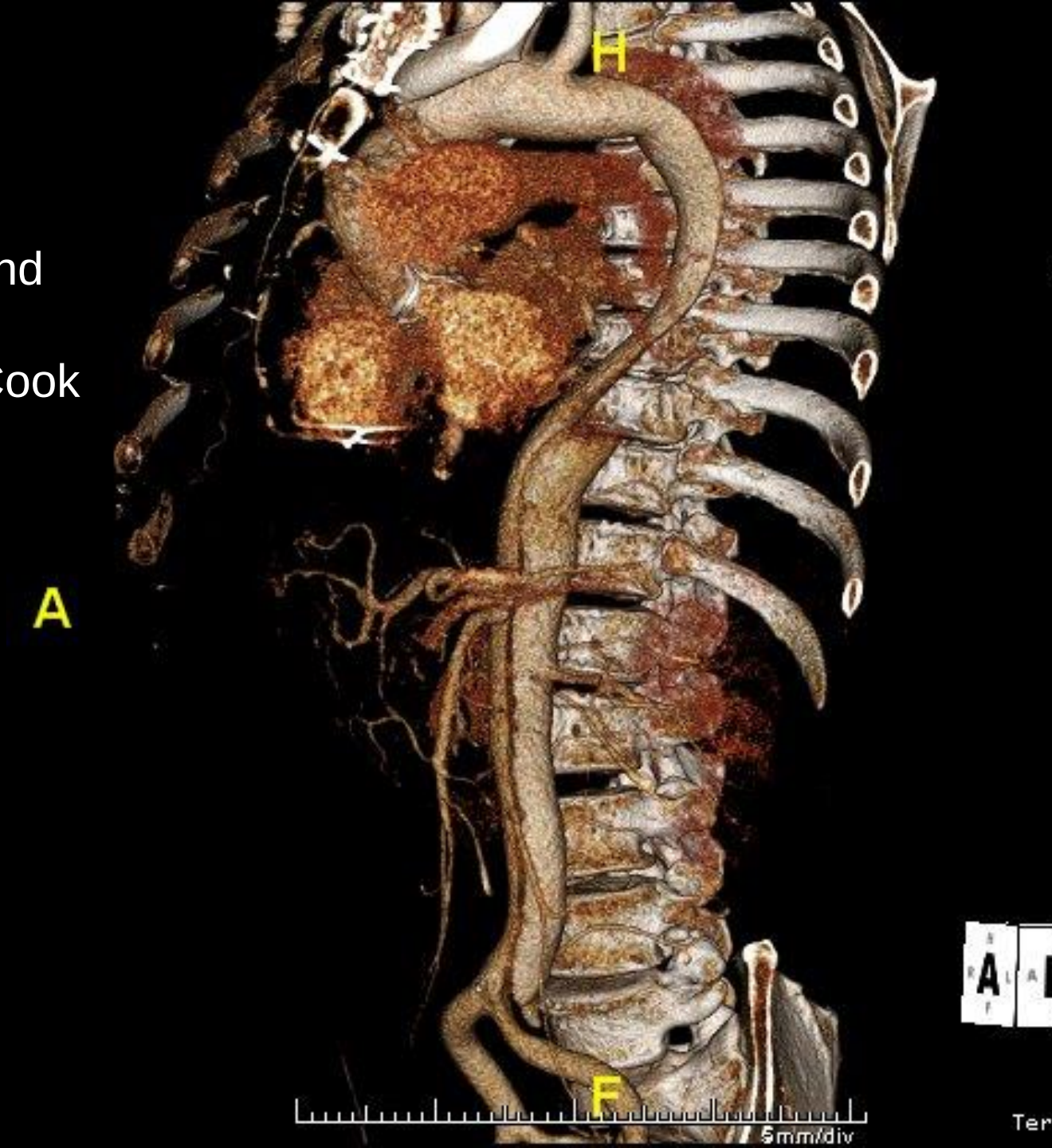
Malperfusion and Acute Dissection

What is the Best Strategy?

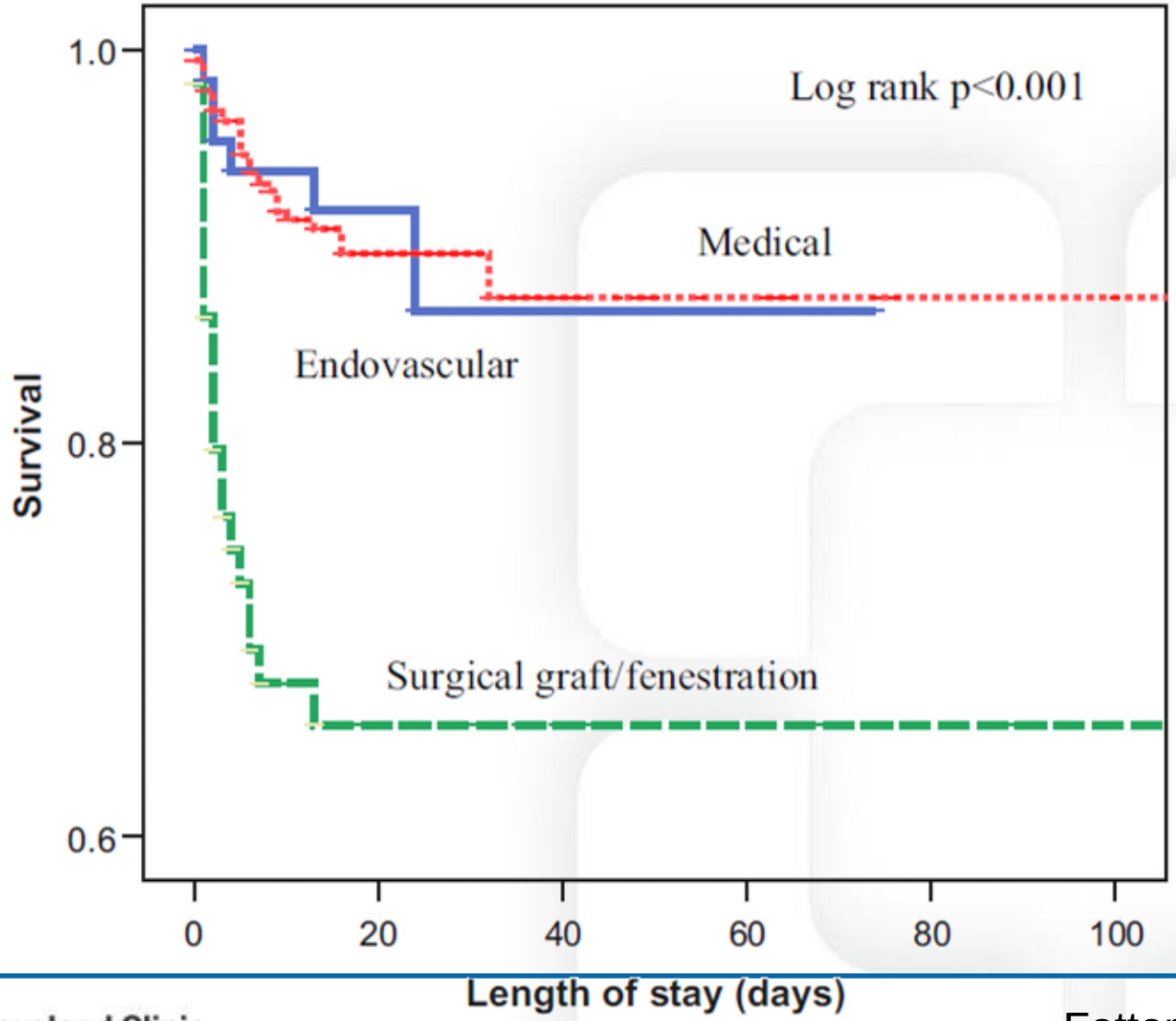
Tara M Mastracci, MD FRCS(C) FACS MSc
Assistant Professor of Surgery,
The Cleveland Clinic Foundation

Disclosures

Consultation and Proctorship Agreements: Cook Medical Inc.



