



The optimum management pathways for acute thoracic aortic pathology

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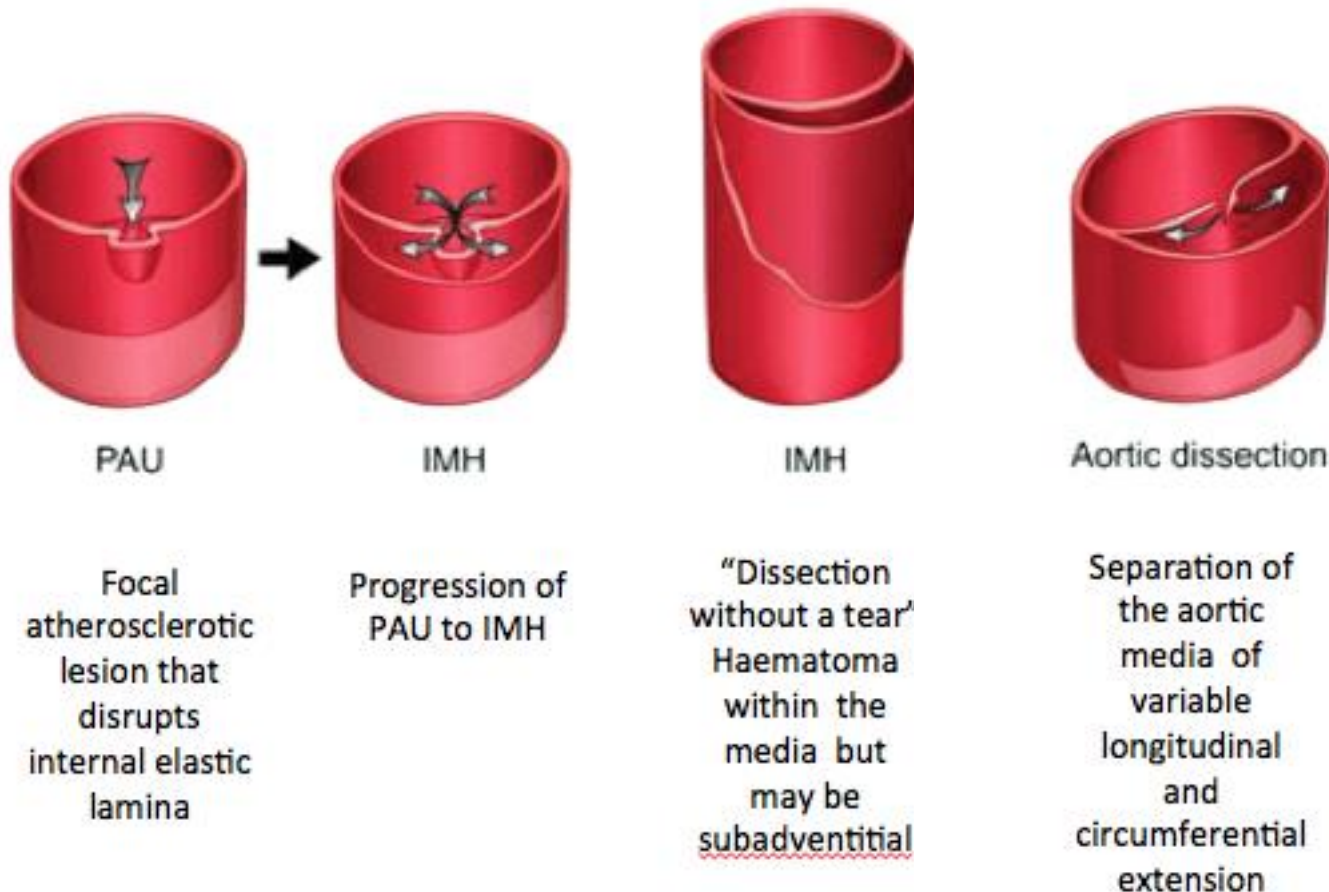
Acute Thoracic Aortic Syndrome

Class	Pathology
I	Classic Dissection
II	Intra-mural haematoma (IMH)
III	Subtle dissection
IV	Penetrating Aortic Ulcer (PAU)
V	Iatrogenic/Traumatic transection

