel, MD,[c] G. Michael Deeb, MD,[c] and Bo Yang, MD, PhD[c]

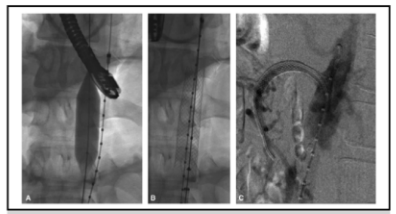
ABSTRACT

Objective: The study objective was to evaluate the management of malperfusion in acute type B aortic dissection with endovascular fenestration/stenting.

Methods: From 1996 to 2018, 182 patients with an acute type B aortic dissection underwent fenestration/stenting for suspected malperfusion based on imaging, clinical manifestations, and laboratory findings. Data were obtained from medical record review and the National Death Index database.

Results: The median age of patients was 55 years. Signs of malperfusion included abdominal pain (61%), lower-extremity weakness (27%), nonpalpable lower-extremity pulses (24%), and abnormal lactate, creatinine, liver enzymes, and creatine kinase levels. Confirmed hemodynamically significant malperfusion affected the spinal cord (2.7%), celiac (24%), superior mesenteric (40%), renal (51%), and iliofemoral (43%) arterial distributions. Of the 182 patients, 99 (54%) underwent aortic fenestration/stenting, 108 (59%) had 1 or multi-branch vessel fenestration/stenting, 5 (2.7%) had concomitant thoracic endovascular aortic repair, 17 (9.3%) had additional thrombolysis or thromboembolectomy, and 48 (26%) received no intervention. After fenestration/stenting, 24 patients (13%) required additional procedures for necrotic bowel or limb and 9 patients (4.9%) had subsequent aortic repair (thoracic endovascular aortic repair, open repair) before discharge. The new-onset paraplegia was 0%. The in-hospital mortality was 7.7% over 20+ years and 0% in the last 8 years. The 5- and 10-year survivals were 72% and 49%, respectively. The significant risk factors for late mortality were age and acute paralysis (hazard ratio, 3.5; both $P < .0001$). Given death as a competing factor, the 5- and 10-year cumulative incidence of reintervention was 21% and 31% for distal aortic pathology, respectively.

Conclusions: Patients with acute type B aortic dissection with malperfusion can be managed with endovascular fenestration/stenting with excellent short- and long-term outcomes. This approach is particularly helpful to patients with static malperfusion of aortic branch vessels. (J Thorac Cardiovasc Surg 2020;160:1151-61)



A, Aortic flap balloon fenestration. B, Thoracic aortic true lumen. C, SMA stenting.

Central Message

Endovascular fenestration/stenting can effectively resolve dynamic and static malperfusion in ATBAD with favorable short- and long-term outcomes (survival and reoperation).

Perspective

Endovascular fenestration/stenting effectively and timely resolves dynamic and static malperfusion in ATBAD with minimal risk of paraplegia and retrograde type A dissection, and excellent in-hospital mortality, cumulative incidence of reintervention, and long-term survival in this patient population as combined with TEVAR or open repair when indicated.

See Commentaries on pages 1162 and 1164.

- 182 pts
- Over a 22-year period (1996-2018),
- the Michigan group reported a 7.7% mortality (no deaths in the last 8 years) and 0% paralysis
- remains a persistent risk for aortic rupture and growth

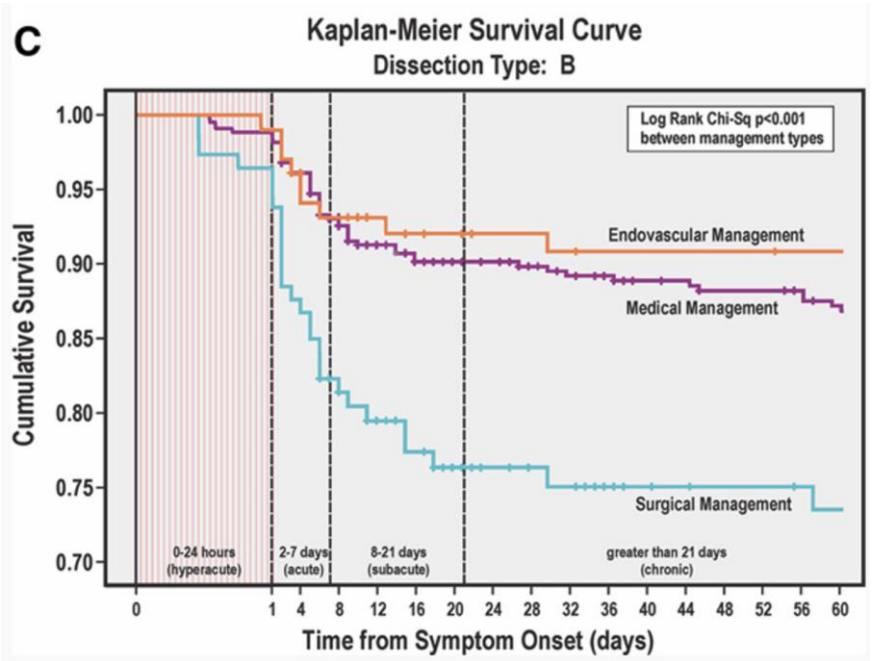
Technically demanding
Time-consuming
Extra visceral stenting

