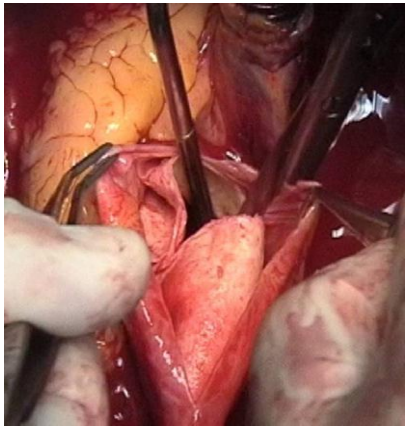


Type A Dissection: anatomical studies

J Sobocinski, B Maurel,
M Guillou, R Azzaoui, S Haulon
Lille University Hospital, France

Disclosures

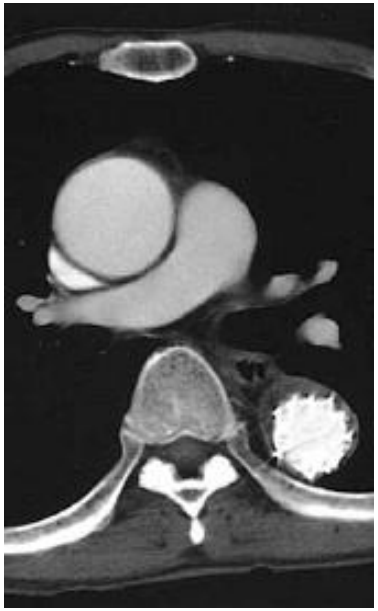
- No conflict of interest

First reported series (10 patients)

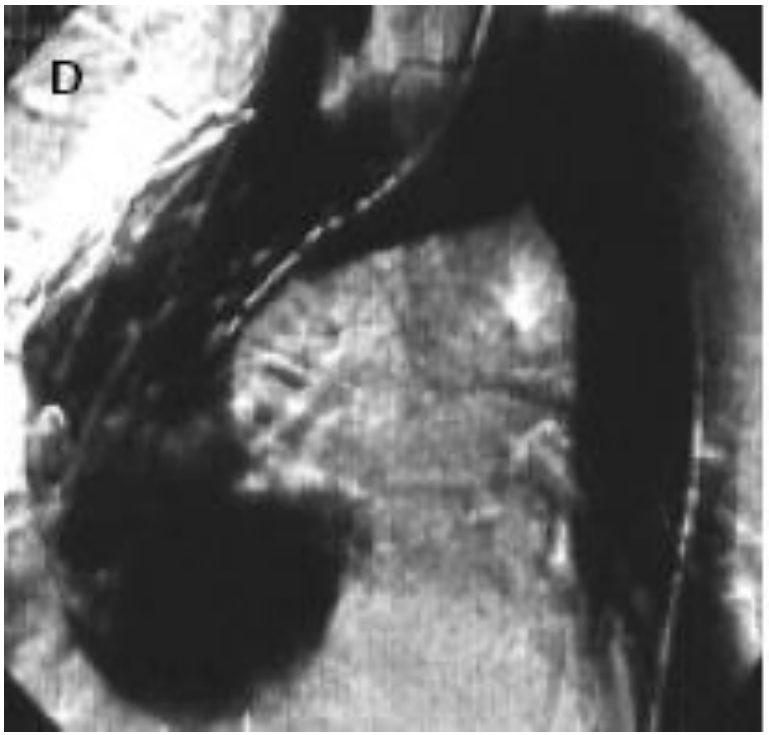
Transluminal placement of endovascular stent-grafts for the treatment of type A aortic dissection with an entry tear in the descending thoracic aorta

Noriyuki Kato, MD,[a] Takatsugu Shimono, MD,[b] Tadanori Hirano, MD,[c] Masaki Ishida, MD,[c] Isao Yada, MD,[b] and Kan Takeda, MD,[a] *Mie, Japan*

J Vasc Surg 2001;34:1023-8



→First reported case of true type A dissection with entry tear located in the ascending aorta



Wang, Asian J Surg 2003;26(2):117-9

Numerous case reports since 2003...