Eggebrecht et al. Eur J Vasc Endovasc Surg. (2009) 38, 569-665

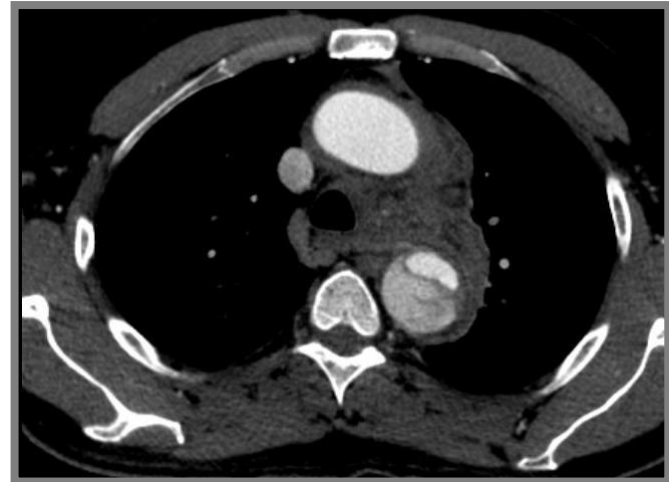
- Evolved as a concept as a result of advances in modern high-resolution imaging.
- Acute Aortic Syndrome Categorisation linked by:
 - Presentation
 - sudden chest/back pain
 - Common pathology
 - disruption of the medial layer of the aortic wall

AAS categorisation-Pathological



Diagnose, Stabilise and Transfer the “aortic attack”

- Immediate detailed high resolution cross-sectional imaging
- Diagnosis is still a challenge for some centres
 - Education
 - High index of suspicion
 - Serum Biomarkers in the future?
 - D Dimers
- Increasing importance on management in vascular unit high dependency care
- Immediate transfer for rupture
- In TBAD/IMH - Arterial line and strict BP modulation aiming for 100-120mmHg systolic

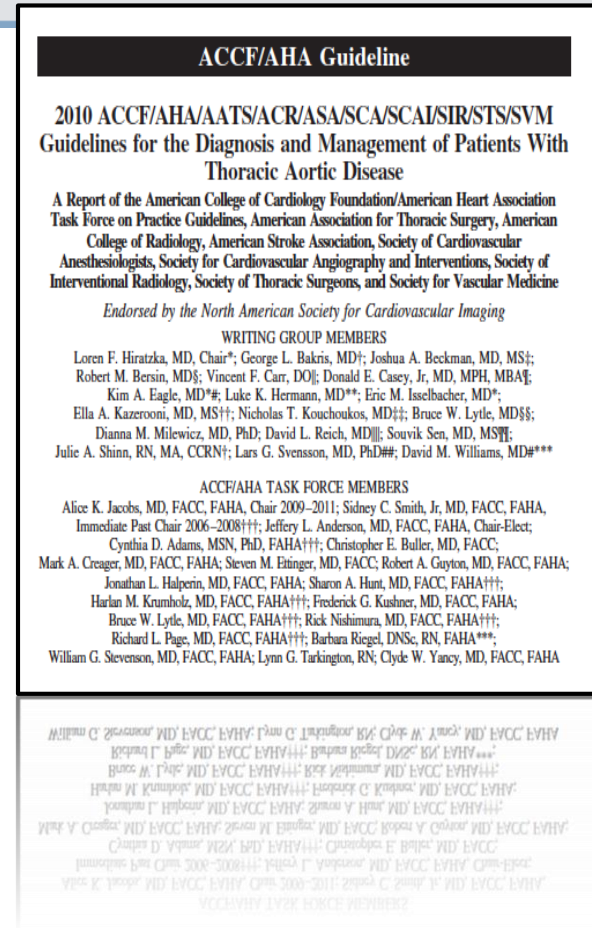


- Many unknowns but transfer appears to be safe in many cases
 - 52/56 survived transfer, range 4–211 miles, 30D mortality 16%



