

INSTEAD XL: Routine vs. selective TEVAR for Type B dissection

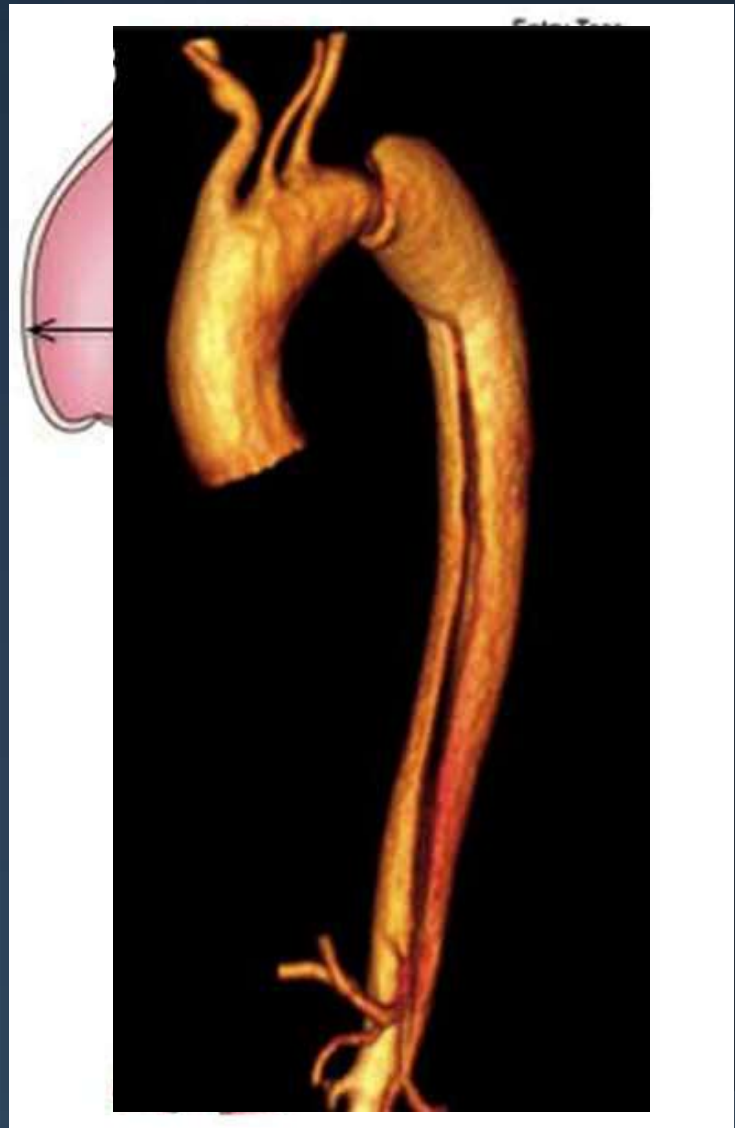
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Indications for aortic repair in acute Type B

- Unresolving chest pain
- Persistent hypertension
- Malperfusion
 - Visceral
 - Lower extremity
- Associated aneurysm
- Contained rupture

Typical patterns of Type B dissection

- Occurs generally without associated aneurysm
- Origin (entry tear)
 - At or just distal to the left subclavian artery
- Body
 - Fenestration(s) may exist communicating with the false lumen (re-entry tear(s))
- Distal
 - Visceral and renal perfusion may come from the false lumen
 - Dissection may extend into the iliac arteries