Endovascular has changed our Approach to Dissection

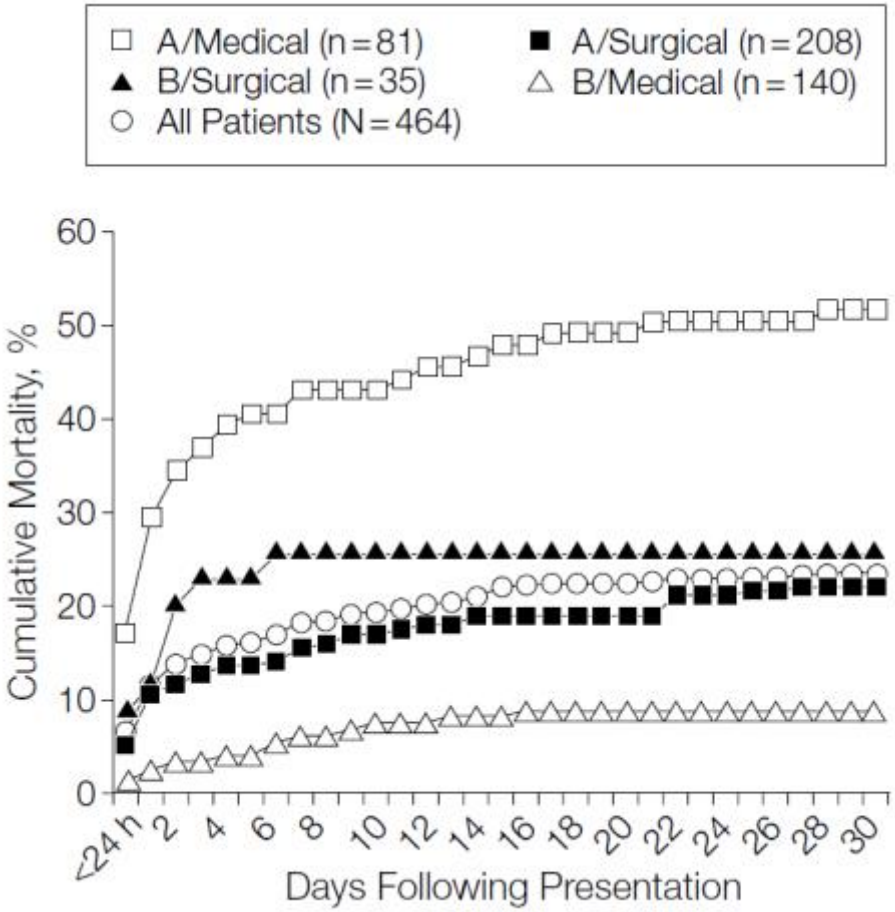


Cleveland Clinic

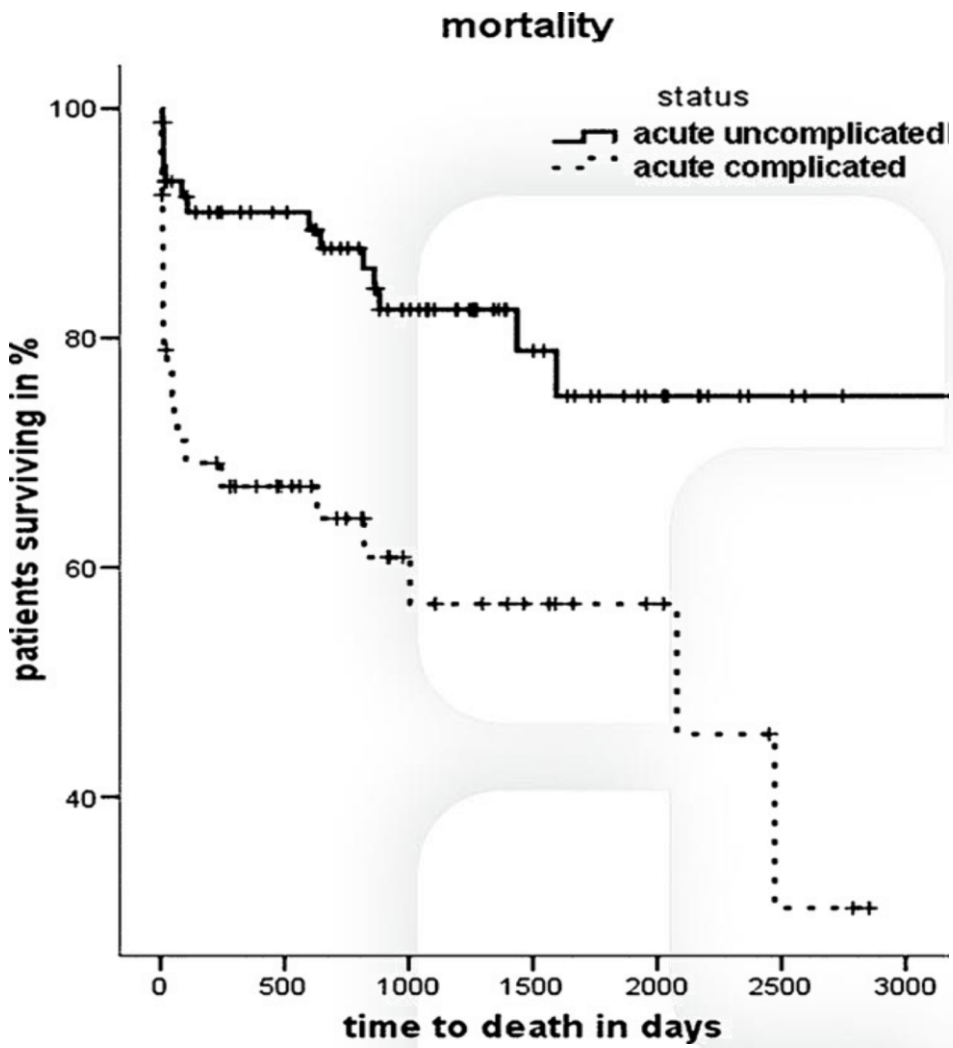
Fattori et al, 2008

Dissection is a Lethal Disease

- N=175 type B Dissections
- 35 surgical, 140 medical
  - Surgical mortality 31.4% (95%CI 16-47)
  - Medical mortality 11% (95%CI 5.6 – 16)
  - All dissections, in hospital mortality= 14.9% (95%CI 10-20)
- Most Common cause of death:
  - Aortic Rupture: 38.5% (95%CI 29 – 48)
  - Visceral Ischemia: 15.4% (95%CI 8-22)