The Society of Thoracic Surgeons/American Association for Thoracic Surgery Clinical Practice Guidelines on the Management of Type B Aortic Dissection

Thomas E. MacGillivray, MD, Thomas G. Gleason, MD, Himanshu J. Patel, MD, Gabriel S. Aldea, MD, Joseph E. Bavaria, MD, Thomas M. Beaver, MD, Edward P. Chen, MD, Martin Czerny, MD, Anthony L. Estrera, MD, Scott Firestone, MS, Michael P. Fischbein, MD, G. Chad Hughes, MD, Dawn S. Hui, MD, Kalie Kissoon, Jennifer S. Lawton, MD, Davide Pacini, MD, T. Brett Reece, MD, Eric E. Roselli, MD, and John Stulak, MD

ACUTE COMPLICATED TBAD

- **TEVAR is indicated for complicated hyperacute, acute, or subacute TBADs with rupture and/or malperfusion and favorable anatomy for TEVAR. (Class of Recommendation [COR] I, Level of Evidence [LOE] B-nonrandomized [NR])**
- **Open surgical repair for complicated hyperacute, acute, or subacute TBADs should be considered for those patients with unsuitable anatomy for TEVAR. (COR IIA, LOE B-NR)**
- **Fenestration may be considered for complicated hyperacute, acute, or subacute TBADs. (COR IIB, LOE C-limited data [LD])**



Uncomplicated

- Optimal medical therapy (OMT)

- However…. a high percentage of patients with TBAD will experience subsequent sequelae resulting in death or requiring intervention