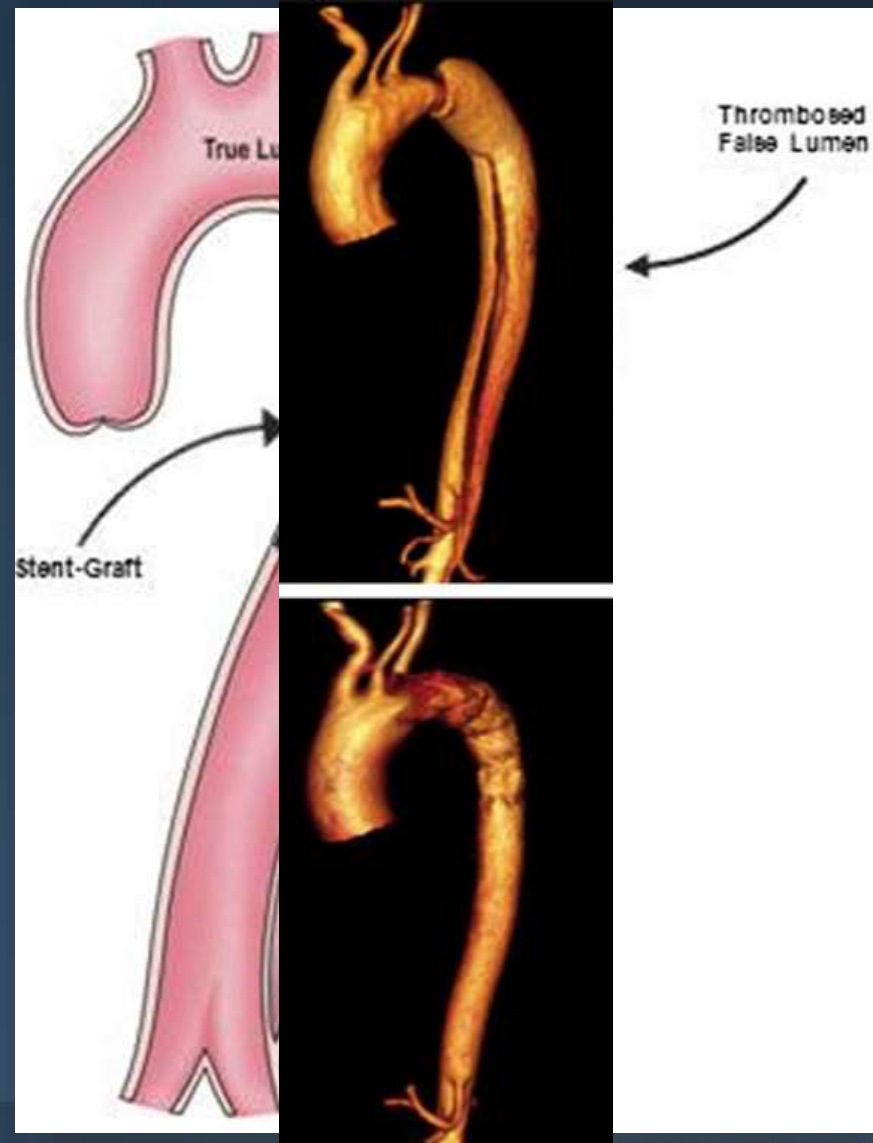
Natural history of Type B dissection managed medically

- 5 year mortality 20%-42%
 - False lumen expansion leading to aneurysm formation
 - 30% mortality once aortic expansion reaches 60 mm



Goals of endovascular repair

- Acute
 - Relieve symptoms
 - Re-establish distal perfusion
 - Treat aneurysm/rupture
- Long-term
 - Reduce late false lumen aneurysm formation
 - Induce false lumen thrombosis



INSTEAD-XL study

- Goal: To assess long term outcomes in stable Type B dissection
- Methods: 140 patient randomized 1:1 to OMT or OMT plus TEVAR
- Primary endpoint: 2 year all-cause mortality
 - Secondary endpoints: aorta-related death, aortic progression requiring Rx, aortic remodeling
- “XL”=extended follow-up at 5 years
 - Retrospective assessment of all-cause and aorta-specific outcomes, disease progression