2004 – Zhang H *et al.*
2004 – Ihnken K *et al.*
2006 – Zimpfer D *et al.*
2007 – Senay S *et al.*
2011 – Mangialardi N *et al.*

... some innovative progress

Aortic Dissection & Ascending aorta

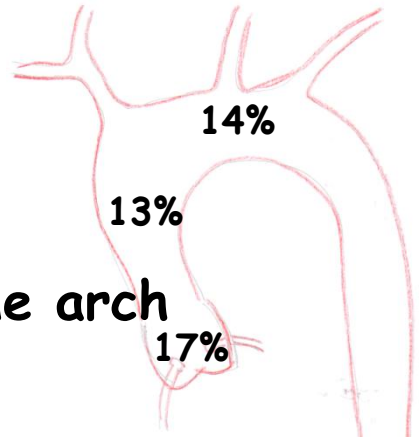
→ Only Few papers on the understanding of the anatomical & physiological features

What do we know about the Aorta ?

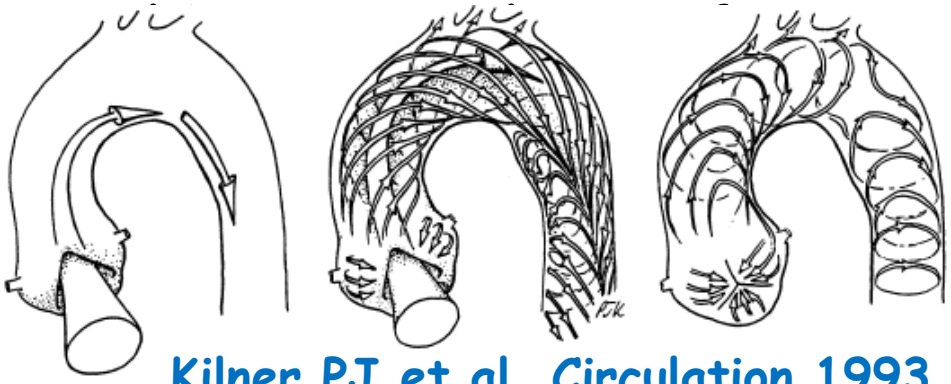
Median rate of variation in diameter

Length & Diameter depending on: Age, sex

Van Prehn J et al. JET 2007
Roman MJ, Am J Cardiol 1989
Malkawi AH et al. JET 2010
O'Rourke M et al. JACC Cardiovasc Imaging 2008