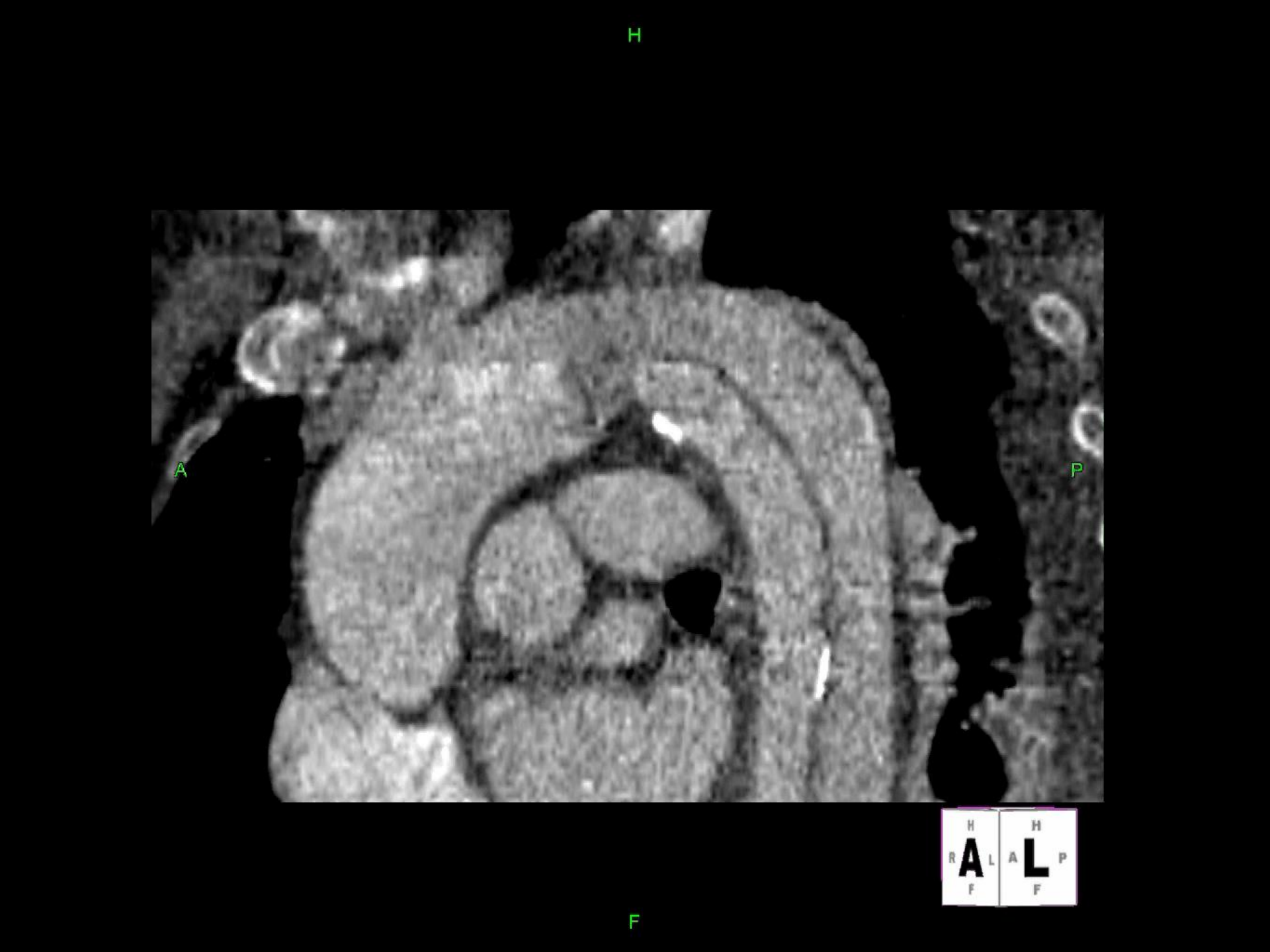


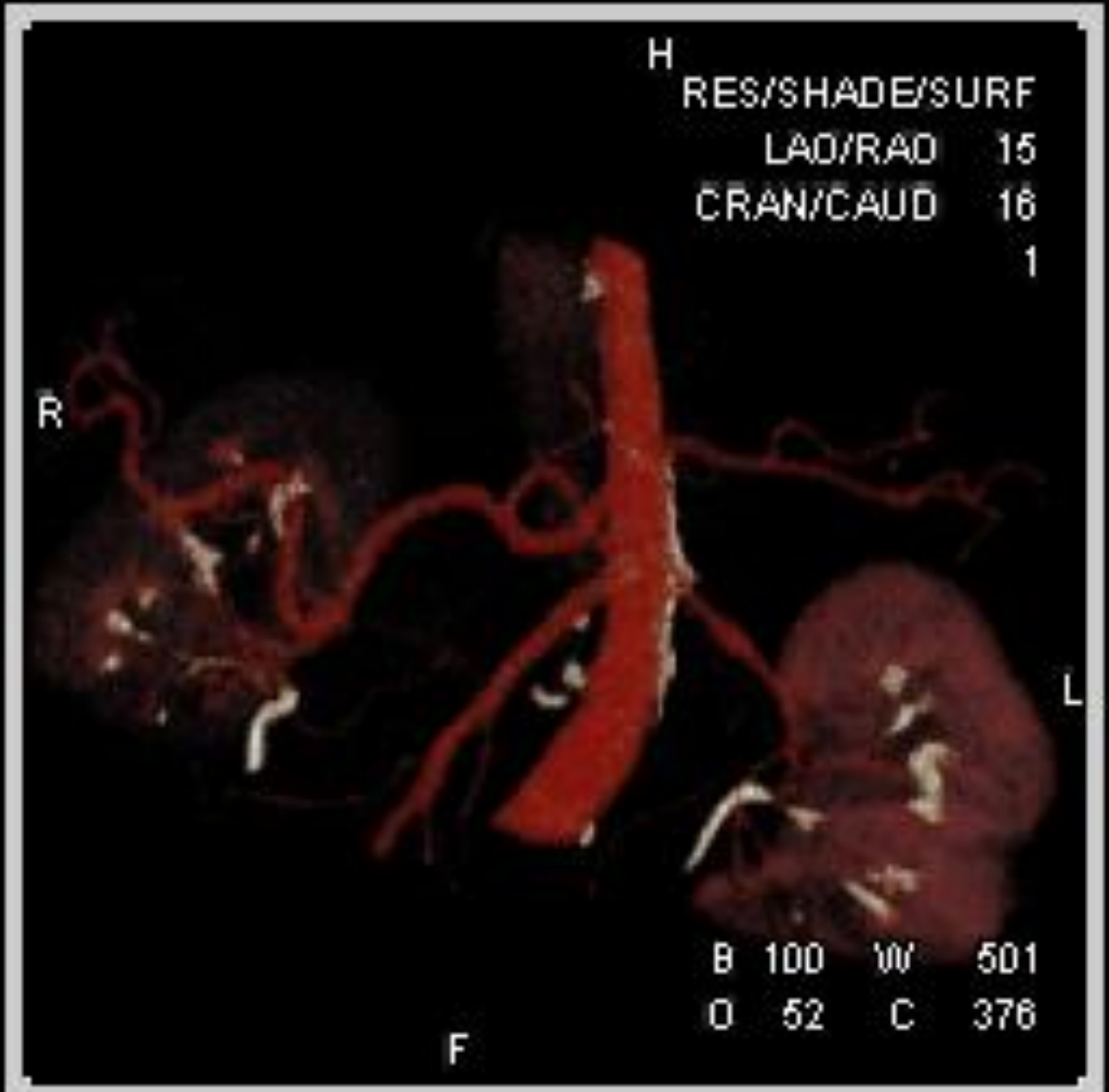
Malperfusion in Type B and Survival



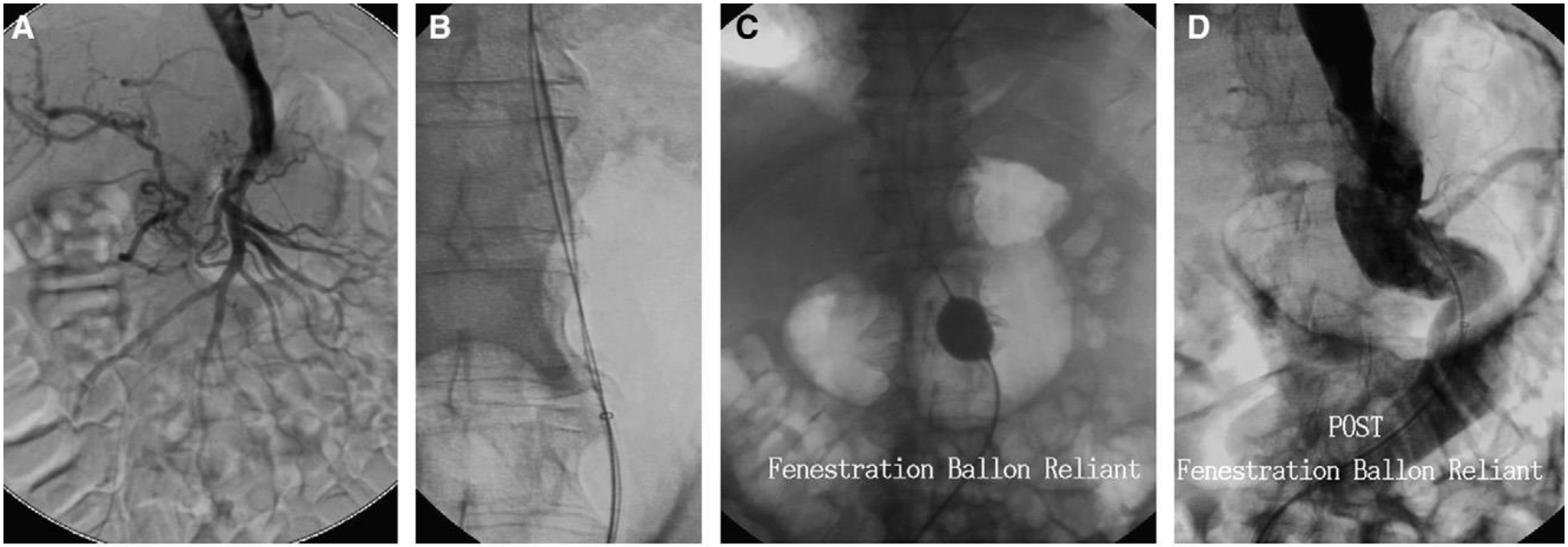
Cleveland Clinic

Garbade et al, 2010


H
A
P
F

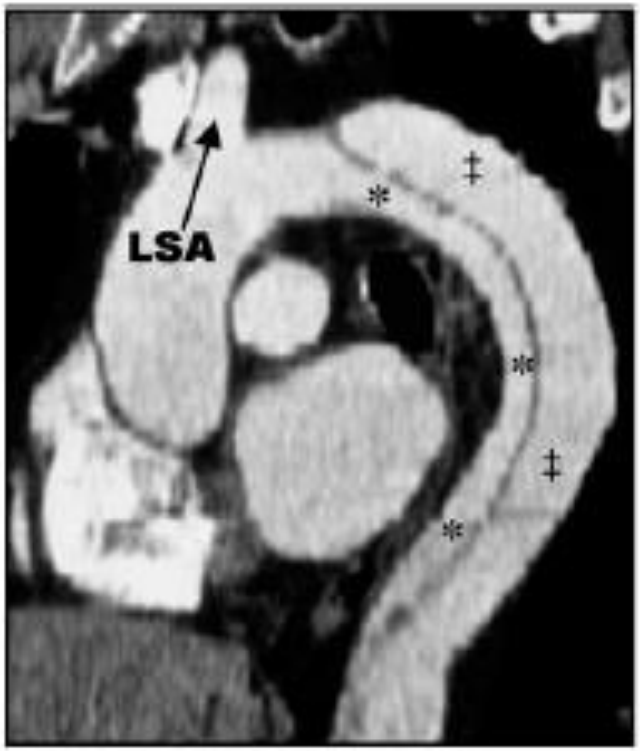

H
RES/SHADE/SURF
LAO/RAO 15
CRAN/CAUD 16
1
R
L
B 100 W 501
O 52 C 376
F

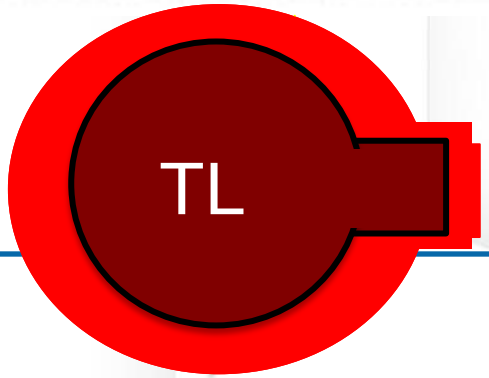
Fenestration (and Branch Stenting)



Midulla et al, 2011

Aortic Stenting