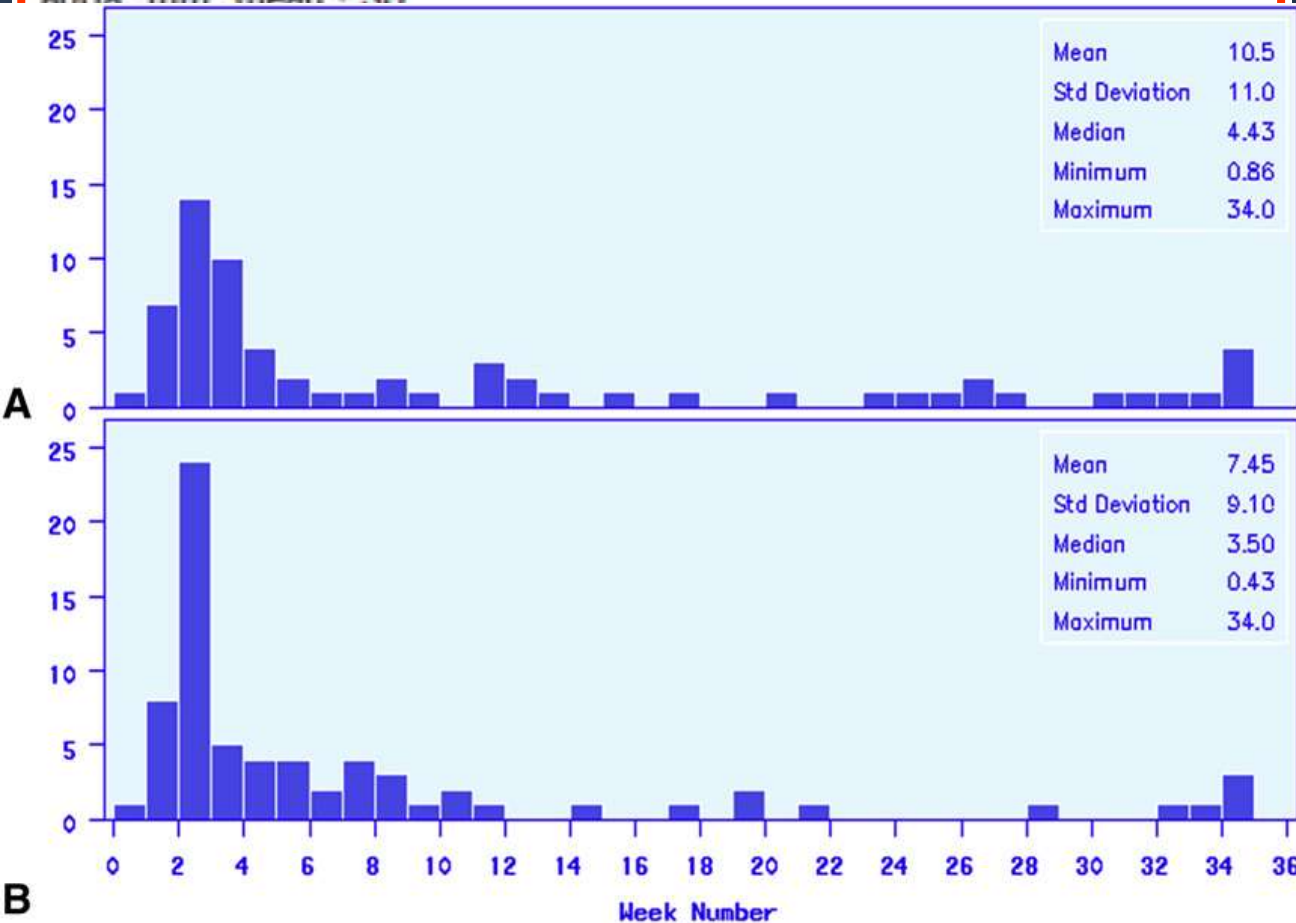
Key inclusion and exclusion criteria

- Inclusion:
 - Between 2-52 weeks after dissection
- Exclusion
 - If clear indication for repair
 - Diameter >6 cm
 - Complicating features
 - If NO clear indication for repair
 - False lumen thrombosis
 - Anatomic



