THE 24TH INTERNATIONAL EXPERTS SYMPOSIUM
CRITICAL ISSUES
IN AORTIC ENDOGRAFTING
DECEMBER 17 & 18 2021
PULLMAN PARIS BERCY PARIS - FRANCE

Acute type B dissection

When do we intervene - 14 days? 3 months?

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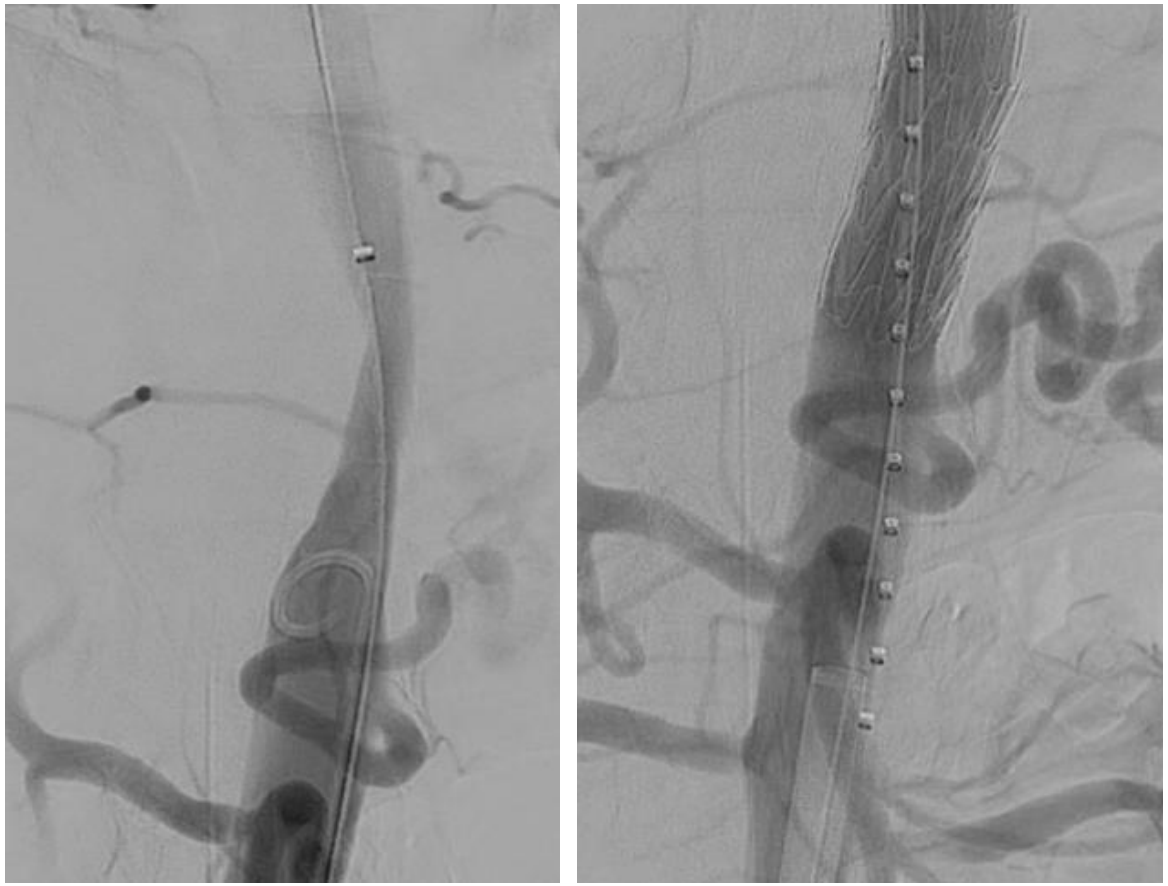
The rational of Intervention for acute TBAD

1. Cover the proximal entry tear
2. Redirect aortic flow toward the True L

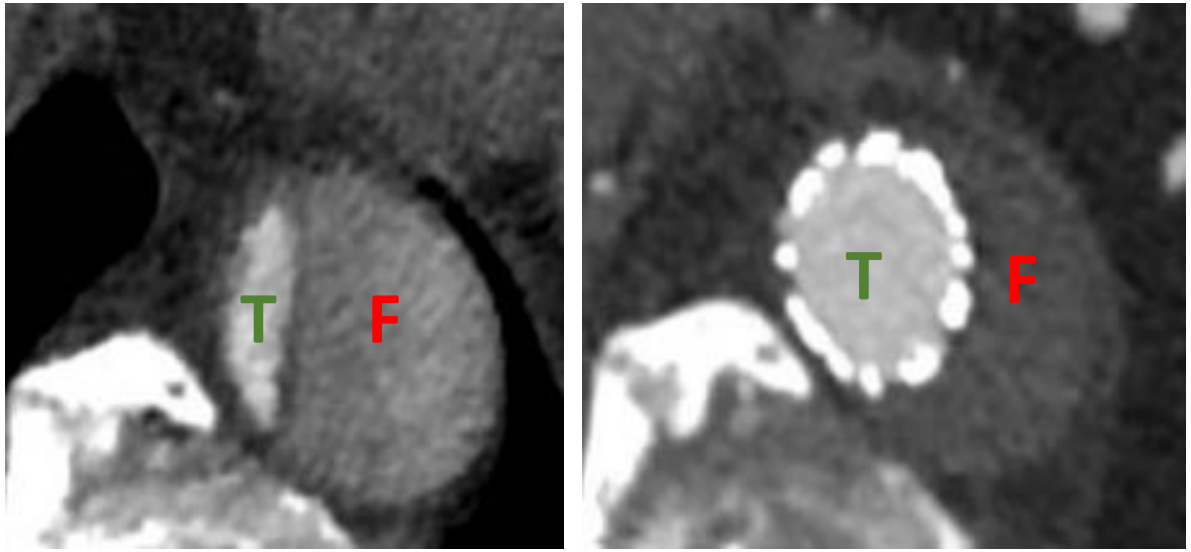
The rational of Intervention for acute TBAD

1. Cover the proximal entry tear
2. Redirect aortic flow toward the True L
3. Reduce blood pressure / perfusion within the False L



The rational of Intervention for acute TBAD

1. Cover the proximal entry tear
2. Redirect aortic flow toward the True L
3. Reduce blood pressure / perfusion within the False L
4. False L thrombosis, aortic remodeling, aortic wall stabilization



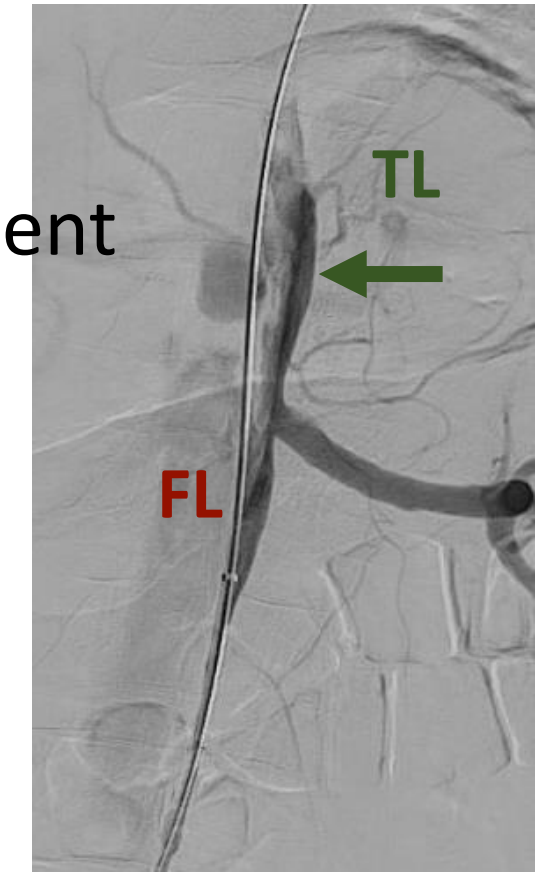
Clinical presentation - implication for pts management & outcomes

✓ Complicated

Rupture , malperfusion, stroke/SCI, rapid enlargement

✓ Uncomplicated

No evidence of rupture or end-organ malperfusion



SVS / STS reporting standard, March 2020

Clinical presentation - implication for pts management & outcomes

✓ @ High-risk of subsequent complications

1. Refractory pain or hypertension (> 12 h) / readmission
2. Aortic diameter > 40 mm
3. Primary entry tear > 1 cm
4. Entry tear location in the inner curve (vs outer curve)
5. False lumen diameter > 22 mm
6. Certain radiographic findings of bloody effusion
7. Radiographic but not clinically apparent malperfusion