: root to the arch



Kilner PJ et al. Circulation 1993

Ascending Aorta

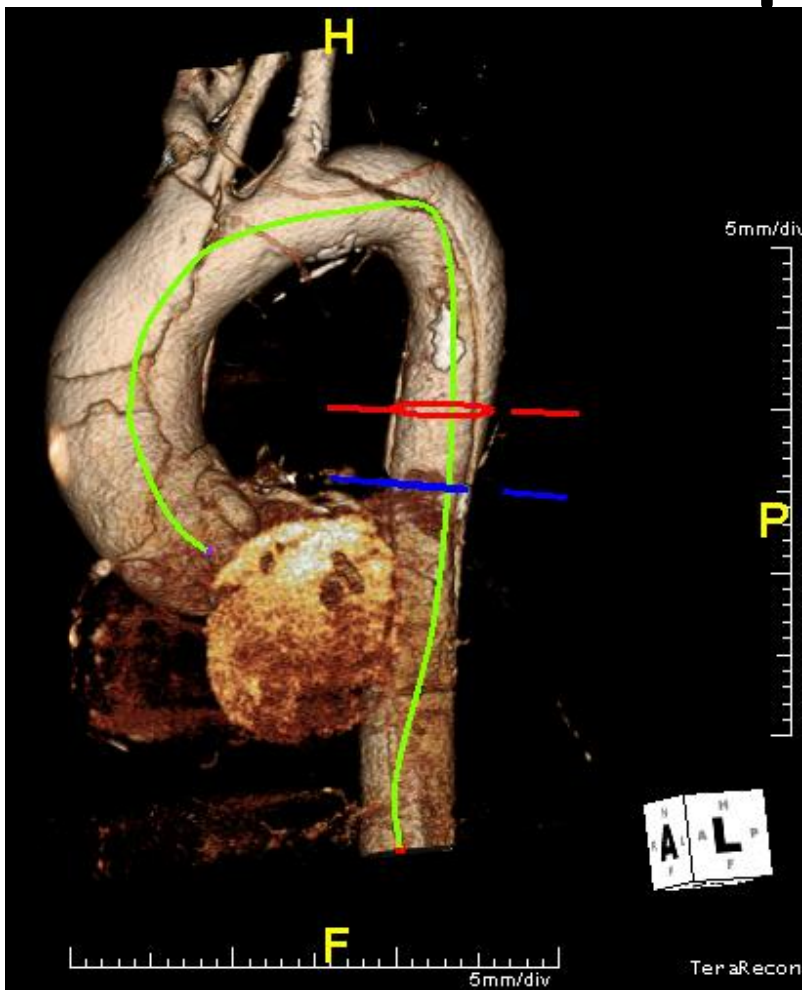
→Tricky area !