Short Term Mortality: Endovascular Approach

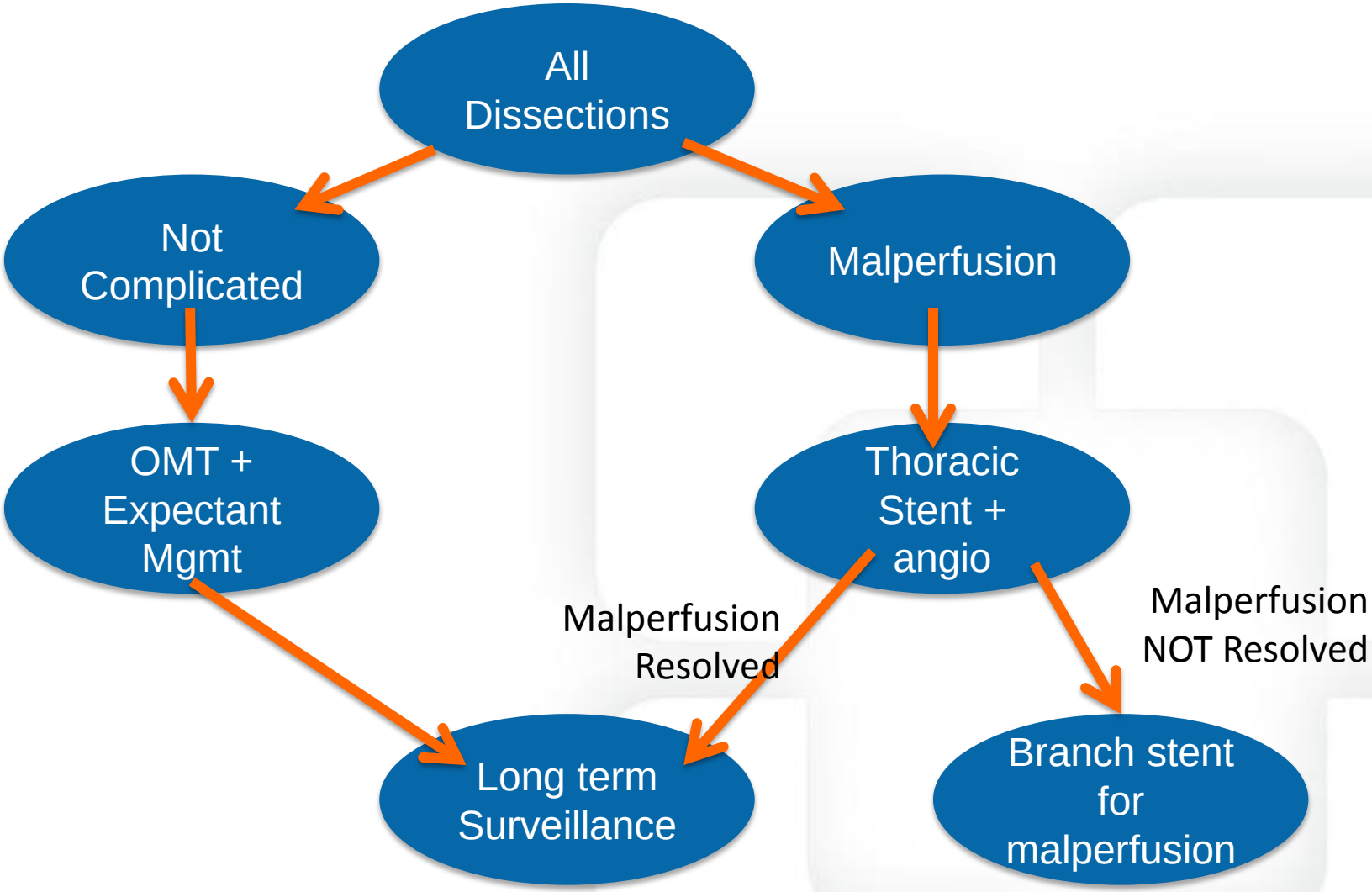
	N	Intervention	30 Day Mort %
Dias 2006	31	Stent	16
Schoder 2007	24	Stent	10.7
Szeto 2008	35	Stent	2.8
Verhoye 2008	16	Stent	25
Pearce 2008	15	Stent	13.3
Feezor 2009	33	Stent	21
Khoynezhad 2009	28	Stent	11
Patel 2009	69	Fenestration	17.5
Cambria 2009	19	Stent	16
Younes 2010	17	Stent	5.5
Naughton 2011	17	Stent/Fen	0

How Often do Branches Require Stenting?