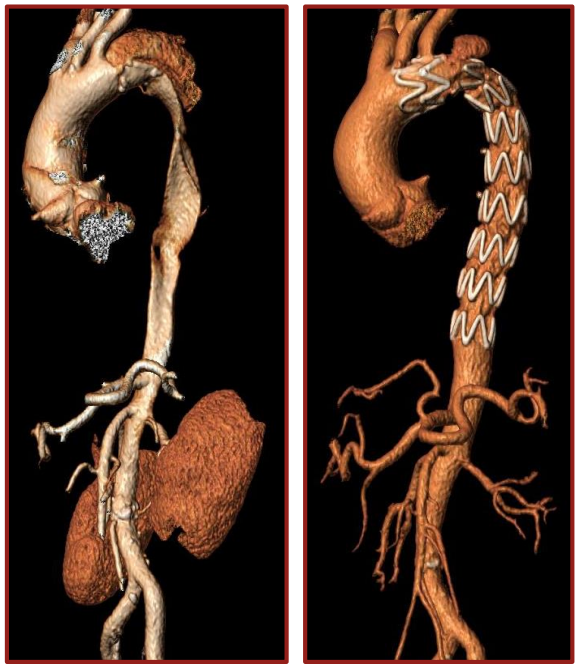
SVS / STS reporting standard, March 2020

Chronicity classification - implication for pts management & outcomes

	Time from onset of symptoms
Hyperacute	< 24 hours
Acute	1 - 14 days
Subacute	15 - 90 days
Chronic	> 90 days

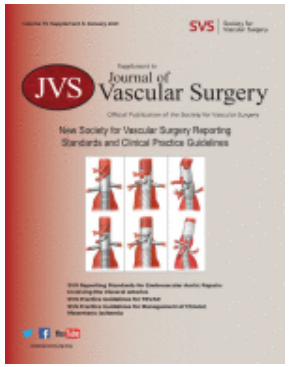
SVS / STS reporting standard, March 2020

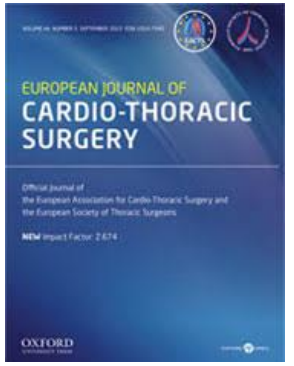
When do we intervene ?



International guidelines / reporting standard

- ✓ ESVS 2017 *Riambau et al, EJVS 2017*
- ✓ SVS / STS 2020 *Lombardi et al, JVS 2020*
- ✓ ESC / EIPA / EACTS 2020 *Czerny et al, EJCTS 2020*



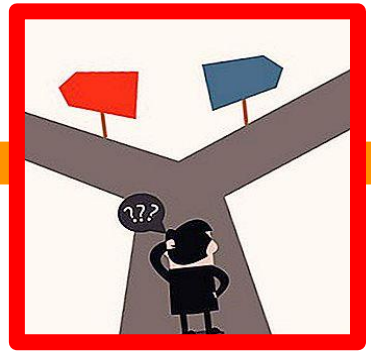


When do we intervene ?

Symptoms onset

Complicated TBAD
Class I - Level C

Uncomplicated TBAD - selectively considered to prevent aortic complication
Class I - Level C



0 days

14 days

3 months

Riambau, EJVS 2017

Editor's Choice — Management of Descending Thoracic Aorta Diseases

Clinical Practice Guidelines of the European Society for Vascular Surgery (ESVS)

Recommendation 16	Class	Level of evidence
In patients with complicated acute type B aortic dissection, endovascular repair with thoracic endografting should be the first line intervention	I	C
Recommendation 17		
In complicated acute type B aortic dissection, endovascular fenestration should be considered to treat malperfusion	IIa	C
Recommendation 18		
To prevent aortic complications in uncomplicated acute type B aortic dissection, early thoracic endografting may be considered selectively	IIb	B

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Recommendation 18		
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Riambau, EJVS 2017

Surgical Decision Making in Uncomplicated Type B Aortic Dissection: A Survey of Australian/New Zealand and European Surgeons

Bijit Munshi [a,b,f,*], Barry J. Doyle [a,c,d,e], Jens C. Ritter [f], Shirley Jansen [b,g,h,i], Louis P. Parker [a,c], Vincent Riambau [j], Colin Bicknell [k,l], Paul E. Norman [a,b,f], Anders Wanhainen [m]

- ✓ Online Survey **2018**
- ✓ Pre-emptive TEVAR in UTBAD **43**% of Surgeons

Munshi, EJVS 2020

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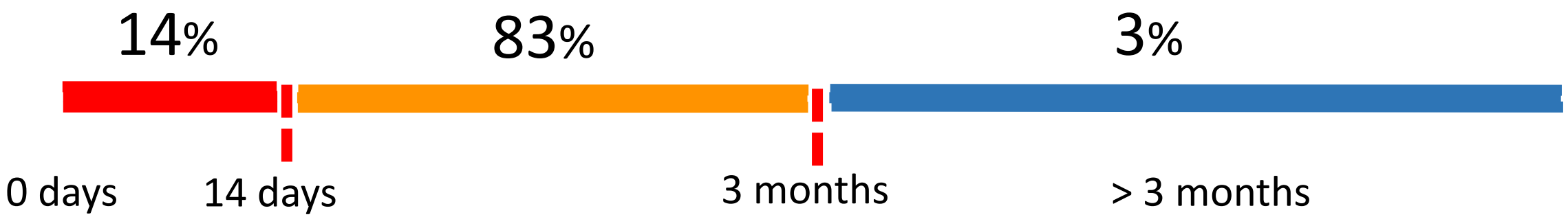


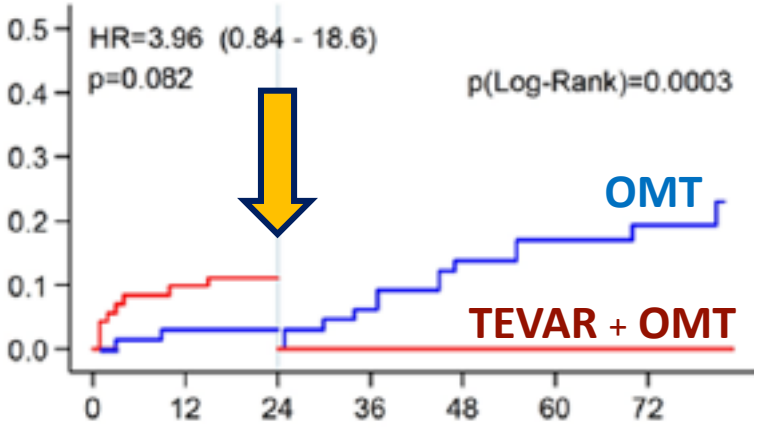
Munshi, EJVS 2020

Endovascular Repair of Type B Aortic Dissection
Long-term Results of the Randomized Investigation of Stent Grafts in Aortic Dissection Trial

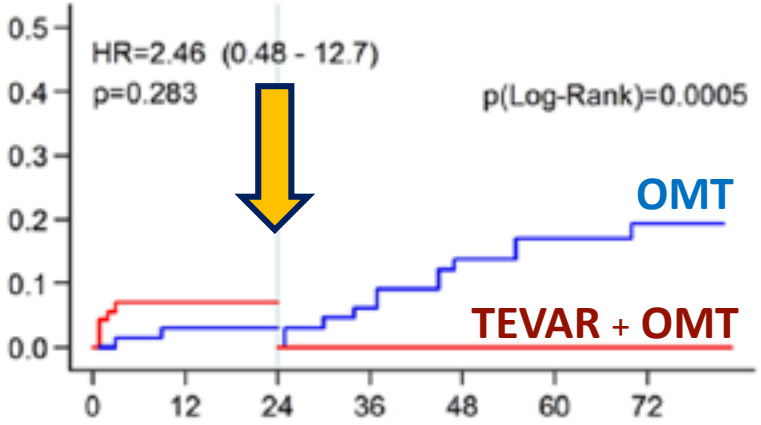
Christoph A. Nienaber, MD, PhD; Stephan Kische, MD; Hervé Rousseau, MD, PhD; Holger Eggebrecht, MD; Tim C. Rehders, MD; Guenther Kundt, MD, PhD; Aenne Glass, MA; Dierk Scheinert, MD, PhD; Martin Czerny, MD, PhD; Tilo Kleinfeldt, MD; Burkhart Zipfel, MD; Louis Labrousse, MD; Rossella Fattori, MD, PhD;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