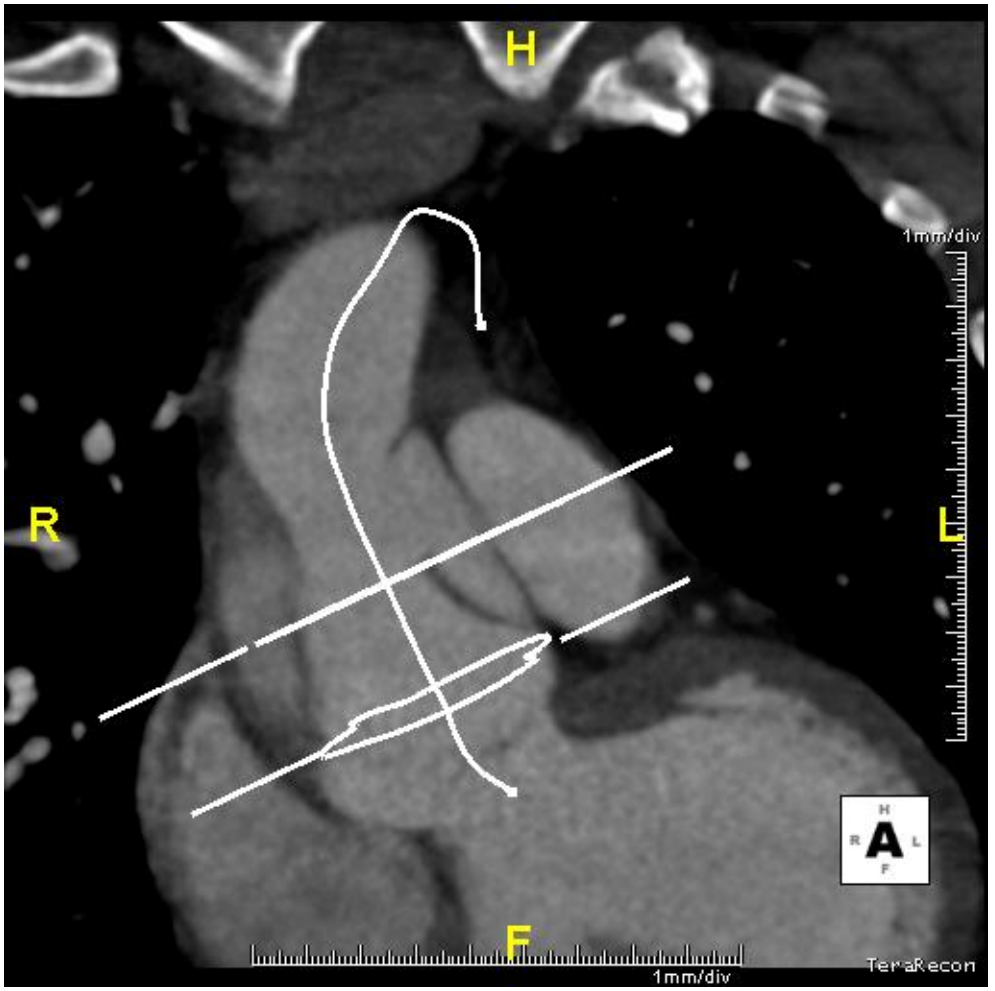
Supra-aortic Vessels

Curvature

Segment 0= Coronary arteries Aortic valve

Endovascular repair in thoracic aorta





What's our Objective ?

Eur J Vasc Endovasc Surg (2011) 42, 442–447

ELSEVIER

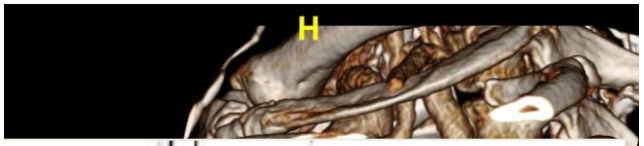
Endovascular Approaches to Acute Aortic Type A Dissection: A CT-Based Feasibility Study

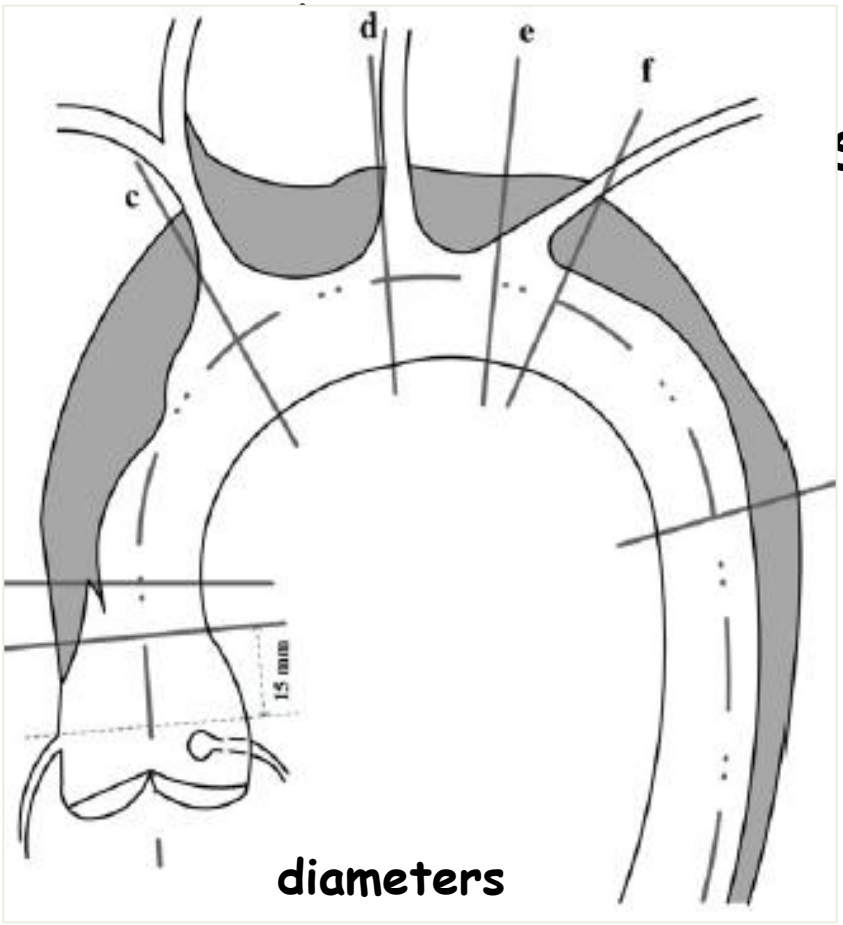
J. Sobocinski [a], N. O'Brien [a], B. Maurel [b], M. Bartoli [c], Y. Goueffic [d], T. Sassard [e], M. Midulla [f], M. Koussa [a], A. Vincentelli [a], S. Haulon [a,*]