		N	Periop mort	Death d/t Rupture	Branches stented	Details
1°TEVAR	Ehrlich et al	32	4/32	2/4	6	3 Renal, 2 Celiac 1 SMA
	Sfyroeras et al	23	2/23	0/2	5	--
	White et al	58	5/58	--	4	1 Celiac, 2 Renal
	O'Donnell et al	26	3/26	1/3	8	1 Celiac, 2 SMA 7 Renal
	Alves et al	45	3/45	--	2	--
	Feezor et al	11	7/33	1/7	8	5 iliac, 5 mesenteric 4 renal
Mixed	Khoynezhad et al	15	3/28	0/3	3	3 fenestrations
1° Fen	Patel	69	12/69	5/12	44	--
	Midulla	35	12/35	0/12		9 sma,14 renal

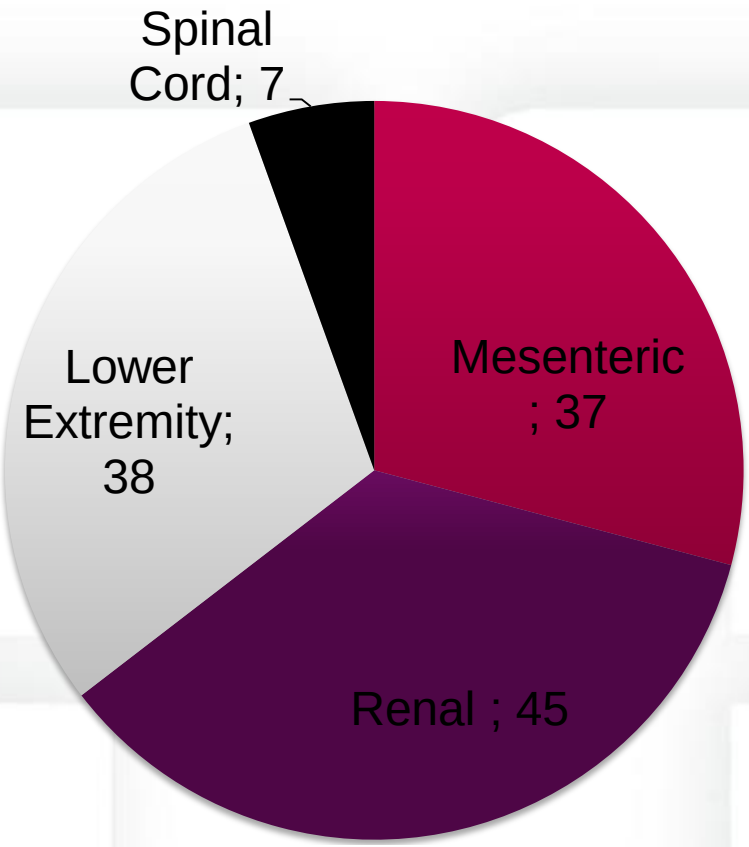
?? Long Term Outcomes ??

The Cleveland Clinic Approach



Malperfusion at Cleveland Clinic 1999 - 2011

- 61 patients presented with malperfusion
- 43/61 had >1 effected bed
- 54/61 included mesenteric or renal



Ryan, Mastracci, Sarac JVS 2013

Demographics of Patients with Malperfusion

	Number (%)
Male Sex	44(72.1)
Quit Smoking	21(34.4)
Obesity	26(42.6)
Heart Disease	19 (31.1)
Diabetes	15 (24.6)
Previous Aortic Operation	10 (16.4)
COPD	11 (18.0)

Ryan, Mastracci, Sarac JVS 2013

Details of Care

	Number (%)
Time to Treatment (>24h)	25 (41.0)
Stent = Gore	38 (62.3)
Stent = Zenith	21 (34.4)
LSA occlusion	37 (60.6)
LSCBG	8 (13)
Branch Vessel Stenting	25 (41)

Ryan, Mastracci, Sarac JVS 2013

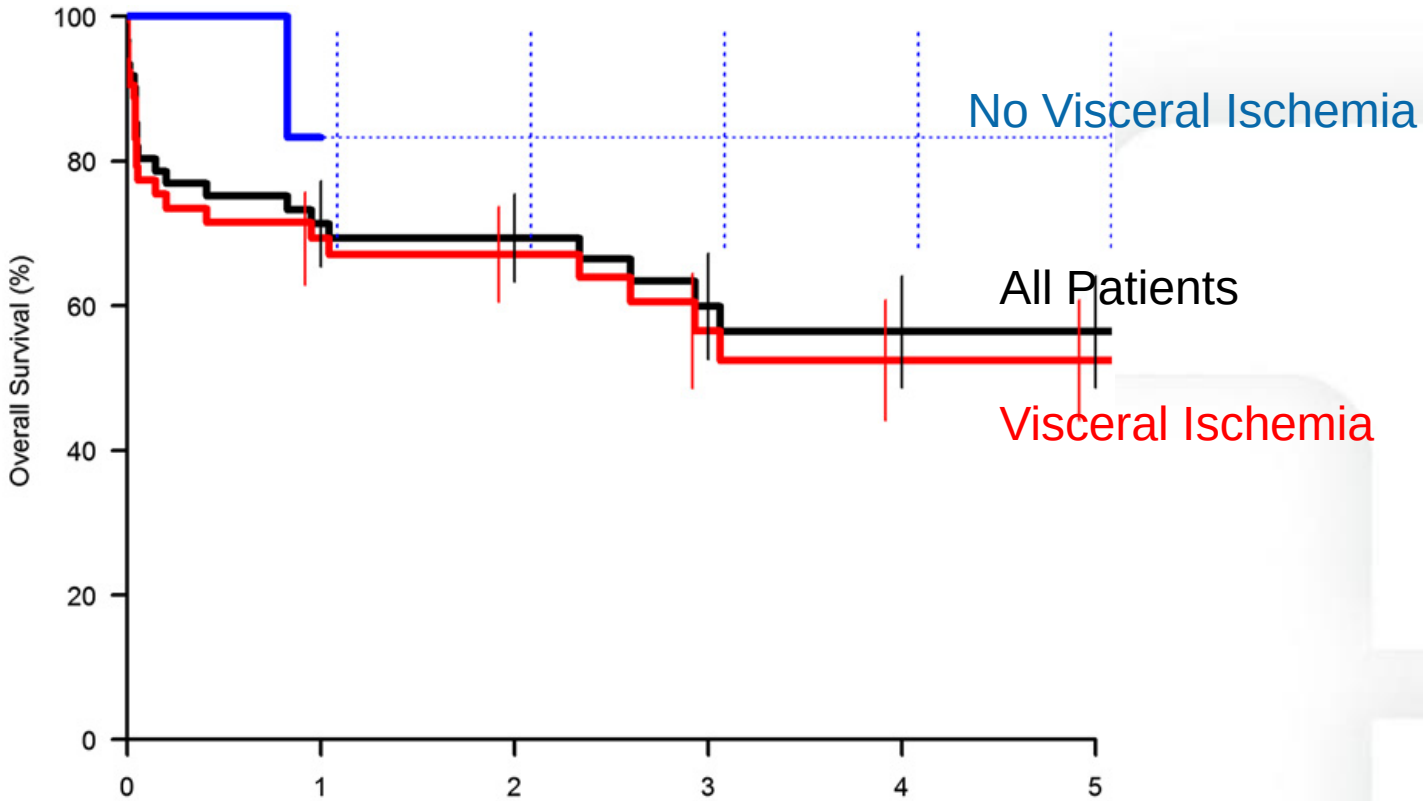
Complications after TEVAR for Malperfusion

	Number (%)
Acute Renal Failure	41 (67.2)
Transient Dialysis	7 (17.1)
Permanent Dialysis	15 (36.6)
Pulmonary Failure	27 (44.3)
Tracheostomy requirement	11 (40.7)

Late Aortic Event	Number (%)	Reintervention No. (%)
Retrograde extension	2 (3.3)	1 (50)
Aneurysmal Degeneration	7 (11.5)	8 (57.1)
Type I endoleak	7 (11.5)	4 (57.1)
Type II endoleak	4 (6.6)	3 (75.0)
Type III endoleak	1 (1.6)	1 (100)
Aortic Rupture	0	

Ryan, Mastracci, Sarac JVS 2013

Overall Survival



Visceral Ischemia						
All	61	37	28	17	13	11
Yes	53	32	25	14	11	9
No	8	5	3	3	2	2