TEVAR for uncomplicated TBAD

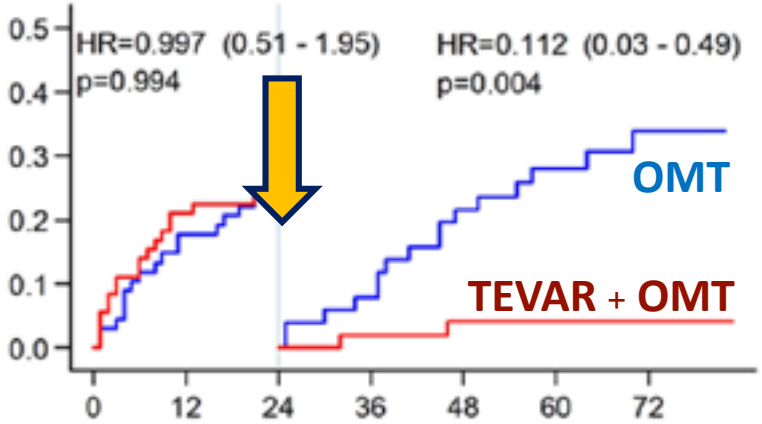
Overall mortality



Aortic mortality



Adverse events



In stable type B dissection with suitable anatomy

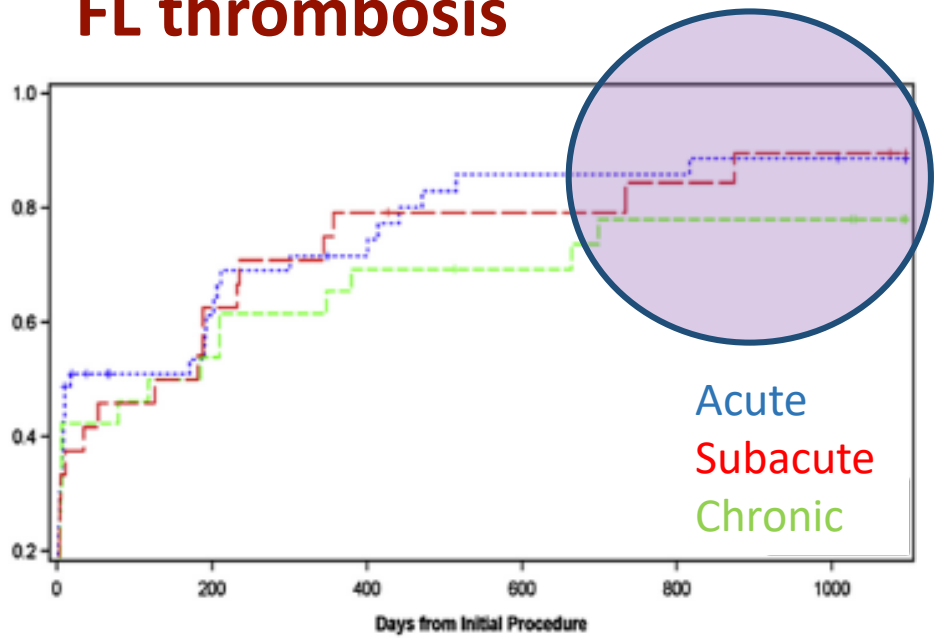
Pre-emptive TEVAR should be considered to improve late outcomes

Circ Cardiovasc Interv. 2013

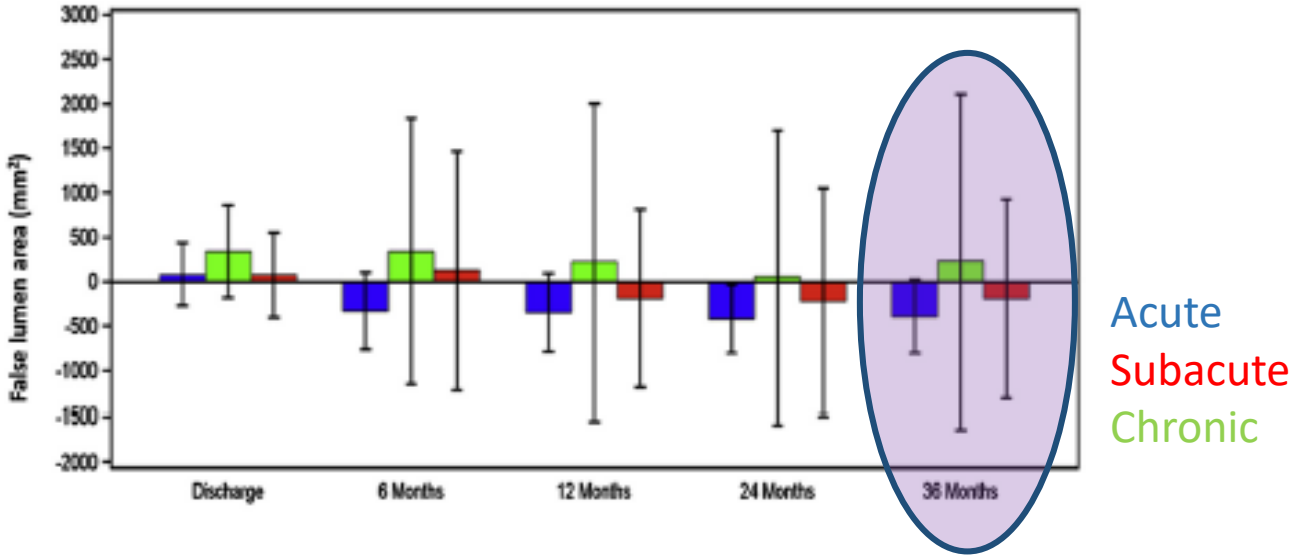
Mid-term Outcomes and Aortic Remodelling After Thoracic Endovascular Repair for Acute, Subacute, and Chronic Aortic Dissection: The VIRTUE Registry

The VIRTUE Registry Investigators *

FL thrombosis



Change in FL area



The VIRTUE Registry Investigators, EJVS 2014

Mid-term Outcomes and Aortic Remodelling After Thoracic Endovascular Repair for Acute, Subacute, and Chronic Aortic Dissection: The VIRTUE Registry

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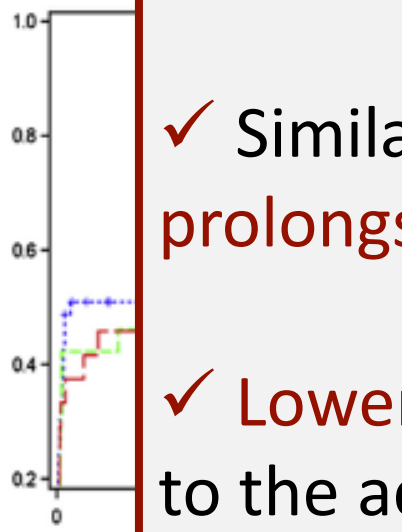

✓ Subacute TBAD
similar aortic remodeling to patients with acute TBAD

✓ Similar aortic plasticity
prolongs the therapeutic window for the treatment of UTBAD

✓ Lower risk of damage
to the acutely vulnerable/fragile/inflamed aorta by stentgraft

Acute
Subacute
Chronic

The VIRTUE Registry Investigators, EJVS 2014

TEVAR complications in TBAD

	Acute TBAD %	Non acute TBAD %
Retrograde type A dissection	0.5 - 1.6	0 - 1.5
Stroke	0.5 - 6.0	0 - 1.5
SCI	0 - 3.4	2.9 - 4.5
30-day mortality	0.5 - 7.1	0 - 4.5

Trados, JACC 2019
Xie, EJVS 2021

EDITORIAL

Looking for the Holy Grail in Acute/Subacute Type B Dissection

To prevent further aortic complications (50% of cases)