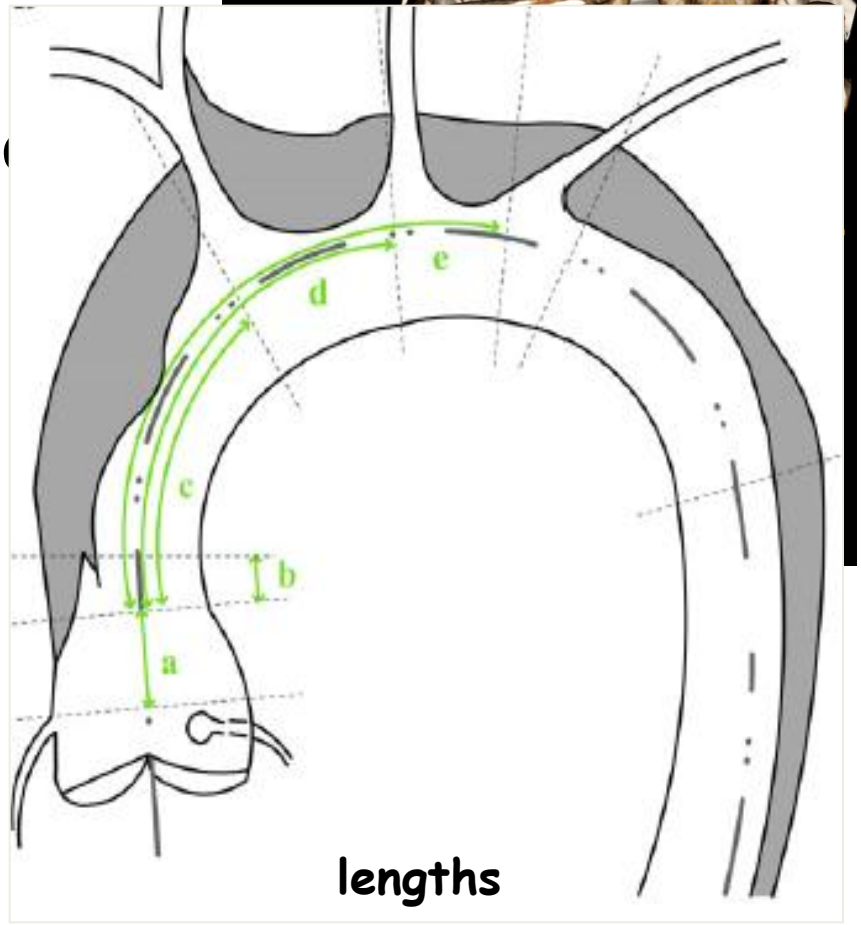
Sobocinski J et al. *EJEVS* 2011

Methods

- Acute (Stanford) type A
-
-







Sobocinski J et al. EJEVS 2011

Criteria for EVAR?

- **Proximal landing zone:**
  - Length from ET ≥ 20mm
  - True Lumen diameter ≤ 38 mm
  & Total Aortic diameter ≤ 46 mm
- **Distal landing zone:**
  - Length from distal part of ET ≥ 20 mm (LCC)
  - True Lumen diameter ≤ 38 mm
  & Total Aortic diameter ≤ 46 mm
- **Aortic Valve regurgitation (< Grade 3)**
- **Suitable iliac access**

EVAR suitability Results

Tubular endograft	34% (n=33)
Tubular endograft + Intercarotid bypass	41% (n=40)
Branched endograft ± intercarotid bypass	54% (n=53)
Branched & valved endograft	57% (n=56)