Patient and procedural characteristics

Maximum diameter of dissected aorta mm mean+SD 43.5 ± 9.3 44.2 ± 9.5



Procedural success, n (%) $67 (95.7)$

Significant extension into abdomen typical

Relatively long period (mean ~2 months) from event to treatment

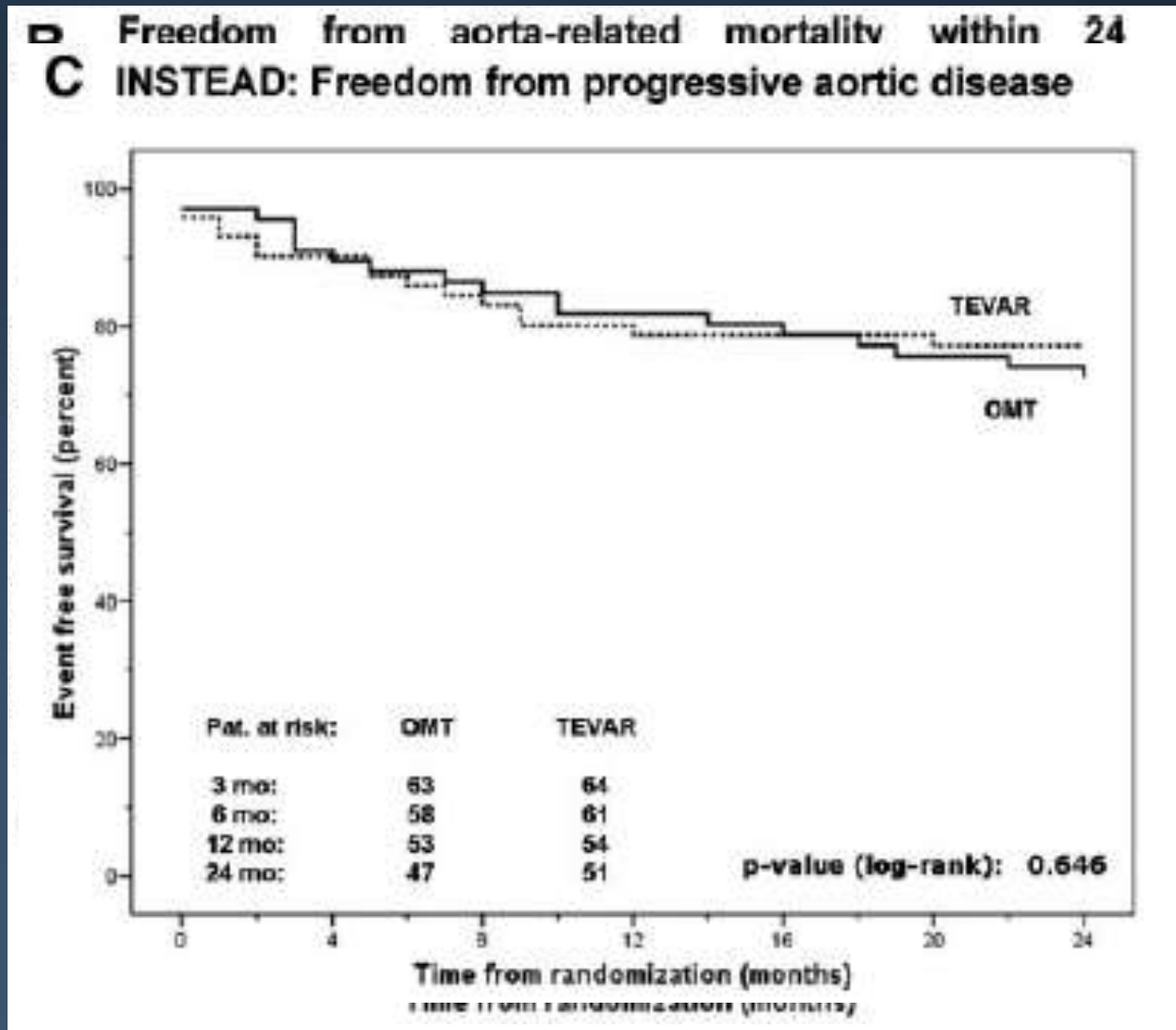
Procedure safe

30 day outcomes

Table 3. Periprocedural Outcomes After TEVAR (30 Days)

Deaths, n (%)	2 (2.8)
Periprocedural events, n (%)	
Retrograde type A dissection	1 (1.5)
Rupture of iliac access vessel	1 (1.5)
Conversion to open surgery	0 (. . .)
Ancillary procedures/injuries	3 (4.5)
Stenting of iliac artery	1 (1.5)
Aortic stent-graft extension	1 (1.5)
Aortic bare-stent extension	1 (1.5)
Periprocedural neurological events, n (%)	
Paraplegia/paraparesis	2 (2.9)
Major stroke	1 (1.5)

Results: no differences in 2 year outcomes



No differences in progressive aortic disease

Related deaths evenly distributed

Table 4. Case Fatalities After Randomization

Patient	Age, y	Sex	Group	Interval, d		Thoracic False-Lumen Status	Related Death	Detailed Information
				Dissection to Randomization	Randomization to Stent Graft			
1	65	M	OMT	244	N/A	Minimal partial thrombosis	Yes	Delayed rupture of enlarging false lumen
2	73	M	TEVAR	71	1	Complete thoracic thrombosis	Yes*	Postprocedural rupture of access vessel
3	53	M	TEVAR	30	29	Complete thoracic thrombosis	Yes*	Abdominal redissection with intestinal malperfusion
4	66	F	TEVAR	15	1	Complete thoracic thrombosis	Yes*	Postprocedural type A dissection with tamponade
5	68	M	OMT	73	N/A	Minimal partial thrombosis	Yes	Rupture of thoracic aorta
6	56	M	TEVAR	53	40	Entry closed, partial thrombosis	Yes*	Rupture of thoracic aorta
7	61	M	TEVAR	293	22	Type I endoleak, partial thrombosis	No	Fatal hemorrhagic stroke in severe hypertension
8	74	M	TEVAR	112	12	Complete thoracic thrombosis	No	Sudden cardiac death from ventricular fibrillation
9	63	M	OMT	15	N/A	Complete thoracic thrombosis	No	Metastasized renal cancer
10	70	M	TEVAR	17	Died 2 days after randomization but before TEVAR	No false-lumen thrombosis	No	Pulmonary embolism
11	77	M	OMT	90	Died 10 days after randomization; opted out for stent graft and died before TEVAR	No false-lumen thrombosis	No	Myocardial infarction