✓ *'(Over)treatment'* of these patients by TEVAR may only mean operative risk without later benefit

✓ Appropriate selection of cases / timing

Verhoeven, EJVS 2019

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PubMed.gov

Timing of TEVAR in uncomplicated type B dissection Search

Advanced

2021

Aorta and Major Branches

Eur J Vasc Endovasc Surg (2021) 61, 788–797

Timing and Outcome of Endovascular Repair for Uncomplicated Type B Aortic Dissection

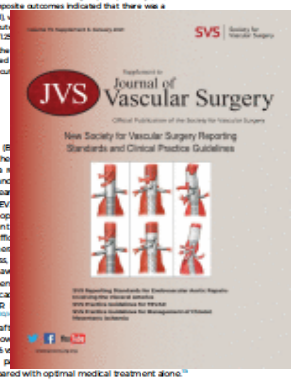
267 cases

WHAT THIS PAPER ADDS

Thoracic endovascular aortic repair (TEVAR) can be used in uncomplicated type B aortic dissection (uTBAD) to improve long term outcomes, but the impact of intervention timing remains unclear. The present study found no significant difference in early or late outcomes between acute (1–14 days) and subacute (15–90 days) groups. Although not statistically significant, 30 day mortality in the acute group was five times higher, and aortic rupture, retrograde type A dissection, and disabling stroke were observed only in the acute group. These results suggest caution in endovascular repair for uTBAD patients in the acute phase.

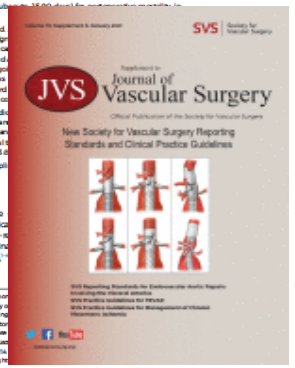
Timing of endovascular repair impacts long-term outcomes of uncomplicated acute type B aortic dissection

238 cases



Timing of thoracic endovascular aortic repair for uncomplicated acute type B aortic dissection and the association with complications

687 cases



Vascular Surgery - University of Bologna

Timing and Outcome of Endovascular Repair for Uncomplicated Type B Aortic Dissection

Enmin Xie [a,b,‡], Fan Yang [c,‡], Yuan Liu [a], Ling Xue [a], Ruixin Fan [d], Nianjin Xie [a], Lyufan Chen [a], Jitao Liu [a], Jianfang Luo [a,b,*]

	@ 30-day	Acute TBAD %	Subacute TBAD %	p
✓	Death	3.8	0.7	.11
✓	Aortic rupture	1.5	0	.24
✓	Retrograde type A dissection	0.8	0	.49
✓	Disabling stroke	0.8	0	.49
	Minor stroke	1.5	0.7	.61
	SCI	0.8	2.2	.62
	Reinterventions	0.8	0.7	1.0

→ x 5

Xie, EJVS 2021

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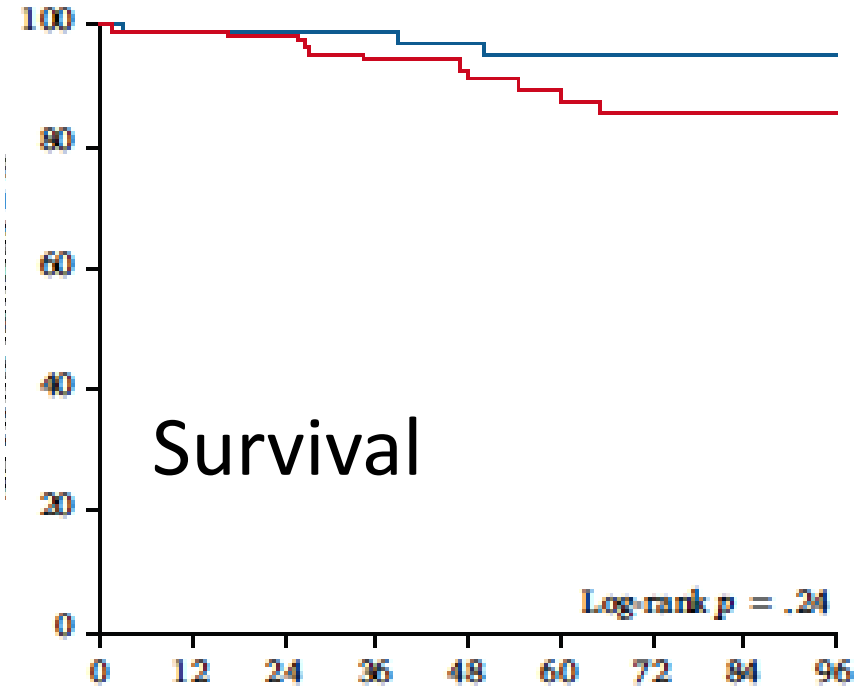