Computed tomography-based anatomic characterization of proximal aortic dissection with consideration for endovascular candidacy

Michael C. Moon, MD,[a] Roy K. Greenberg, MD,[a,b] Jose P. Morales, MD,[b] Zenia Martin, MD,[b] Qingsheng Lu, MD,[b] Joseph F. Dowdall, MD,[b] and Adrian V. Hernandez, MD, PhD,[c] *Cleveland, Ohio*

Background: Proximal aortic dissections are life-threatening conditions that require immediate surgical intervention to avert an untreated mortality rate that approaches 50% at 48 hours. Advances in computed tomography (CT) imaging techniques have permitted increased characterization of aortic dissection that are necessary to assess the design and applicability of new treatment paradigms.

Methods: All patients presenting during a 2-year period with acute proximal aortic dissections who underwent CT scanning were reviewed in an effort to establish a detailed assessment of their aortic anatomy. Imaging studies were assessed in an effort to document the location of the primary proximal fenestration, the proximal and distal extent of the dissection, and numerous morphologic measurements pertaining to the aortic valve, root, and ascending aorta to determine the potential for an endovascular exclusion of the ascending aorta.

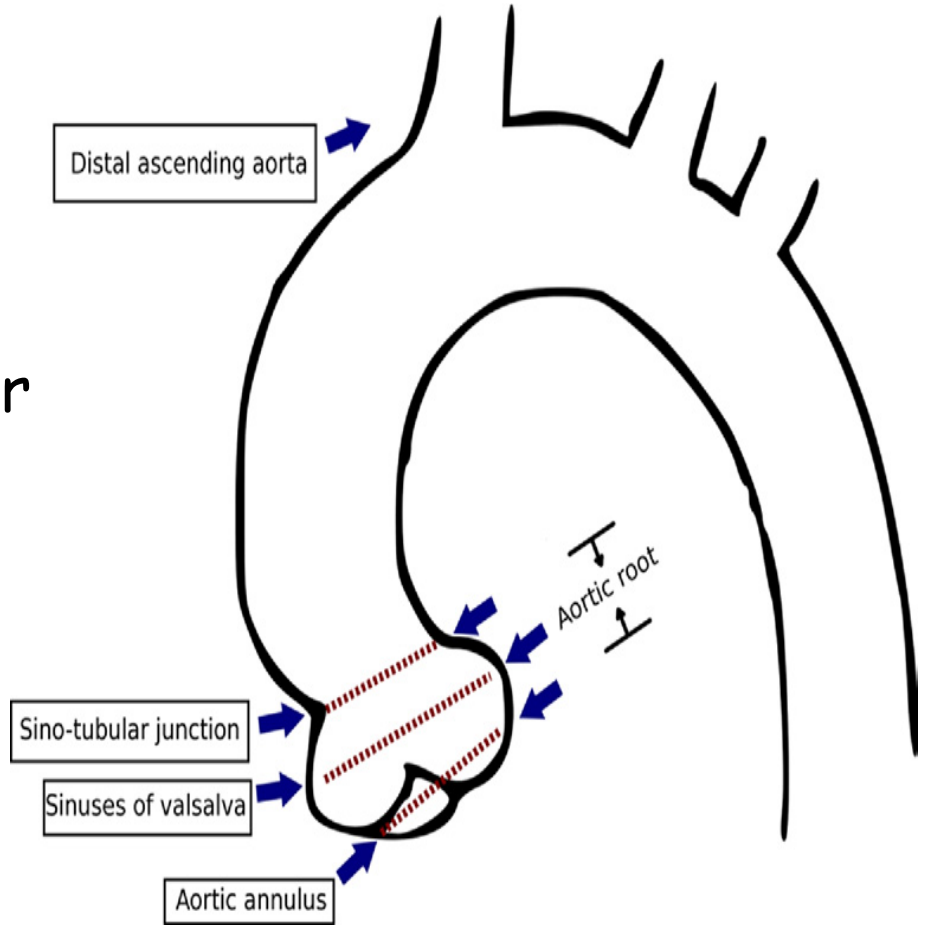
Results: During the study period, 162 patients presented with proximal aortic dissections. Digital high-resolution preoperative CT imaging was performed on 76 patients, and 59 scans (77%) were of adequate quality to allow assessment of anatomic suitability for treatment with an endograft. In all cases, the dissection plane was detectable, yet the primary intimal fenestration was identified in only 41% of the studies. Scans showed 24 patients (32%) appeared to be anatomically amenable to such a repair (absence of valvular involvement, appropriate length and diameter of proximal sealing regions, lack of need to occlude coronary vasculature). Of the 42 scans that were determined not to be favorable for endovascular repair, the most common exclusion finding was the absence of a proximal landing zone (n = 15; 36%).