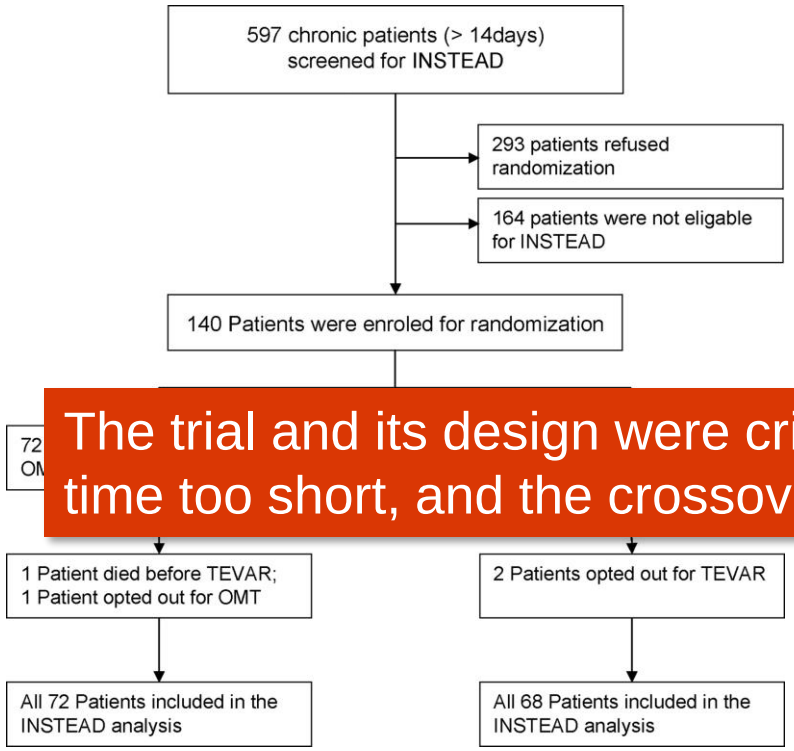
TEVAR vs OMT

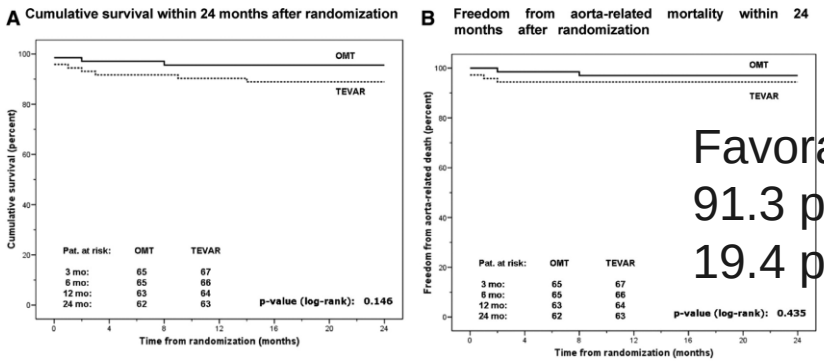
December 22, 2009
Vol 120, Issue 25

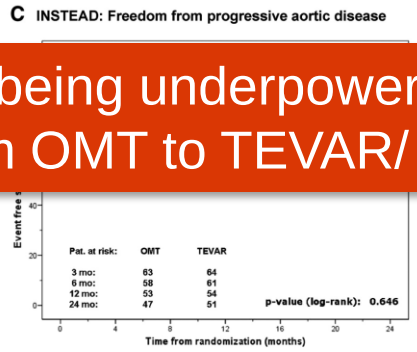
Randomized Comparison of Strategies for Type B Aortic Dissection

The INvestigation of STEnt Grafts in Aortic Dissection (INSTEAD) Trial

Christoph A. Nienaber, Hervé Rousseau, Holger Eggebrecht, Stephan Kische, Rossella Fattori, Tim C. Rehders, Günther Kundt, Dierk Scheinert, Martin Czerny, Tilo Kleinfeldt, Burkhart Zipfel, Louis Labrousse, Hüseyin Ince and
and for the INSTEAD Trial







Favorable aortic remodeling
91.3 percent of the endovascular group
19.4 percent of the medical group

The trial and its design were criticized for being underpowered, the measured outcome time too short, and the crossover rate from OMT to TEVAR/ OMT too high (16.2%).

primary end point was all cause mortality at 2 years >>>>>>Similar

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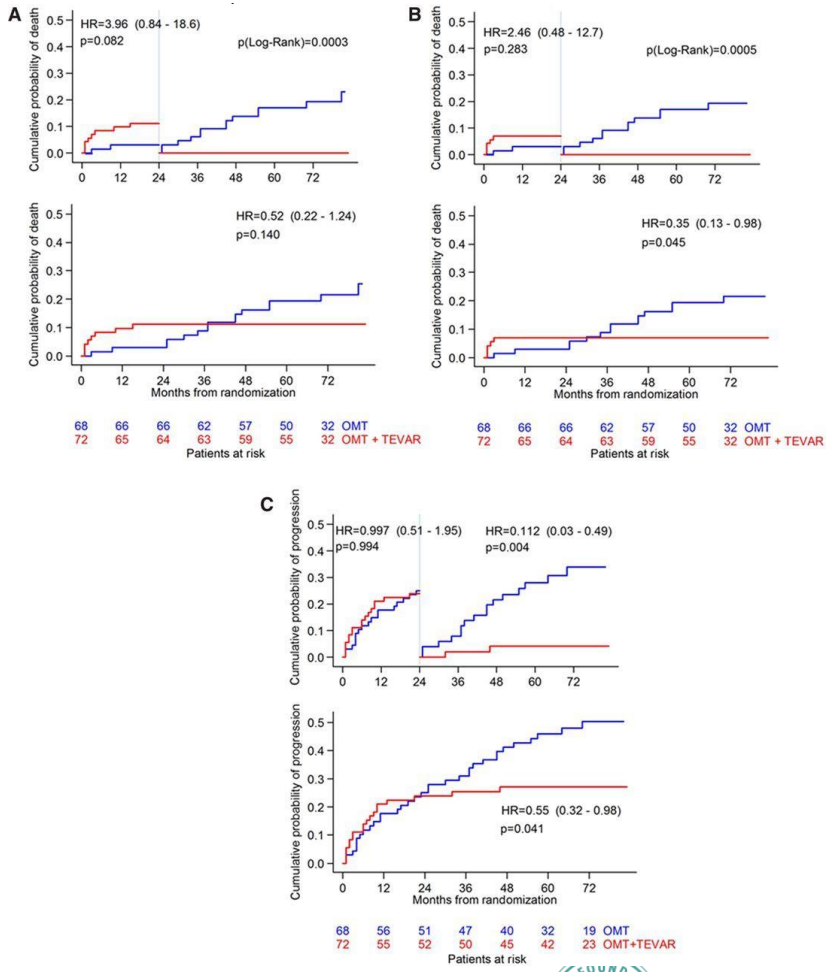
August 2013
Vol 6, Issue 4