Cleveland Clinic

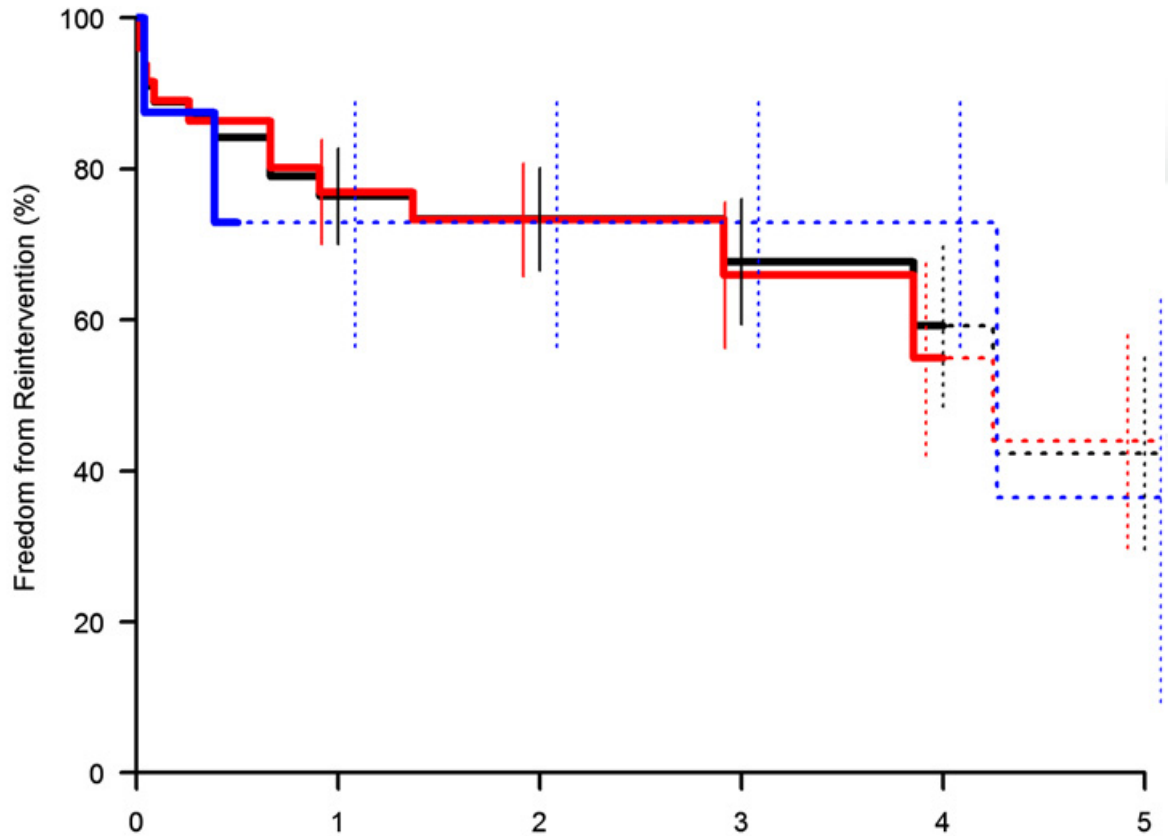
Ryan, Mastracci, Sarac JVS 2013

Factors Associated with Mortality

	Number (%)	HR (95% CI)	P
Male Sex	44(72.1)	0.42 (0.18-0.96)	0.04
Quit Smoking	21(34.4)	0.31(0.1 – 0.99)	0.047
Age		1.02 (0.99-1.05)	0.3
Max Diameter		0.98 (0.94 – 1.02)	0.29
Visceral Ischemia	53(86.9)	3.59(0.48 – 26.7)	0.21
Lower Extremity Ischemia	38(62.3)	0.54(0.23 – 1.25)	0.15
Spinal Cord Ischemia	7(11.5)	2.13 (0.71-6.37)	0.17
LSA Occlusion	37(60.6)	2.97(1.09-8.11)	0.34