Conclusions from primary study

- No clear advantage of routine TEVAR in uncomplicated Type II dissections
 - Selective use and routine follow-up appropriate
- My critique:
 - Device may not have been optimized for dissection
 - The age of dissections may limit TEVAR effectiveness
 - Dissection flap thickens and scars with time



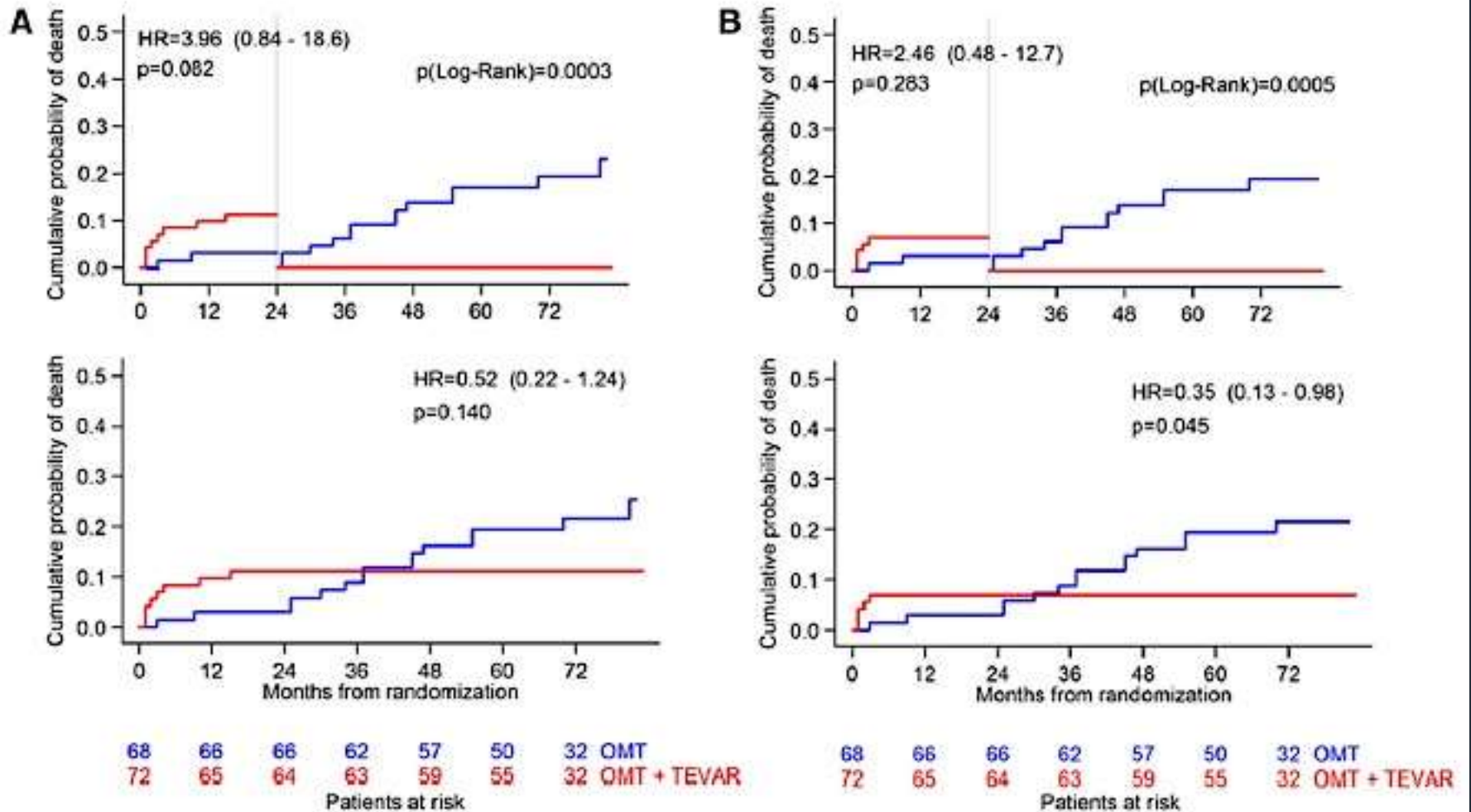
INSTEAD XL: 5 year retrospective follow-up