Endovascular Repair of Type B Aortic Dissection

Long-term Results of the Randomized Investigation of Stent Grafts in Aortic Dissection Trial

Christoph A. Nienaber ✉, Stephan Kische, Hervé Rousseau, Holger Eggebrecht, Tim C. Rehders, Guenther Kundt, Aenne Glass, Dierk Scheinert, Martin Czerny, Tilo Kleinfeldt, Burkhart Zipfel, Louis Labrousse, Rossella Fattori and Hüseyin Ince
and for the INSTEAD-XL trial

- With longer-term follow-up of five years
- TEVAR/OMT was associated with improved aorta-specific survival and delayed disease progression



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Endovascular Repair of Acute Uncomplicated Aortic Type B Dissection Promotes Aortic Remodelling: 1 Year Results of the ADSORB Trial

J. Brunkwall [a,*], P. Kasprzak [b], E. Verhoeven [c], R. Heijmen [d], P. Taylor [d], the ADSORB Trialists [e]

[a] Department of Vascular and Endovascular Surgery, University Clinics, University of Cologne, Cologne, Germany
[b] Section of Vascular Surgery, Department of Surgery, University of Regensburg, Department of Vascular Surgery, Klinikum Nuernberg, Nuremberg, Germany
[c] Department of Cardiovasc Surgery Antonius Hospital, Nieuwegein, The Netherlands
[d] Department of Vascular Surgery, St Guys Hospital, London, UK

Remodeling with thrombosis of the false lumen and reduction of its diameter was induced by stent grafting

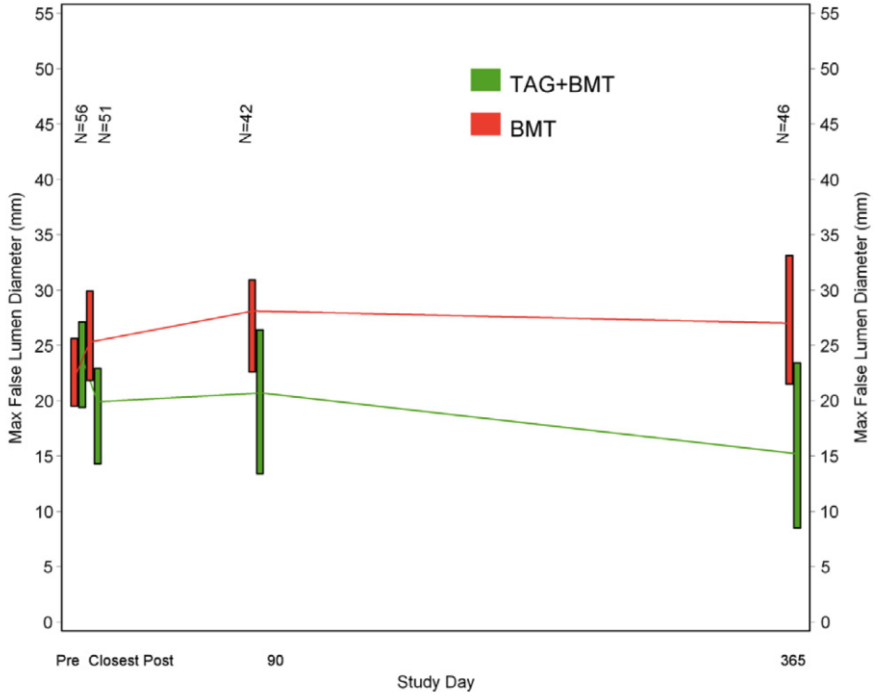

Figure 3. Evolution of the false lumen by treatment group during the one year follow up. At 1 year, the false lumen decreased in size in the TAG+BMT group but did not so in the BMT group ($p < .001$).