Conclusions: Appropriately protocoled CT imaging provides detailed anatomic information about the aortic root and ascending aorta, allowing the assessment of which dissections have proximal fenestrations that may be amenable to an endovascular repair. (J Vasc Surg 2011;53:942-9.)

Moon MC et al. *JVS* 2011

Methods

- Sino-Tubular Junction (STJ) as the Zero point
- Distance from the intimal tear from the STJ
- Diameter at the STJ
- Maximal aortic diameter in the Asc Aorta

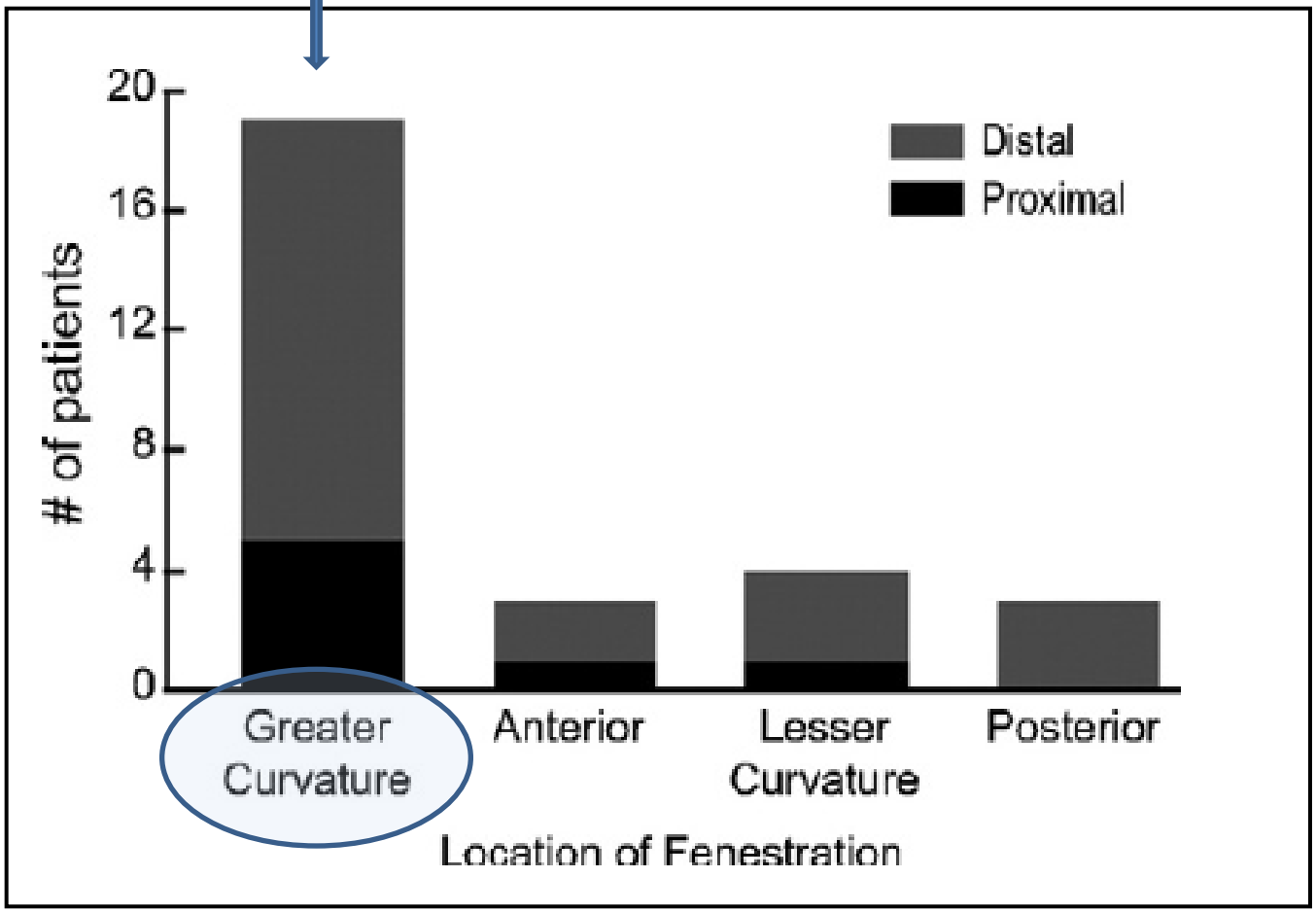


- **Proximal landing zone:**
  - Intimal fenestration distal to STJ
  - Length from intimal fenestration to STJ ≥ 10mm
  - True Lumen diameter at STJ ≤ 38 mm
  - Parallel aortic wall
- **Absence of coronary bypass originating from the asc aorta**

Criteria for EVAR?

EVAR suitability Results

35% Of 68 Ctscan


20
16
12
8
4
0
# of patients
Distal
Proximal
Greater Curvature
Anterior
Lesser Curvature
Posterior
Location of Fenestration

Patients, n=102	Median	Mean	Range	CCF (Mean)
Dissection length	496	373	20-699	
Proximal Entry Tear (ET) length (mm)	23	40	1-221	18±15
Distance from the lower coronary artery to the ET (mm)	23	28	0-128	
Distance from the lower coronary artery to the IT (mm)	84	84	40-130	82±25
Distance from the lower coronary artery to the LCC (mm)	99	99	0-148	
Distance from the ET to the IT (mm)	58	59	0-118	