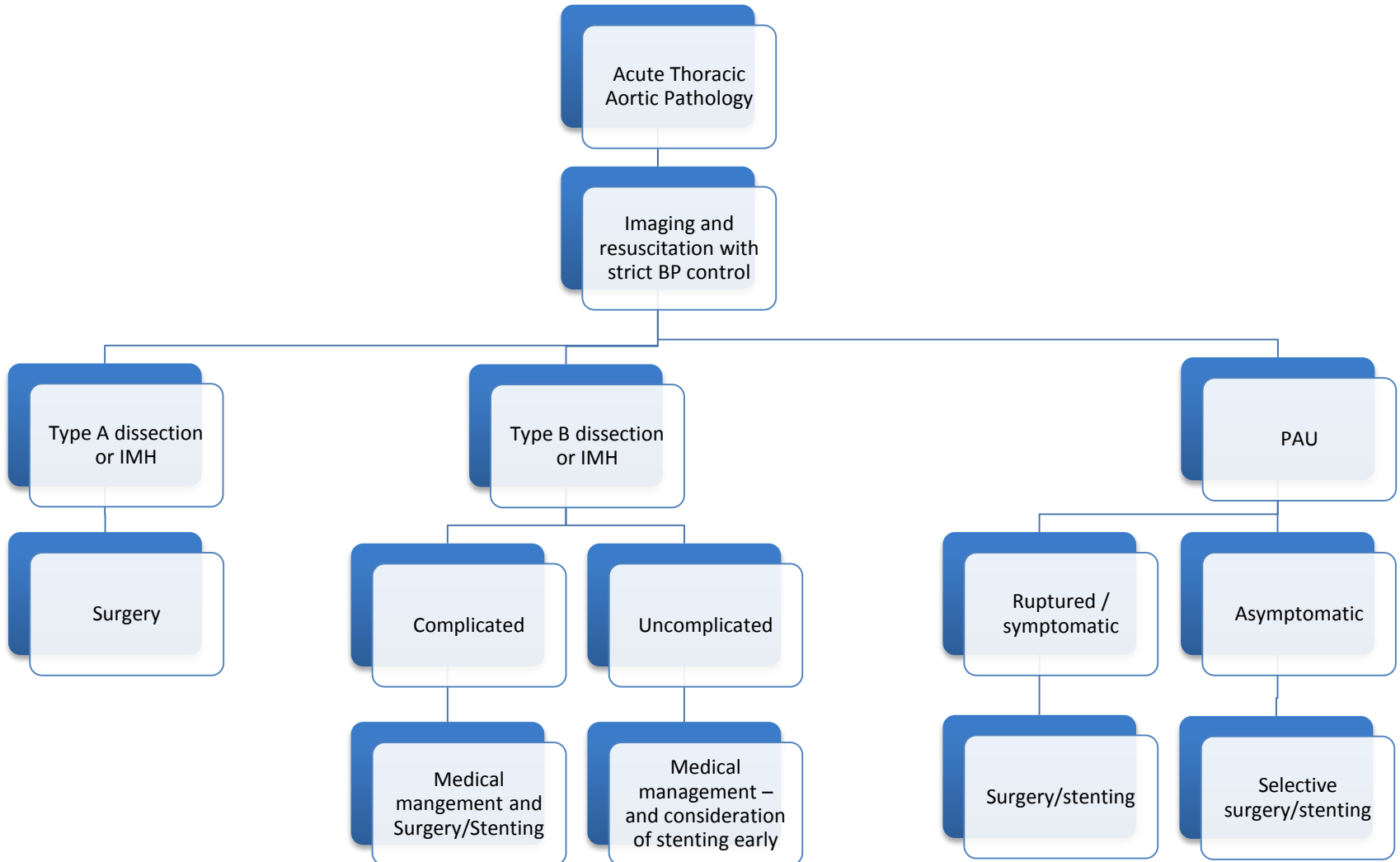
Guidelines for Best Medical Therapy

- High dependency, close observation
- Aggressive anti-impulse therapy is the cornerstone of management in the majority of patients with TBAD
- Guidelines recommend goal-directed therapy to achieve a heart rate of less than 60bpm and systolic pressure of 100-120mmHg; goals which may require a number of pharmacological agents to achieve
- Beta blockers generally recommended alongside further regimes to control BP
 - Labetalol
 - GTN
 - SNP