- OMT is the current standard of care
- Stable TBAD with suitable anatomy and high- risk features, preemptive TEVAR may be considered to improve late outcome

TABLE 1 Morphologic Features Posing High Risk of Late Sequelae

Primary entry tear at greater curve of distal arch
Short proximity of entry tear to left subclavian artery ostium
Initial aortic diameter ≥40 mm
Initial false lumen diameter ≥22 mm
Number/size of fenestrations between true and false lumen
Stent graft-induced new entry
Partial false lumen thrombosis

The Society of Thoracic Surgeons/American Association for Thoracic Surgery Clinical Practice Guidelines on the Management of Type B Aortic Dissection

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- **A stepwise approach to the evaluation and treatment of acute/subacute uncomplicated TBAD should be applied that includes identification of the primary entry tear site location, defining the proximity and distance of the dissection to the LSA, calibration of the maximum orthogonal aortic diameter, and confirmation of the lack of any organ malperfusion or other indications of complicated disease. (COR I, LOE B-NR)**
- **OMT is the recommended treatment for patients with uncomplicated TBAD. (COR I, LOE B-NR).**
- **Prophylactic TEVAR may be considered in patients with uncomplicated TBAD to reduce late aortic-related adverse events and aortic-related death. (COR IIB, LOE B-NR)**
- **Close clinical follow-up after hospital discharge is recommended for patients presenting with acute TBAD. (COR I, LOE B-NR)**

Chronic

- Indications for elective intervention in the chronic setting : Aneurysm

- Open surgical repair

- TEVAR…?

- TEVAR
- Changes in flap characteristics may adversely affect the ability to fully expand a stent graft and consequently the true lumen, leading to persistent false lumen flow and reduced capacity for aortic remodeling
- There are no published randomized trials of open surgery compared with TEVAR for chronic T

- **Open surgical repair should be considered for patients with chronic TBAD with indications for intervention, unless comorbidities are prohibitive or anatomy is not suitable for TEVAR. (COR IIA, LOE B-NR)**
- **TEVAR is reasonable for patients with chronic TBAD with an indication for intervention with suitable anatomy (adequate landing zone, absence of ascending or arch aneurysm) but who are at high risk for complications of open repair due to comorbidities. (COR IIA, LOE B-NR)**
- **TEVAR alone as sole therapy is not recommended in patients with chronic TBAD who have a large abdominal aortic aneurysm, an inadequate distal landing zone, and/or large distal reentry tears. (COR III: No benefit, LOE C-LD)**

Aortic septotomy to optimize landing zones during thoracic endovascular aortic repair for chronic type B aortic dissection

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Bo Yang, MD, PhD,[a] Himanshu J. Patel, MD,[a] and Karen M. Kim, MD, MSc[a]

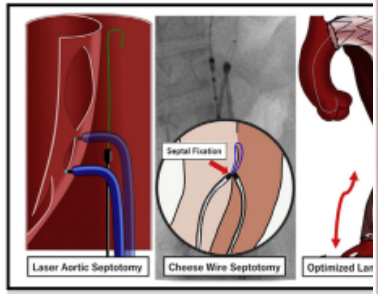
ABSTRACT

Objective: The role of thoracic endovascular aortic repair for chronic type B aortic dissection remains controversial. Clinical outcomes of thoracic endovascular aortic repair with recently implemented aortic septotomy strategy were compared with stand-alone thoracic endovascular aortic repair.

Methods: Between 2008 and 2020, 88 patients with chronic type B aortic dissection and degenerative aortic aneurysm underwent a thoracic endovascular aortic repair with or without adjunctive aortic septotomy, consisting of 36 (41%) with de novo chronic type B aortic dissection and 52 (59%) with residual chronic type B aortic dissection after type A aortic dissection repair.

Results: Aortic septotomy was performed in 31 patients (35%) to optimize the proximal (3/31;10%) and distal (31/31;100%) landing zones. The aortic septotomy techniques comprised laser aortic septotomy in 16 patients (52%) and cheese wire septotomy in 15 patients (48%) with a 97% overall technical success rate. The median time interval between aortic dissection occurrence and thoracic endovascular aortic repair was 1.2 years. During follow-up, there were 12 (21%) sudden deaths and 17 (30%) combined aorta-related and sudden deaths in the nonaortic septotomy group, whereas there were no deaths in the septotomy group ($P < .001$). Patients without aortic septotomy required aortic reinterventions more frequently than those with aortic septotomy (30% vs 7%; $P = .014$), and 77% of these procedures were related to residual retrograde false lumen flow. Positive aortic remodeling was confirmed in 90% and 37% in the aortic septotomy and nonseptotomy groups, respectively ($P < .001$).

Conclusions: Stand-alone thoracic endovascular aortic repair outcomes without adjunctive procedures for chronic type B aortic dissection remain unfavorable. In contrast, landing zone optimization using aortic septotomy resulted in a remarkably higher positive aortic remodeling rate. Routine aortic septotomy strategy may positively affect long-term chronic type B aortic dissection survival and expand thoracic endovascular aortic repair candidacy. (J Thorac Cardiovasc Surg 2023;165:1776-86)



Aortic septotomy and optimization of landin
for cTBAD.