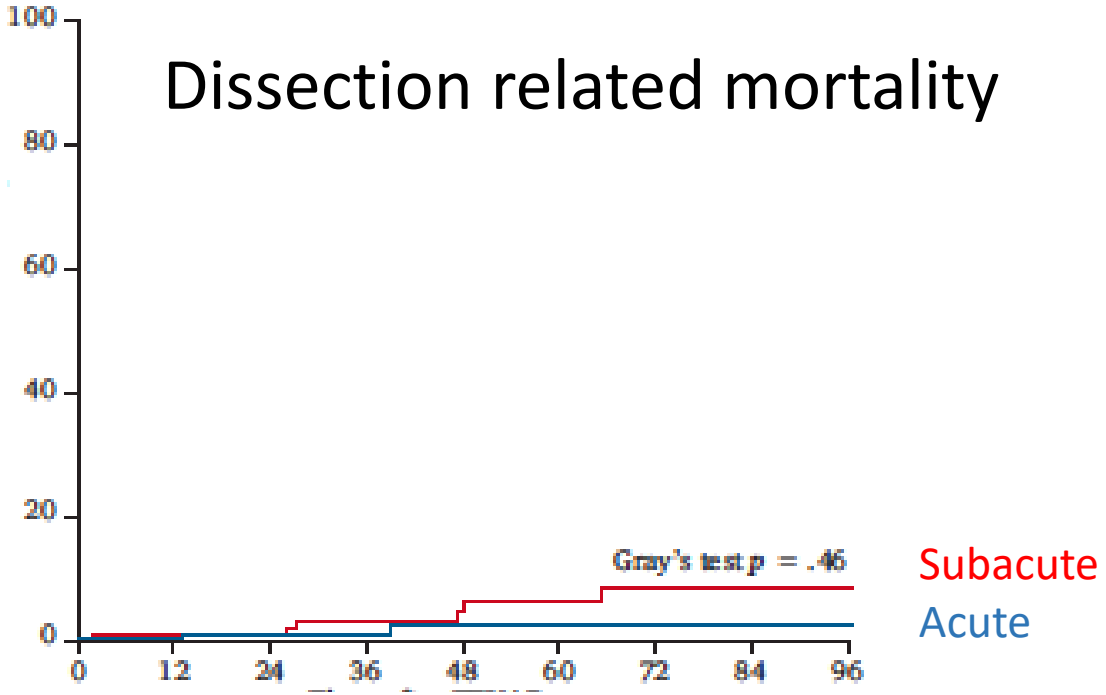

Xie, EJVS 2021

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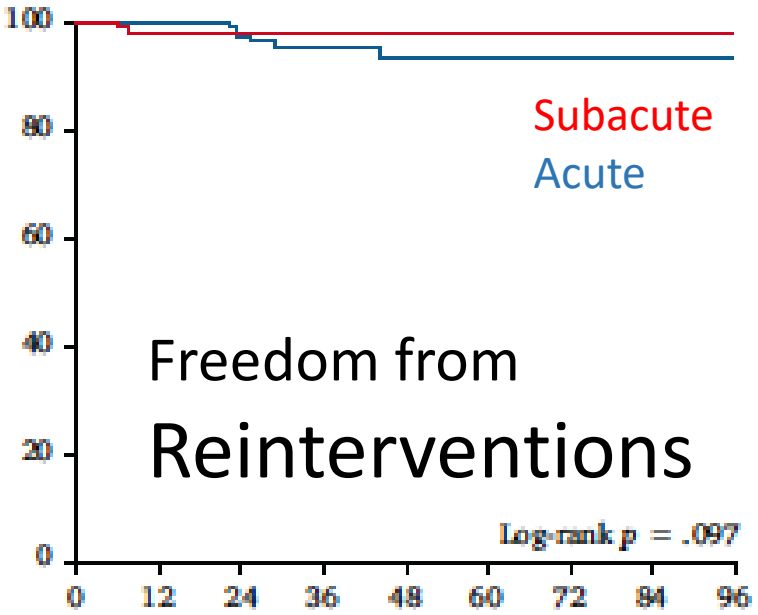
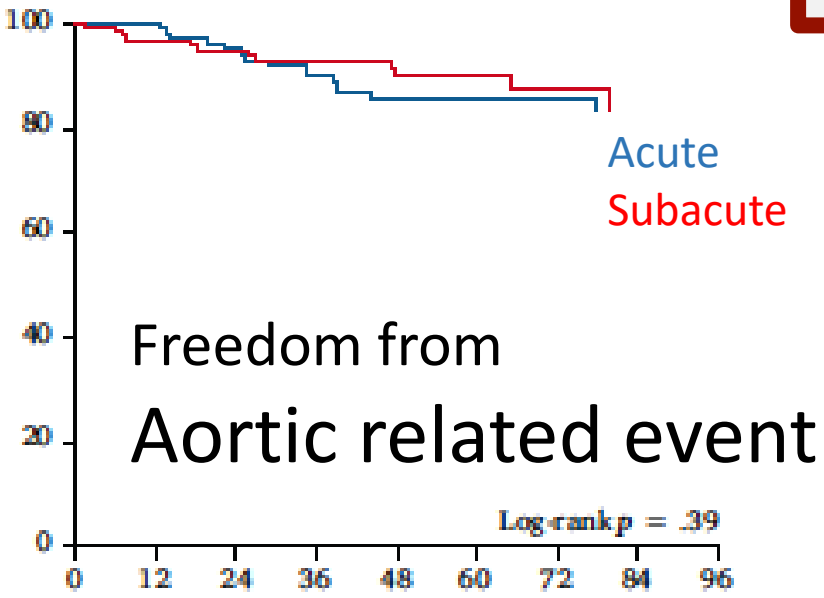




Aortic Remodeling

	Acute intervention (n = 120)	Subacute intervention (n = 133)	p value
Thoracic aorta			
Maximum diameter of aorta – mm	36.4 ± 8.6	37.8 ± 8.0	.31
False lumen status			.79
Partially thrombosed	10 (9.3)	12 (10.4)	
Completely thrombosed	97 (90.7)	103 (89.6)	
Abdominal aorta			
Maximum aortic diameter – mm	32.7 ± 8.3	34.1 ± 7.9	.19
False lumen status			.61
Patent	22 (20.6)	21 (18.3)	
Partially thrombosed	35 (32.7)	47 (40.9)	
Completely thrombosed	30 (28.0)	26 (22.6)	
Normal	20 (18.7)	21 (18.3)	

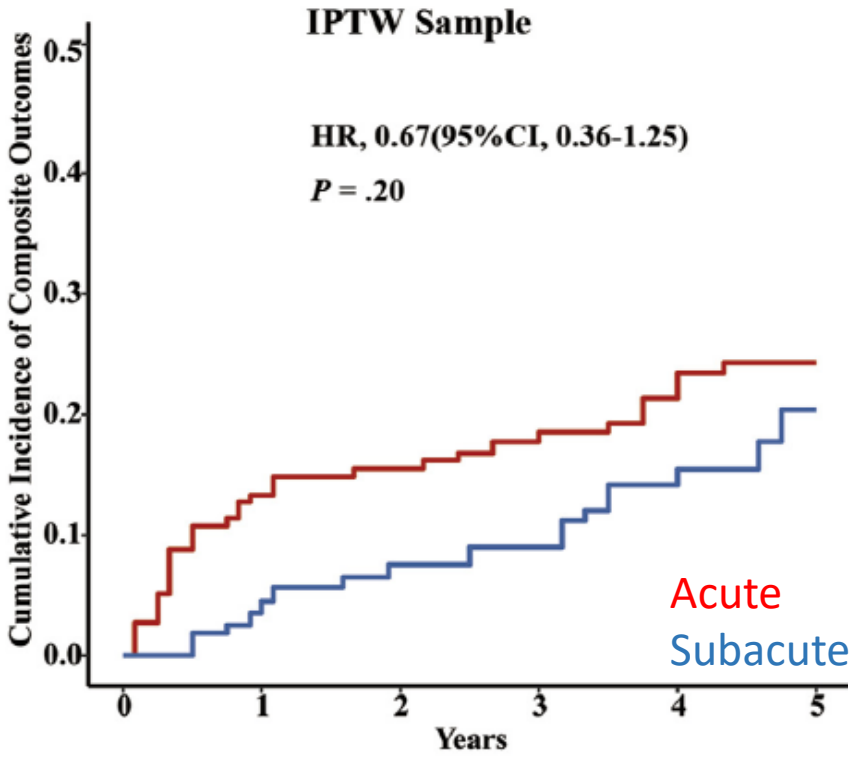
Xie, EJVS 2021

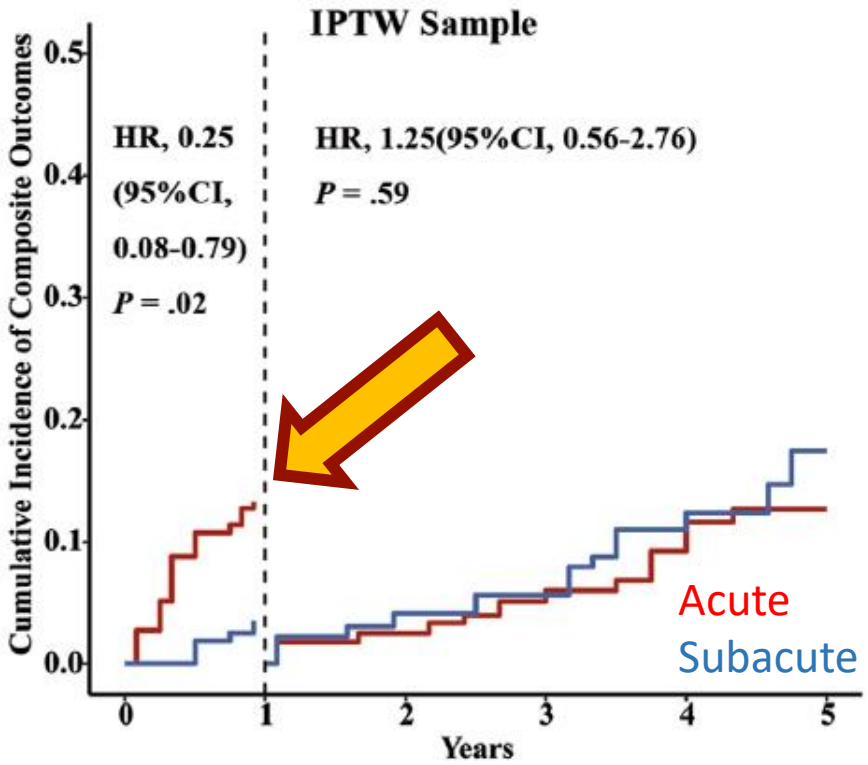
Timing of endovascular repair impacts long-term outcomes of uncomplicated acute type B aortic dissection

Dongqiao Xiang, MD,[a,b] Feihong Wu, MD,[a,b] Lei Chen, MD,[a,b] Huimin Liang, PhD,[a,b] Bin Xiong, PhD,[a,b] Bin Liang, PhD,[a,b] Fan Yang, PhD,[a,b] *and* Chuansheng Zheng, PhD,[a,b] *Wuhan, China*

@ 1-year
Composite Endpoints

- ✓ Death
- ✓ Rupture
- ✓ RTA dissection
- ✓ New dissection
- ✓ Endoleak
- ✓ Late reinterventions