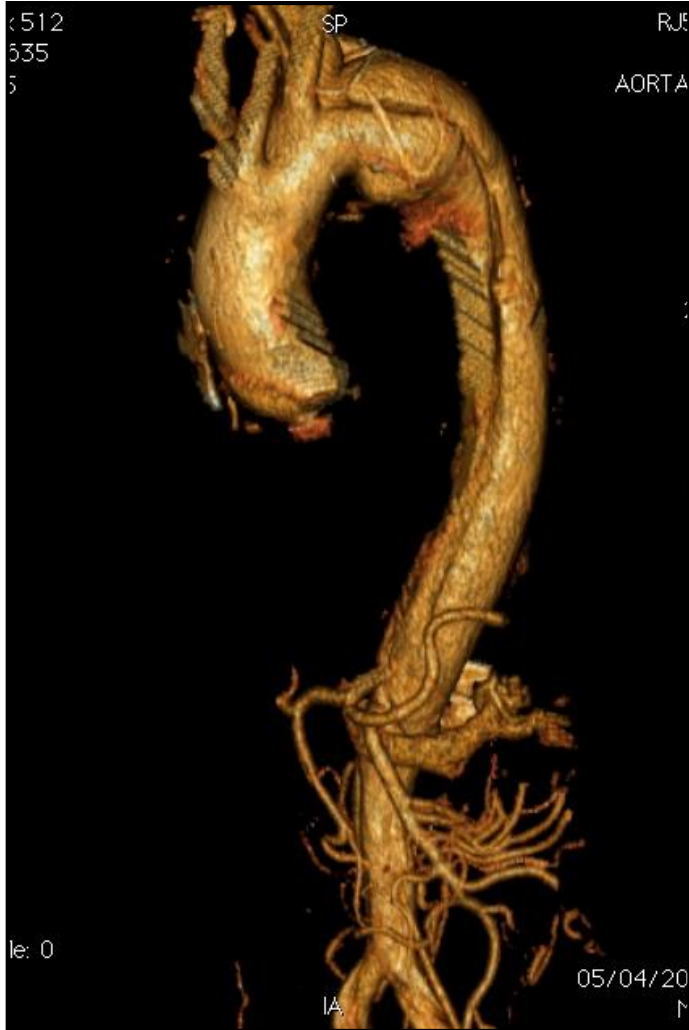
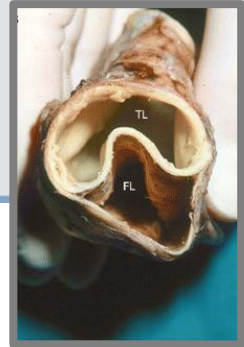


Hiratzka L, Bakris G, Beckman J, ... Williams D. 2010 ACCF/AHA/AATS/ACR/ASA/SCA/SCAI/SIR/STS/SVM guidelines for the diagnosis and management of patients with Thoracic Aortic Disease: a report of the American College of Cardiology Foundation/American Heart Association Task Force on Practice Guidelines, *A. Circulation*. 2010;121(13):e266-369.

Management Strategy - overview



Type B Acute Dissection – “complicated”

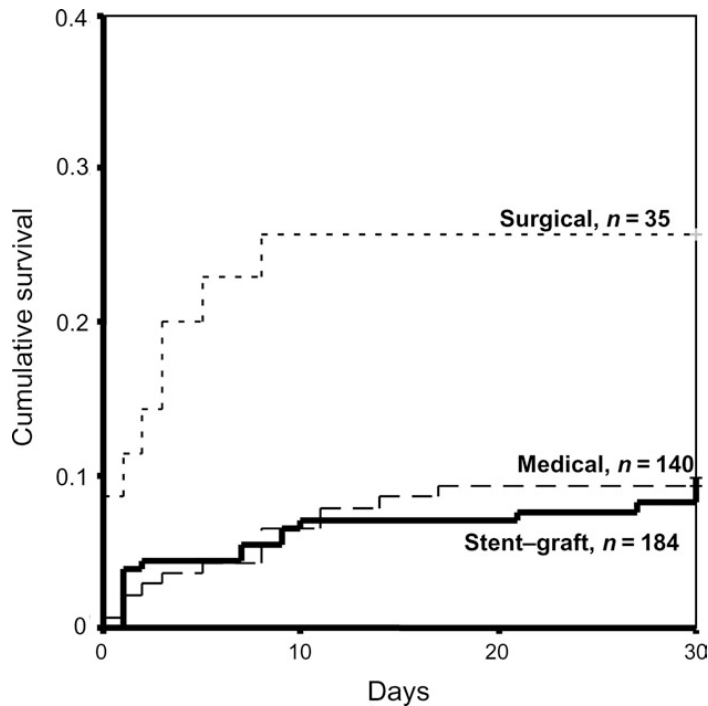
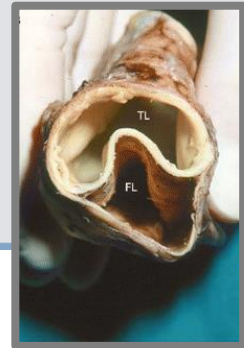


Indications for stenting:

- Rupture
- Malperfusion syndromes
- Acute dilatation
- Persistent pain or uncontrolled BP at three days (and those who go into ARF)



Stenting for type B dissection



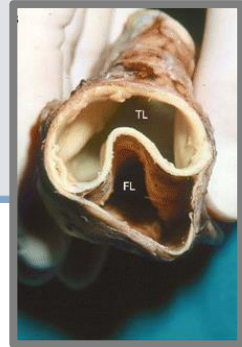
Engelbrecht et al, European Heart Journal 2006.