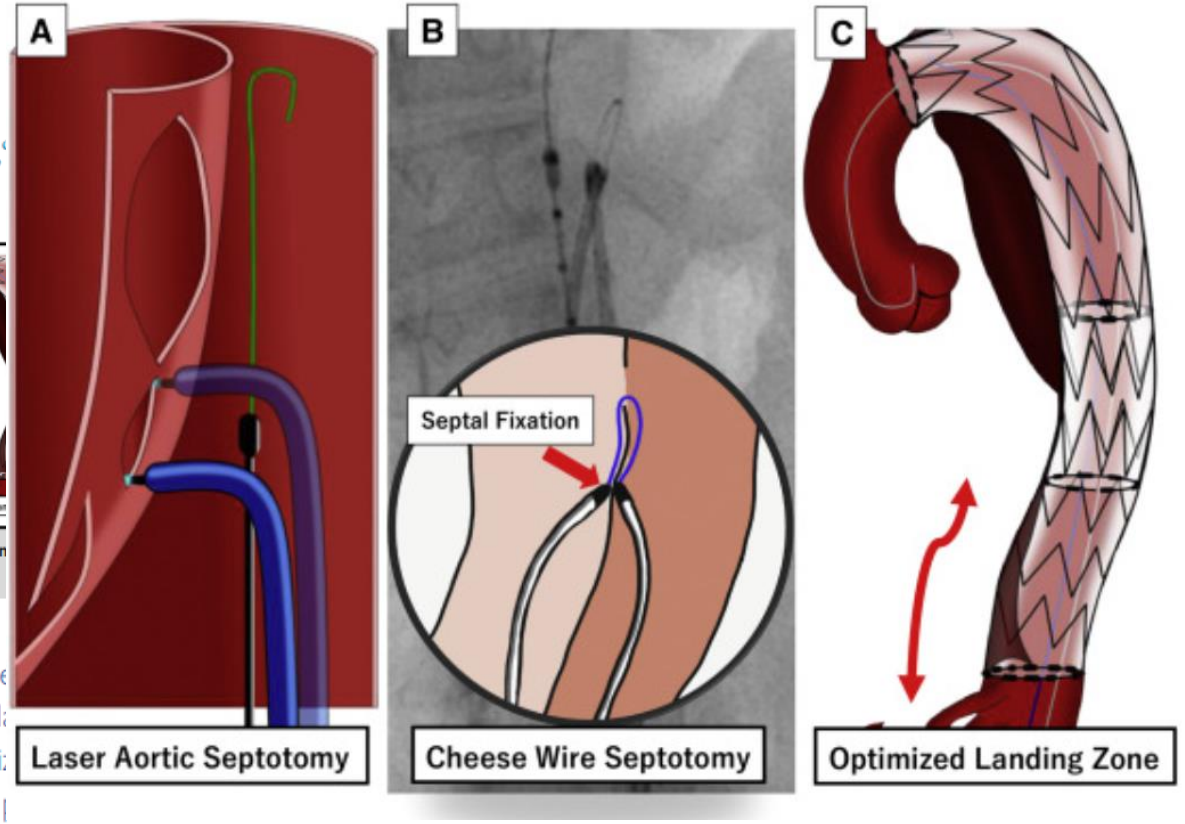
CENTRAL MESSAGE

Aortic septotomy is a simple technique using readily avail off-the-shelf tools to optimi landing zones and enhance itive aortic remodeling after TE-VAR for cTBAD.

PERSPECTIVE

TEVAR for cTBAD remains controversial because of the presence of a thick aortic septum and inability to eliminate persistent false lumen flow. Aortic septotomy is a simple and reproducible technique using readily available off-the-shelf tools to optimize landing zones and enhance positive aortic remodeling after TEVAR for a wide spectrum of chronic aortic dissection pathologies.

See Commentaries on pages 1787 and 1788.