Xiang, JVS 2021

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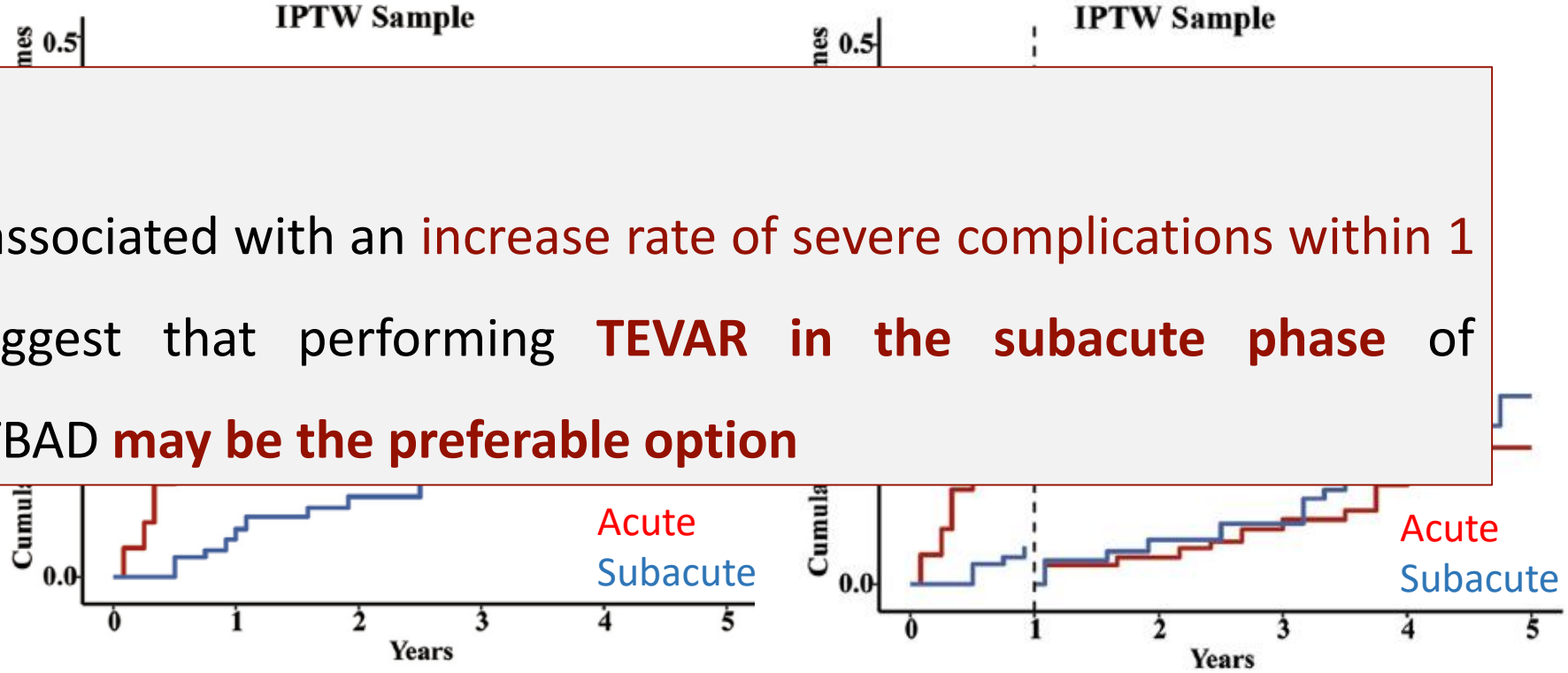
@ 1-

Com

- ✓ De
- ✓ Ru
- ✓ RTA
- ✓ Ne
- ✓ En
- ✓ Late reinterventions

Conclusion

Acute TEVAR is associated with an increase rate of severe complications within 1 year, which suggest that performing **TEVAR in the subacute phase** of uncomplicated TBAD **may be the preferable option**



Xiang, JVS 2021

Timing of thoracic endovascular aortic repair for uncomplicated acute type B aortic dissection and the association with complications

Daniel J. Torrent, MD, MPH,[a] Graeme E. McFarland, MD,[a] Grace Wang, MD, MSCE,[b] Mahmoud Malas, MD, MHS,[c] Benjamin J. Pearce, MD,[a] Victoria Aucoin, MD,[a] Dan Neal, MS,[d] Emily L. Spangler, MD,[a] Zdenek Novak, MD, PhD,[a] Salvatore T. Scali, MD,[d] *and* Adam W. Beck, MD,[a]
Birmingham, Ala; Philadelphia, Pa; San Diego, Calif; and Gainesville, Fla

VQI TEVAR Registry

	Acute TBAD %	Subacute TBAD %	p
Mortality @ 30-day	5.4	3.5	.40
Reinterventions @ 30-day	15.3	5.2	.02
Mortality @ 1-year	12.4	9.9	.50
Reinterventions@ 1-year	33.8	14.5	.007
Any complication	24.1	17.6	.10

Torrent, JVS 2021

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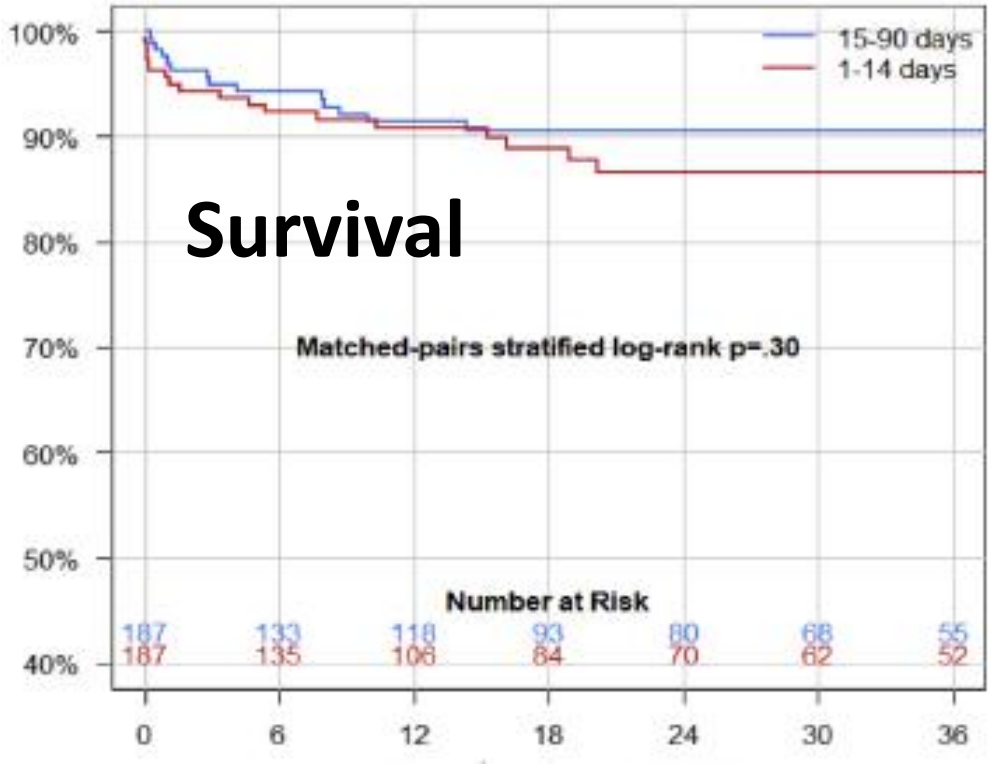

Outcome	OR or HR (95% CI)	*P* value
Long-term survival	HR = 1.4 (0.780-2.34)	.282
Any complication	OR = 1.5 (0.882-2.44)	.140
In-hospital reintervention	OR = 2.3 (0.909-5.71)	.080
Long-term reintervention	HR = 1.5 (0.915-2.51)	.106

CI, Confidence interval; *HR*, hazard ratio; *OR*, odds ratio.

Torrent, JVS 2021

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ESVS 2021

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JVS 2021

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JVS 2021

Randomized Trials

to evaluate
the role of optimal TEVAR timing

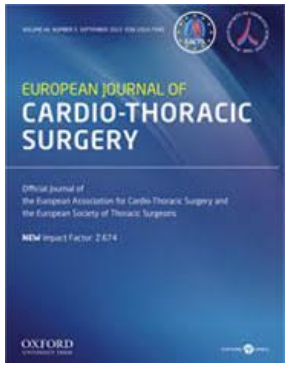
European Journal of Cardio-Thoracic Surgery 59 (2021) 65–73
doi:10.1093/ejcts/ezaa268 Advance Access publication 4 October 2020

POSITION STATEMENT

Cite this article as: Czerny M, Pacini D, Aboyans V, Al-Attar N, Eggebrecht H, Evangelista A *et al.* Current options and recommendations for the use of thoracic endovascular aortic repair in acute and chronic thoracic aortic disease: an expert consensus document of the European Society for Cardiology (ESC) Working Group of Cardiovascular Surgery, the ESC Working Group on Aorta and Peripheral Vascular Diseases, the European Association of Percutaneous Cardiovascular Interventions (EAPCI) of the ESC and the European Association for Cardio-Thoracic Surgery (EACTS). Eur J Cardiothorac Surg 2021;59:65–73.