Ryan, Mastracci, Sarac JVS 2013

Freedom from ReIntervention



Visceral Ischemia						
All	61	28	21	12	7	5
Yes	53	23	18	9	5	4
No	8	5	3	3	2	1

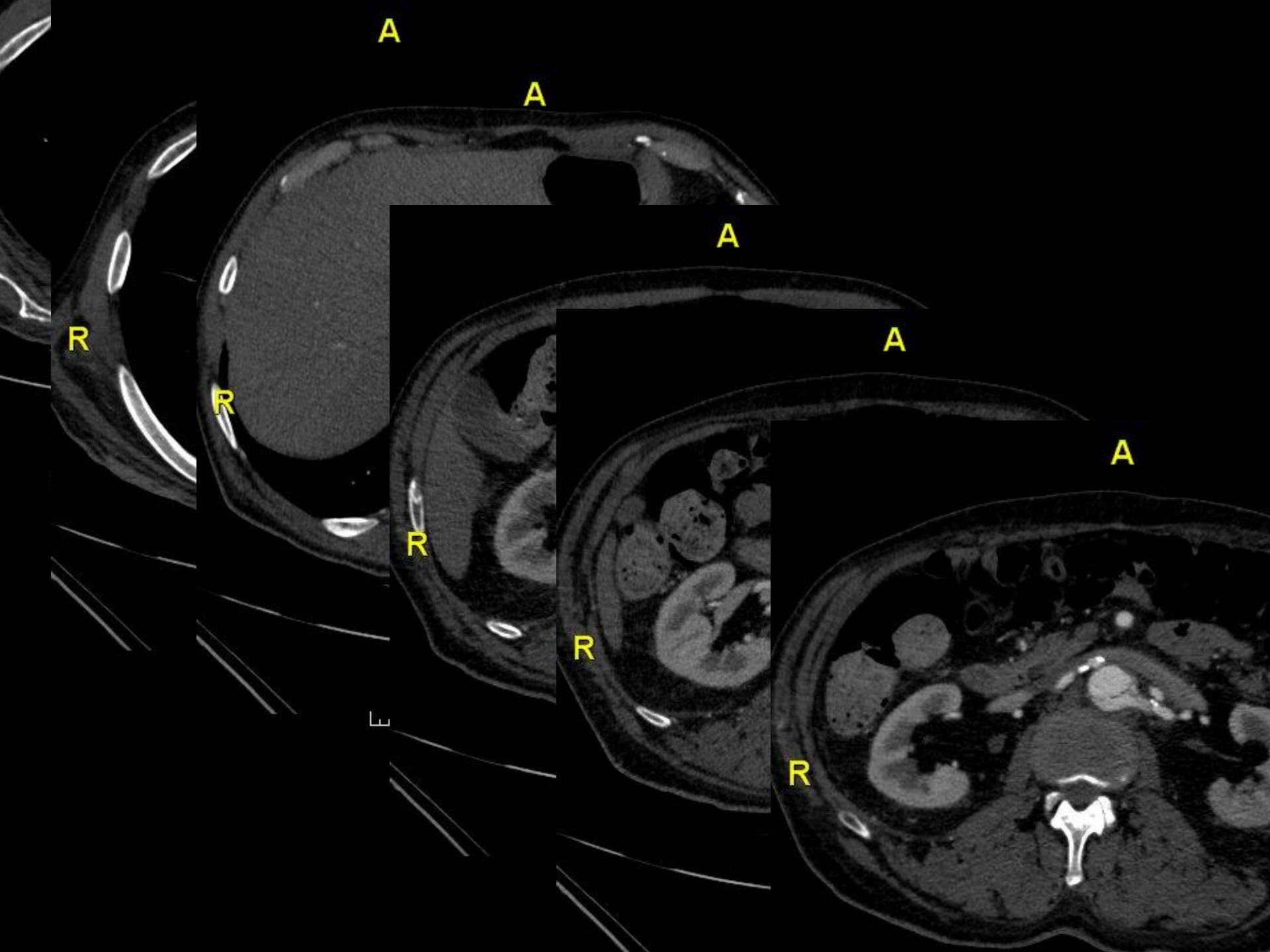
Cleveland Clinic

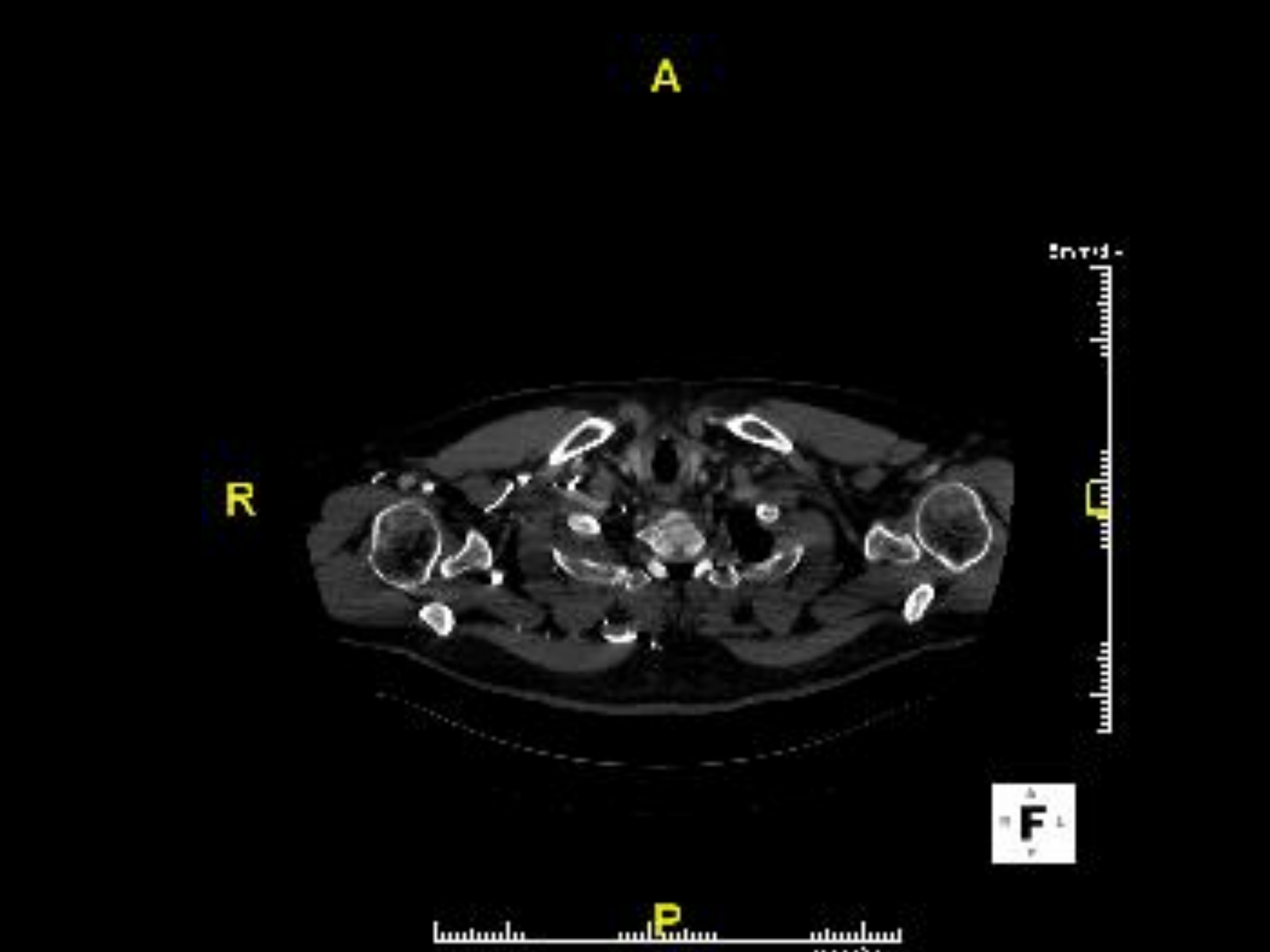
Ryan, Mastracci, Sarac JVS 2013

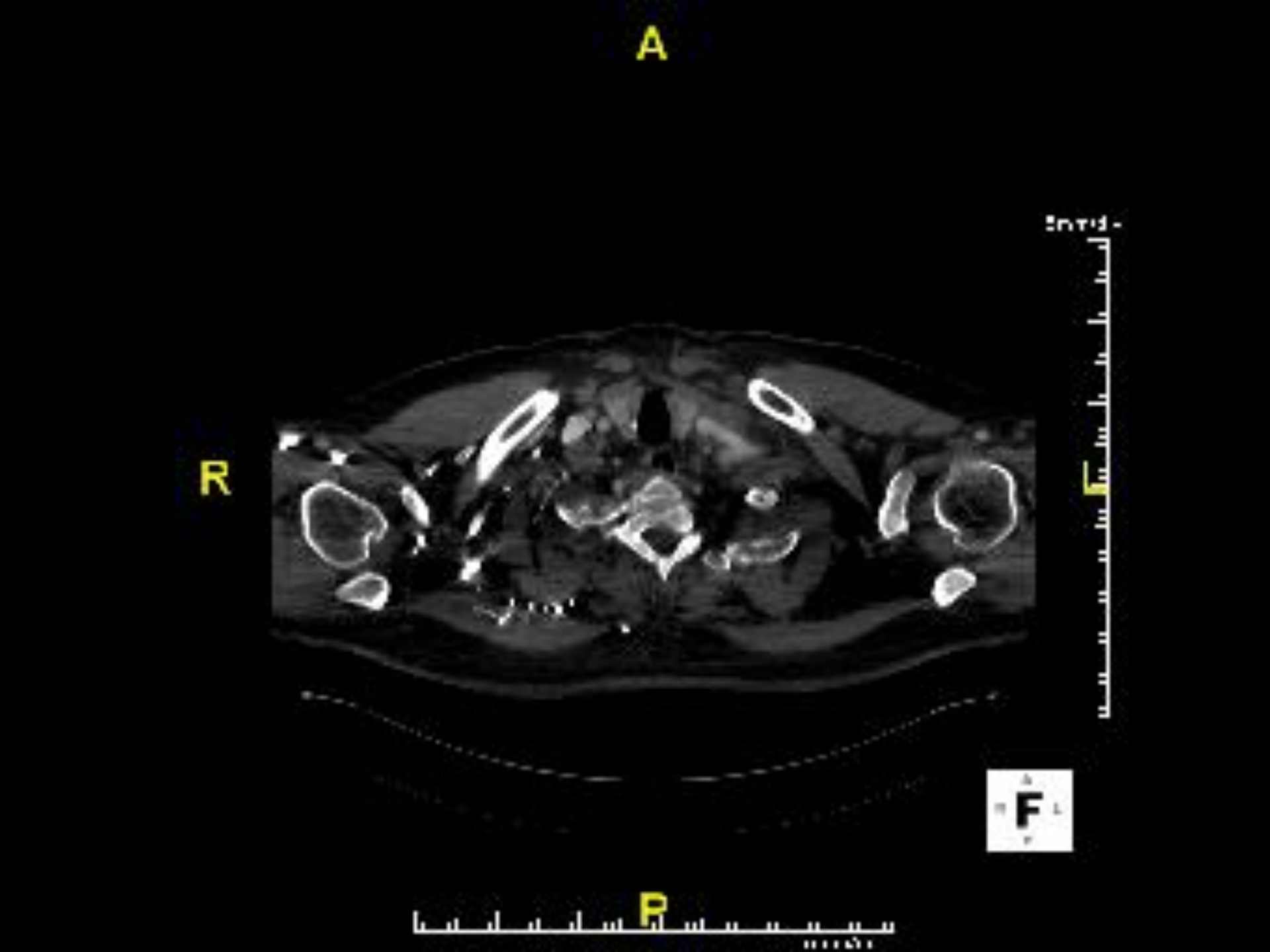
Freedom from Secondary Intervention

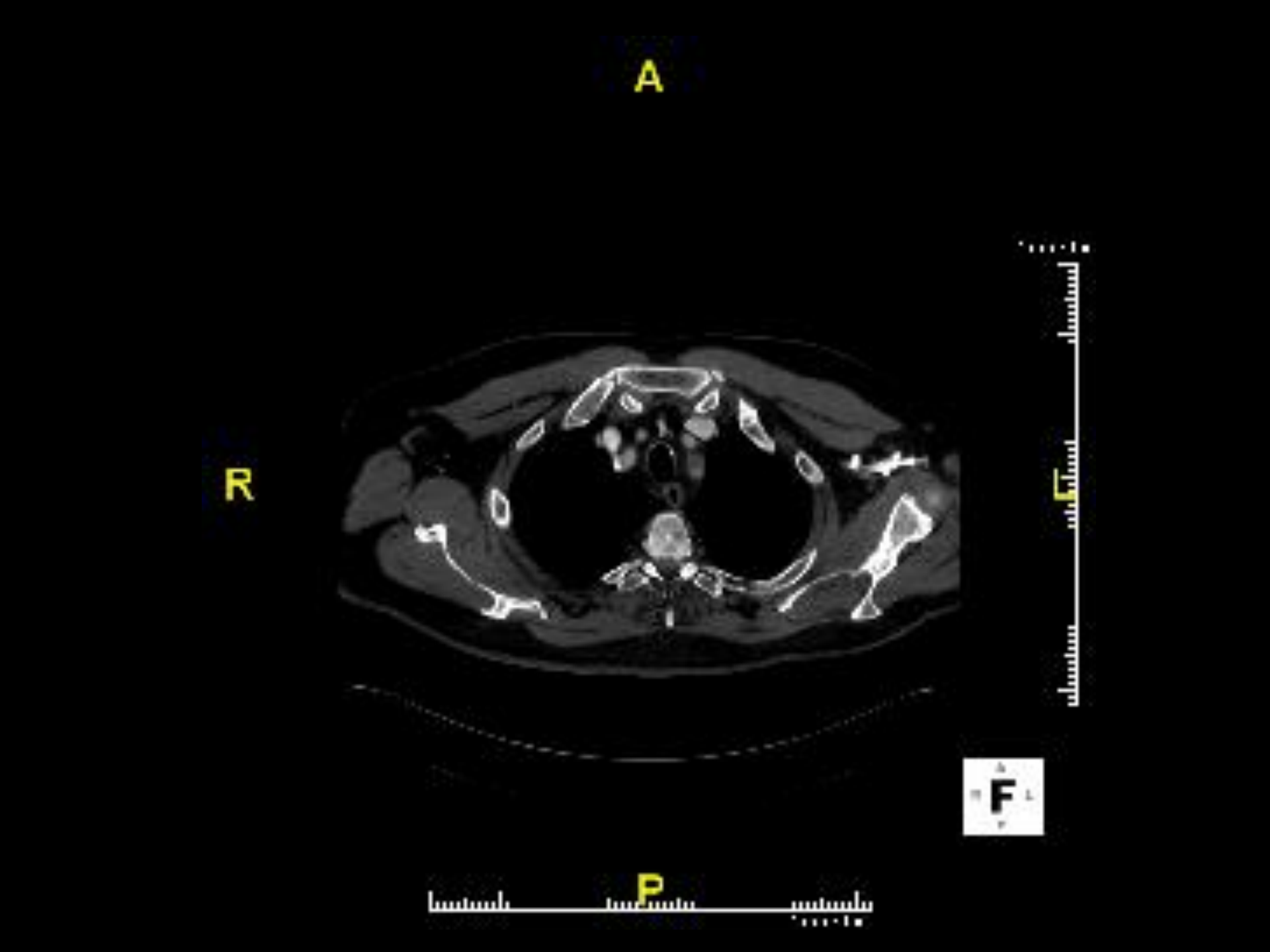
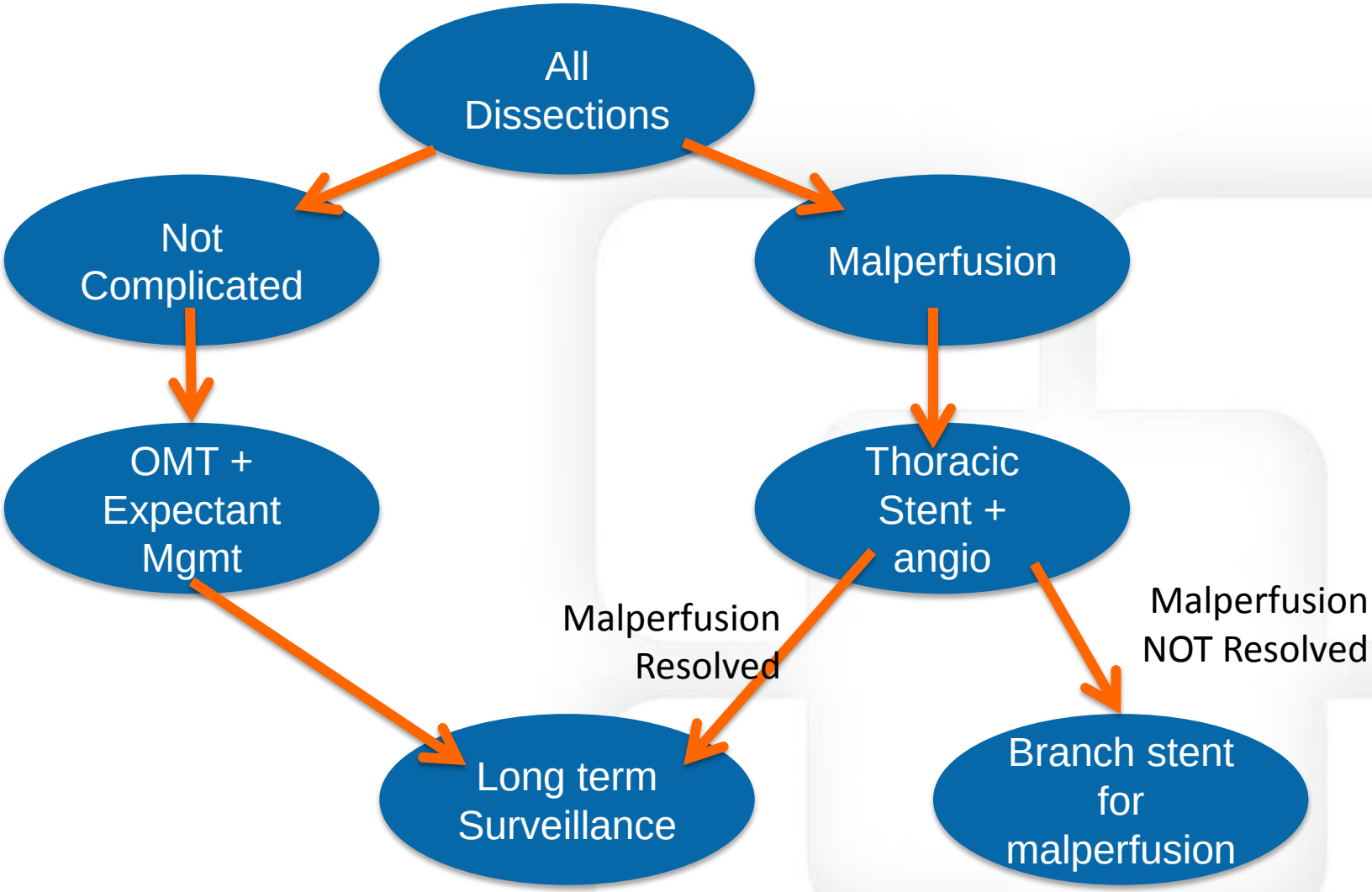
	HR (95% CI)	P
Male Sex	1.39(0.39-4.93)	0.61
Nonsmoker	0.23(0.05-1.05)	0.058
Quit Smoking	0.23 (0.07 – 0.74)	0.014
Lower Extremity Ischemia	0.50 (0.18 – 1.38)	0.18
Spinal Cord Ischemia	5.39 (1.35 – 21.59)	0.017
Mesenteric Ischemia	1.72 (0.60-4.97)	0.31
Branch Vessel Stenting	4.33 (1.39 – 13.5)	0.12

Ryan, Mastracci, Sarac JVS 2013


A
A
A
A
A
R
R
R
R
R
L


A
R
P


A
R
L
P


A
R
L
P

The Cleveland Clinic Approach