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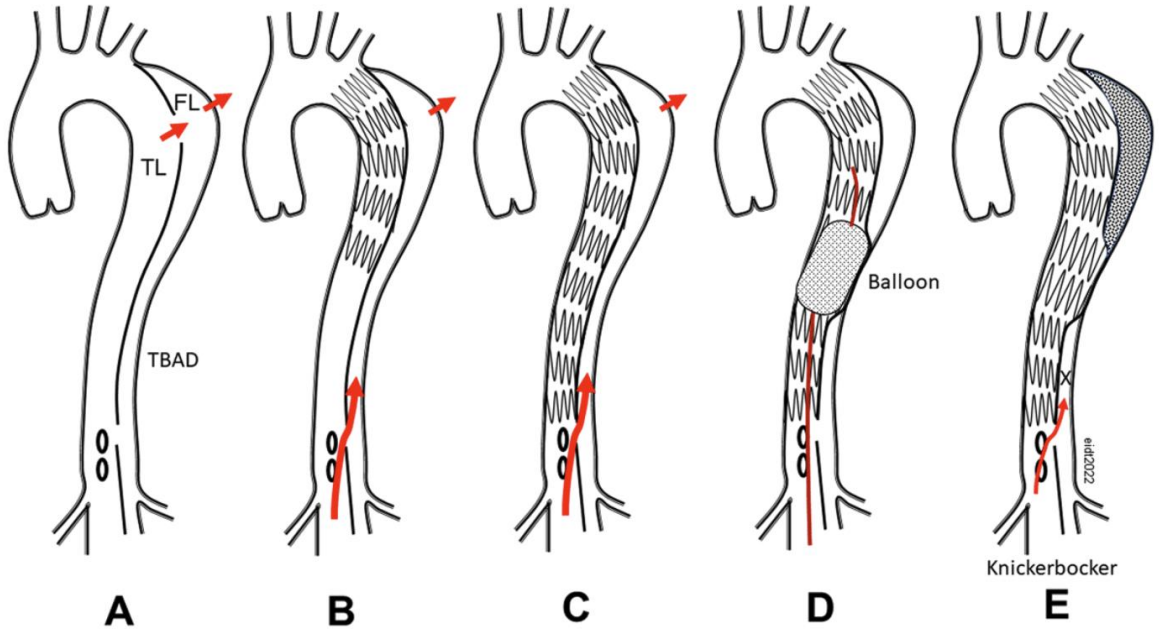
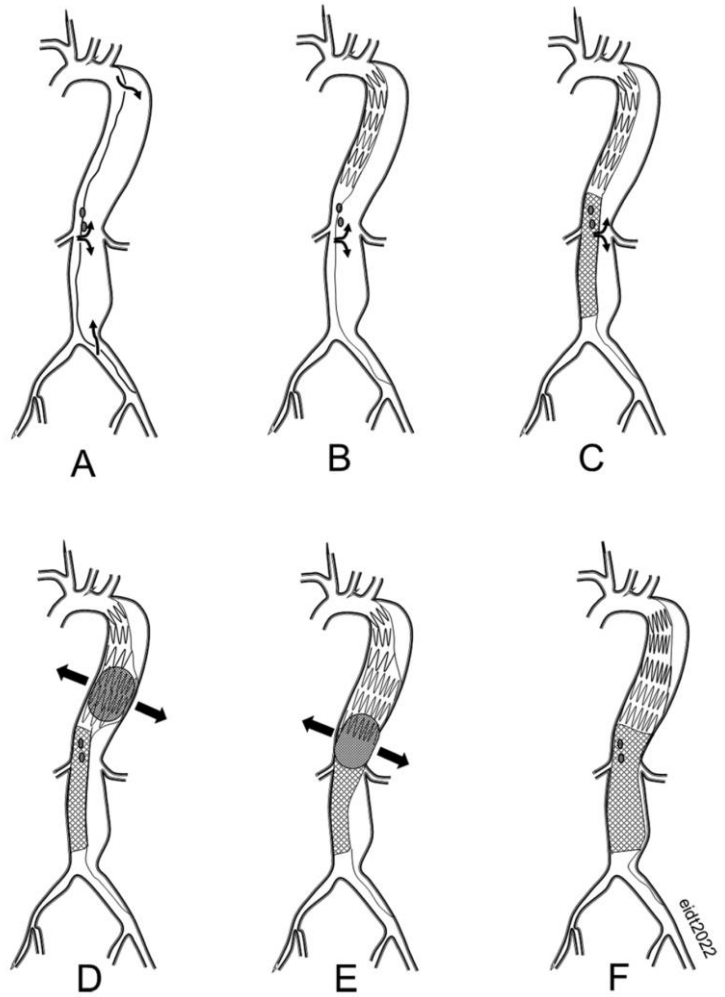
The “knickerbocker” technique



provisional extension to induce complete attachment after stent-graft placement in type B aortic dissection” (PETTICOAT)



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Outcomes of Stentless Thoracic Endovascular Aortic Repair for Chronic DeBakey IIIb Aneurysms