Current options and recommendations for the use of thoracic endovascular aortic repair in acute and chronic thoracic aortic disease: an expert consensus document of the European Society for Cardiology (ESC) Working Group of Cardiovascular Surgery, the ESC Working Group on Aorta and Peripheral Vascular Diseases, the European Association of Percutaneous Cardiovascular Interventions (EAPCI) of the ESC and the European Association for Cardio-Thoracic Surgery (EACTS)

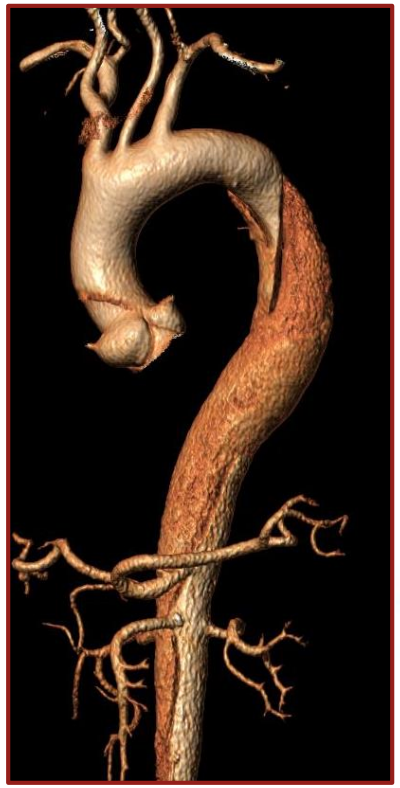
POSITION STATEMENT

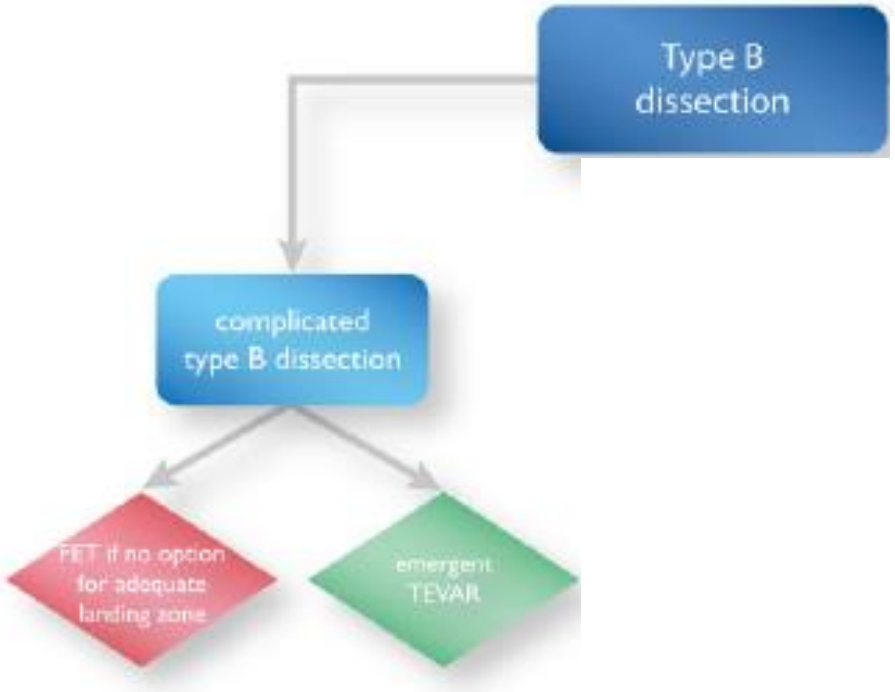


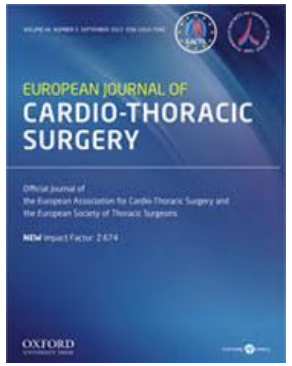
- ✓ TEVAR in acute complicated type B dissection
- ✓ TEVAR in high risk uncomplicated type B dissection

Primary entry tear at inner curvature
Primary entry tear > 10 mm
False lumen diameter ≥ 25 mm
Aortic diameter > 40 mm

Czerny, EJCTS 2020







1-14 days

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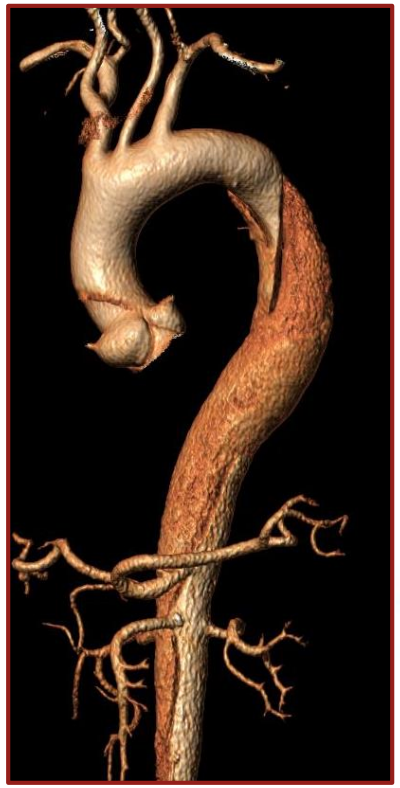
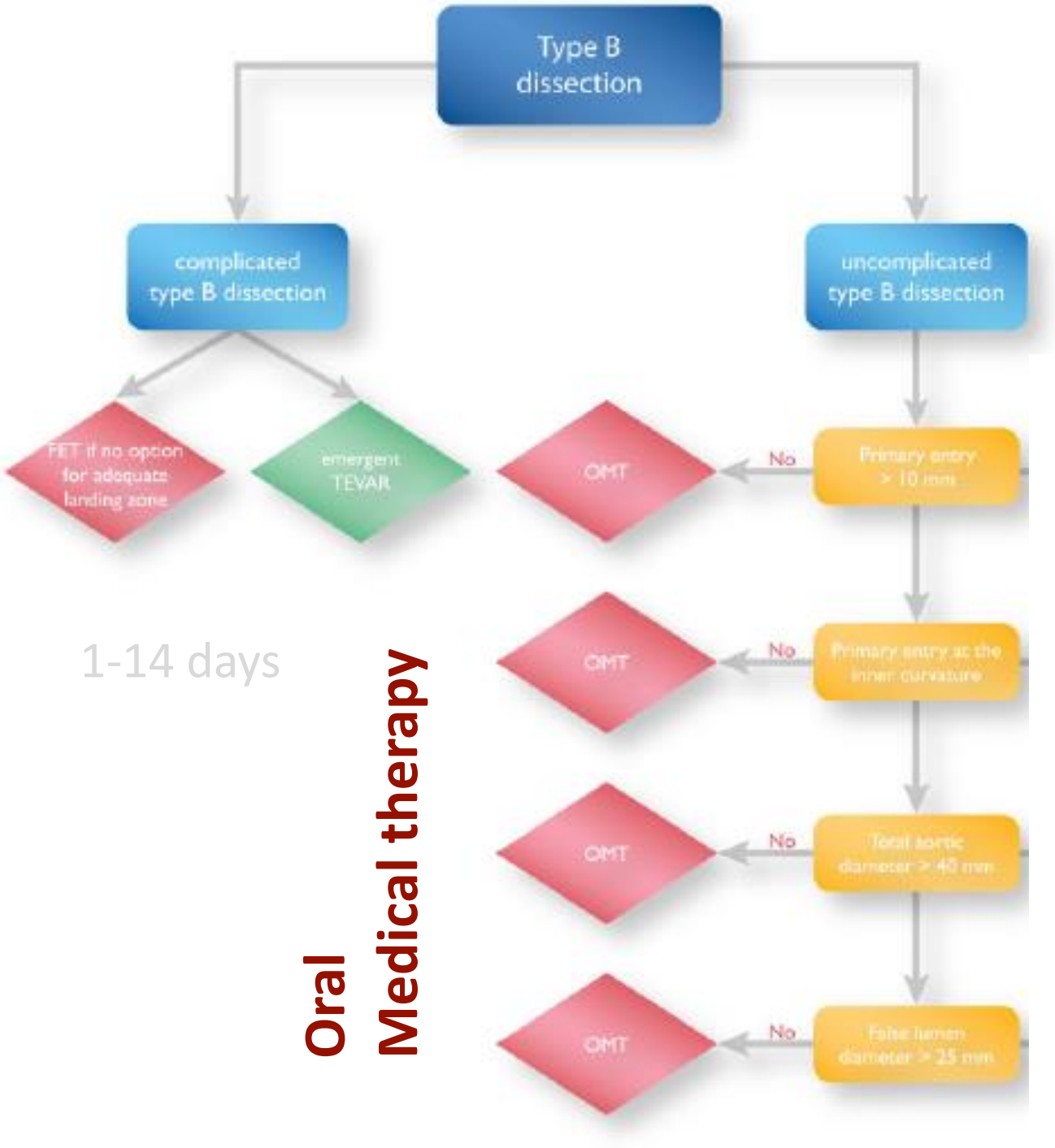
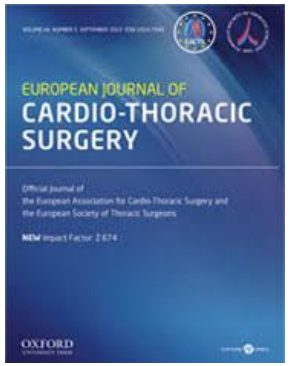