Distance from the ET to the LCC (mm)	71	74	0-134	
IT length (mm)	35	35	14-64	

Patients, n=102	Median	Mean	Range	CCF
Entry tear diameter (mm):				
•True lumen (TL)	38	39	26-78	
15mm above the lower coronary diameters (mm):				
•TL	36	37	19-65	(Mean)
•External lumen	46	49	28-93	46 ± 18
Proximal IT aortic diameters (mm):				
•TL	35	35	23-49	
•External lumen	42	42	27-61	
Proximal LCC aortic diameters (mm):				
•TL	33	34	19-51	
•External lumen	38	39	25-57	
Proximal LSCA aortic diameters (mm):				
•TL	31	31	17-40	
•External lumen	34	35	23-52	
Distal LSCA aortic diameters (mm):				
•TL	27	27	20-35	
•External lumen	32	32	21-52	
Maximal diameters in the desc thoracic aorta (mm):				
•TL	26	26	12-39	
•External lumen	33	34	23-58	
Maximal diameters in the abdominal aorta (mm):				
•TL	17	18	12-25	
•External lumen	22	22	16-36	

Conclusion

…The ability to depict the configuration of intimal tears in cases of thoracic aortic dissection may alter therapeutic strategy…

Am J Roentgenol.
2012; 198:955

Intimal Tears in Thoracic Aortic Dissection: Appearance on MDCT With Virtual Angioscopy

Pierre D. Maldjian[1]
Luke Partyka

OBJECTIVE. The location, number, size, and configuration of intimal tears in aortic dissection have important therapeutic and prognostic implications. Planning of procedures to

Endo for > 1/3 of patients with type A AD