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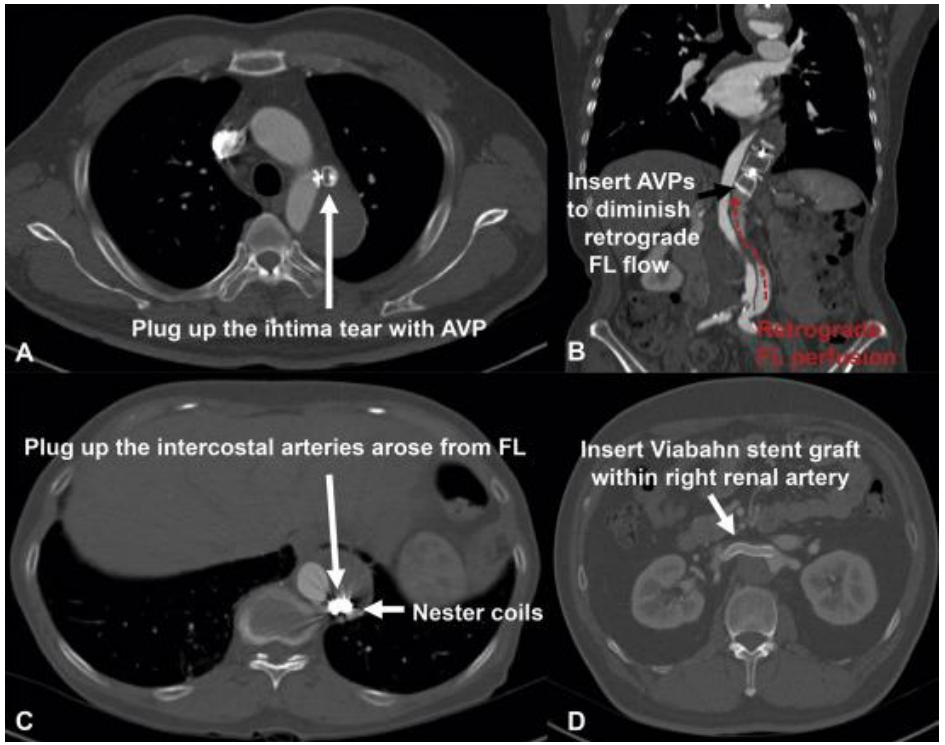
Background. We introduce a new endovascular procedure for favorable aortic remodeling in patients with chronic DeBakey IIIb (CDIIIb) aneurysms and present outcomes.

Methods. This study included 19 patients who underwent stentless thoracic endovascular aortic repair (TEVAR) for CDIIIb aneurysms between 2014 and 2016. Stentless TEVAR is defined as an endovascular procedure involving closure of communicating channels or obliteration of the false lumen itself using various materials. Thoracic false lumen thrombosis was defined as there was no flow in the false lumen of the thoracic aorta. Aortic diameter was measured at 3 levels (left subclavian artery, pulmonary artery bifurcation, and celiac axis).

Results. Fifteen of 19 (78.9%) patients demonstrated thoracic false lumen thrombosis. There was no mortality, and the mean follow-up duration was 16.8 months. False and true lumen diameters at the left subclavian and pulmonary artery levels significantly changed after the procedure (false lumen: 22.6 ± 16.6 versus 16.1 ± 14.4 mm, 23.2 ± 14.6 versus 18.0 ± 13.2 mm, $p = 0.001$ and $p = 0.002$, respectively; true lumen: 22.7 ± 8.7 versus 27.9 ± 6.3 mm, 19.0 ± 8.3 versus 24.3 ± 6.7 mm, $p = 0.001$ and $p = 0.001$, respectively). The number of visceral stent grafts and preoperative true lumen diameter at the pulmonary artery were independent predictors for thoracic false lumen thrombosis (hazard ratio, 3.445, 95% confidence interval, 1.494 to 7.946; $p = 0.004$; and hazard ratio, 1.106; 95% confidence interval, 1.029 to 1.189; $p = 0.006$, respectively).

Conclusions. Stentless TEVAR seems to be a safe procedure and enables favorable aortic remodeling. Thus, this technique can be useful in a selected group of patients with CDIIIb aneurysms.

(Ann Thorac Surg 2018;106:1308–15)



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CONNECTIVE TISSUE DISORDERS

- **Open surgical repair over TEVAR is reasonable for more durable treatment in patients with connective tissue disorders and TBAD who have progression of disease despite OMT. (COR I, LOE B-NR)**
- **TEVAR is reasonable in patients with connective tissue disorders with acute complicated TBADs and anatomy favorable for TEVAR as a bridge to delayed open reconstruction. (COR IIA, LOE C-LD)**

Conclusion

- Medical therapy
- Open surgery
- Endovascular intervention

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