1-14 days

Oral Medical therapy



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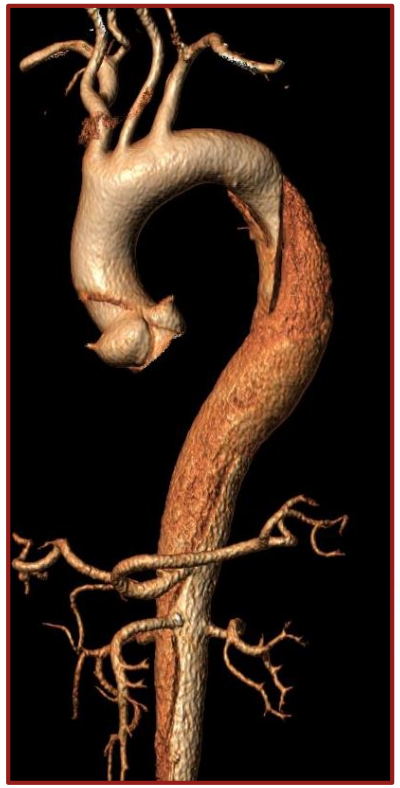

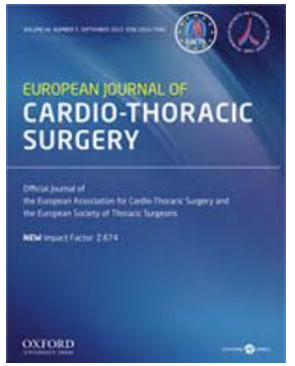

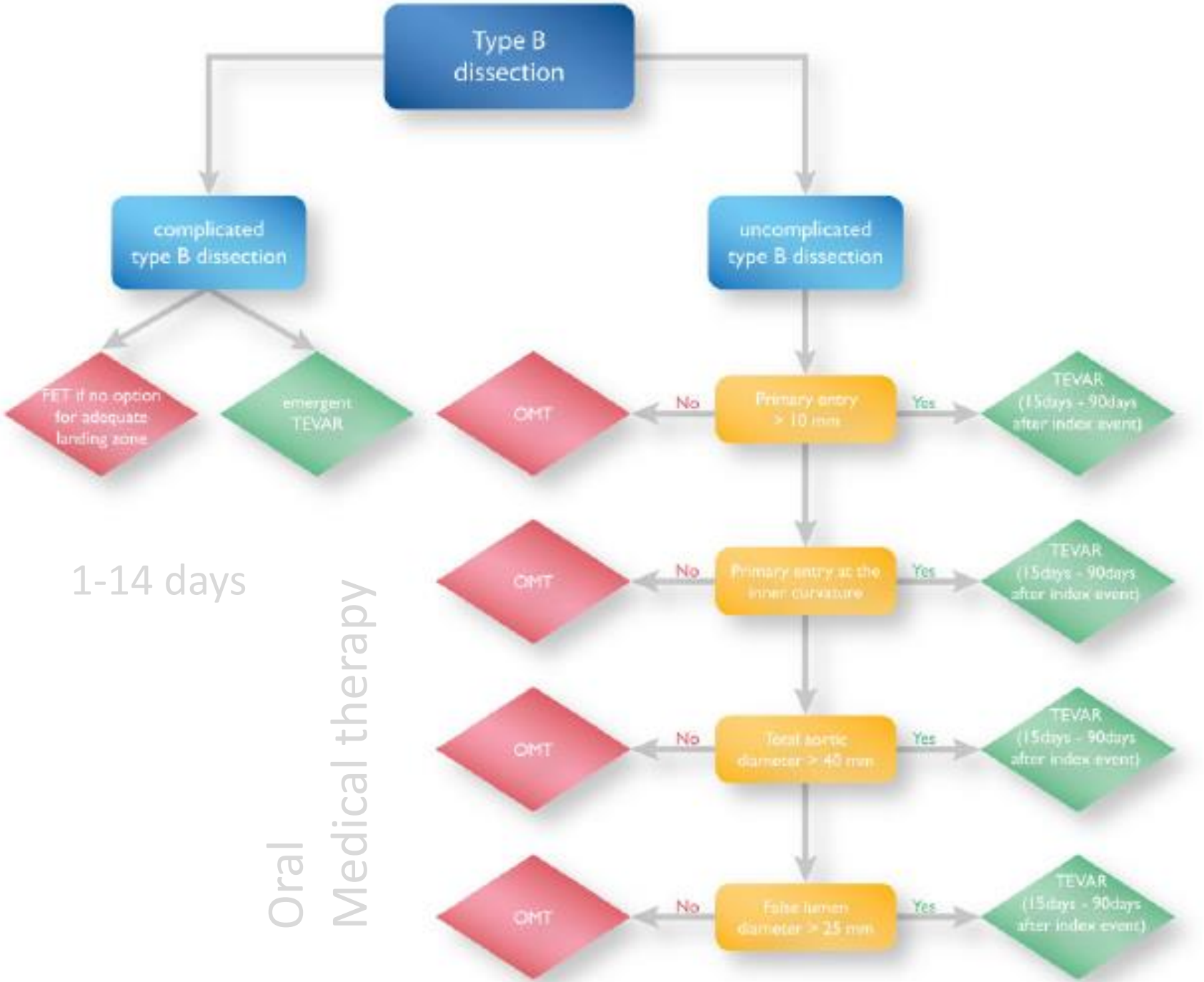

1-14 days

Oral Medical therapy

TEVAR
15 days - 3 months

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When do we intervene ?

Symptoms onset

Complicated TBAD
- Rupture
- Malperfusion
- Refractory pain / HPT
- Rapid enlargement

Uncomplicated TBAD
- High risk radiological features
- Symptoms recrudescence
- Readmission

if *anatomically feasibility*

0 days | 14 days | 3 months

Conclusion - When do intervene ?

1. Conservative medical therapy for uncomplicated cases

arterial pression and pain control

2. Urgent / Emergent TEVAR for complicated cases - < 14 days

± endovascular fenestrations, TVVs spot stenting, adjunctive advanced procedure

3. TEVAR between 15 - 90 days

for acute uncomplicated type B aortic dissection at high risk

Conclusion - When do intervene ?

4. TEVAR for UTBAD in presence of anatomical feasibility

   proximal sealing zone ≥ 25 mm (healthy aorta)
   oversize 10 %
   dedicated device
   LSA revascularization
   CSF-drainage if extensive coverage