Table 3. Causes of Death Since Randomization

	OMT	OMT+TEVAR
0-12 mo	#01 (AR-73) MPS	#01 (AR-6) type A
	#02 (AR-244) R	#02 (AR-15) R
		#03 (AR-30) MPS
		#04 (AR-53) R
		#05 (AR-71) R
		#06 (NR-112) AMI
		#07 (NR-293) PN
12-24 mo	#03 (AR-722) R	#08 (NR-429) cancer
24-36 mo	#04 (AR-745) R	
	#05 (AR-900) type A	
	#06 (AR-1000) SD	
36-48 mo	#07 (AR-1101) R	
	#08 (AR-1110) R	
	#09 (AR-1344) SD	
	#10 (AR-1349) R	
	#11 (AR-1401) R	
48-60 mo	#12 (AR-1629) SD	
	#13 (AR-1650) R	
60-72 mo	#14 (AR-2075) SD	
	#15 (NR-2421) cancer	

No one in the TEVAR group died in the 3-5 year interval

All-cause and aorta-specific mortality



Freedom from progressive aortic disease

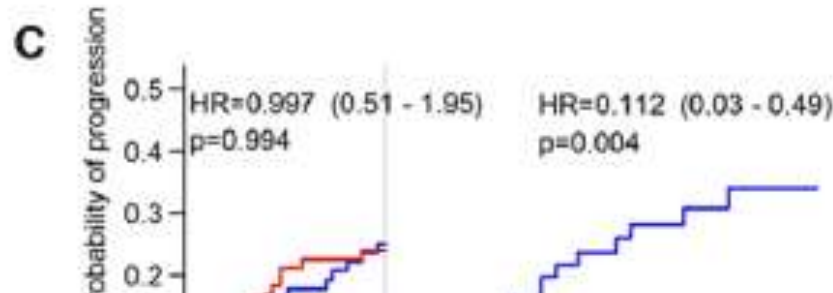
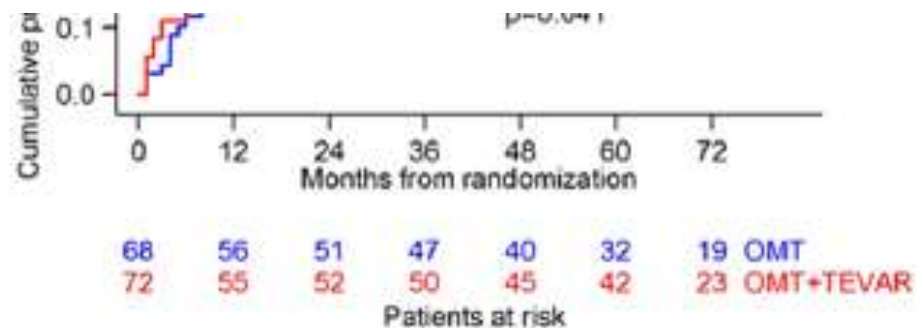


Table 5. Aortic Morphology at 5 Years

	OMT	OMT+TEVAR	P Value
FL thrombosis	11/50 (22.0%)	48/53 (90.6%)	<0.0001
Partial FL/no FL thrombosis	39/50 (78.0%)	5/53 (9.4%)	<0.0001
Remodeling of thoracic aorta*	5/50 (10.0%)	42/53 (79.2%)	<0.0001
Critical expansion of thoracic aorta†	33/50 (66.0%)	11/53 (20.8%)	<0.0001



Conclusions

- Single small study suggests that routine TEVAR for uncomplicated Type B dissection resulted in improved survival compared with OMT
 - No TEVAR group deaths from 3-5 years may have been a chance finding
 - But...aortic remodeling suggests that the effect is real and likely related
- In younger patients with Type B dissection, a discussion regarding the benefits and risks of prophylactic TEVAR is reasonable
- Larger trials, dedicated devices, subclavian bypass, spinal drainage in selective patients may mitigate some of the TEVAR related complications and make the case for routine use even more compelling