- A clear advantage to stenting in the acute phase compared to open surgical management
- Meta-analysis of contemporary series reported a pooled 30-day
 - Surgery
mortality of 19% (19% CI, 16.8-21.1%)
neurological complication rate of 9.8% (95% CI, 8.2-11.5%).
 - TEVAR
Mortality 7.3% (95% CI, 5.3-9.6%)
neurological complication rate 7.3% (95% CI, 5.2-9.7%).

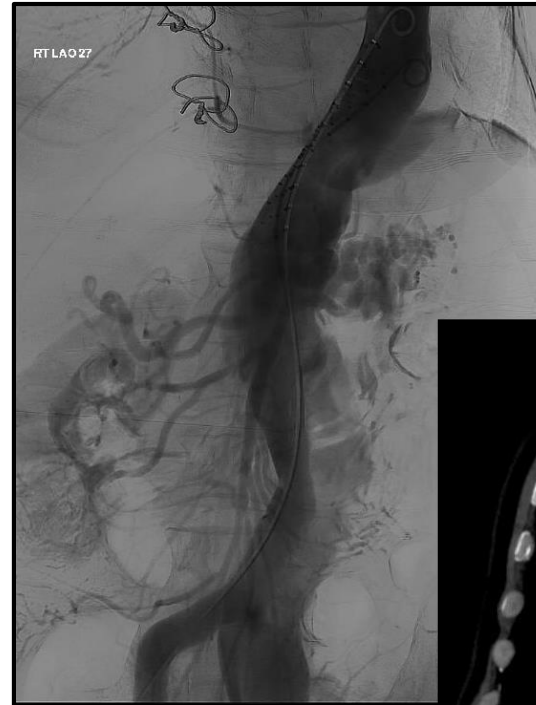
Moulakakis KG, Mylonas SN, Dalainas I, Kakisis J, Kotsis T, Liapis CD. Management of complicated and uncomplicated acute type B dissection. A systematic review and meta-analysis. *Ann Cardiothorac Surg* 2014;3(3):234e46.

- Open surgery is effective
 - mortality from bleeding and LHB/Circ arrest significant
 - mortality with ischaemic syndromes
- Fenestration, now rare practice.

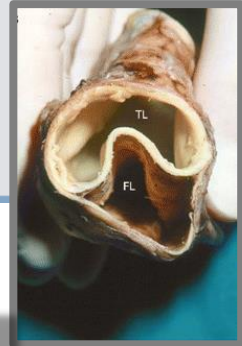
Stenting for type B dissection



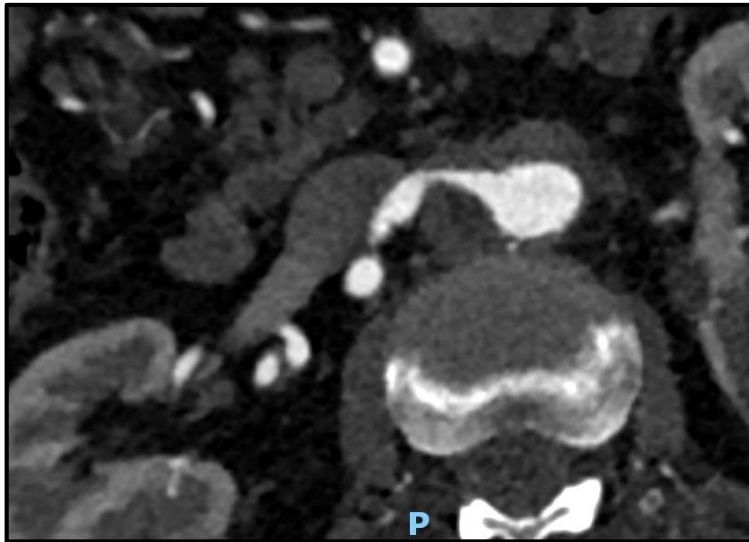
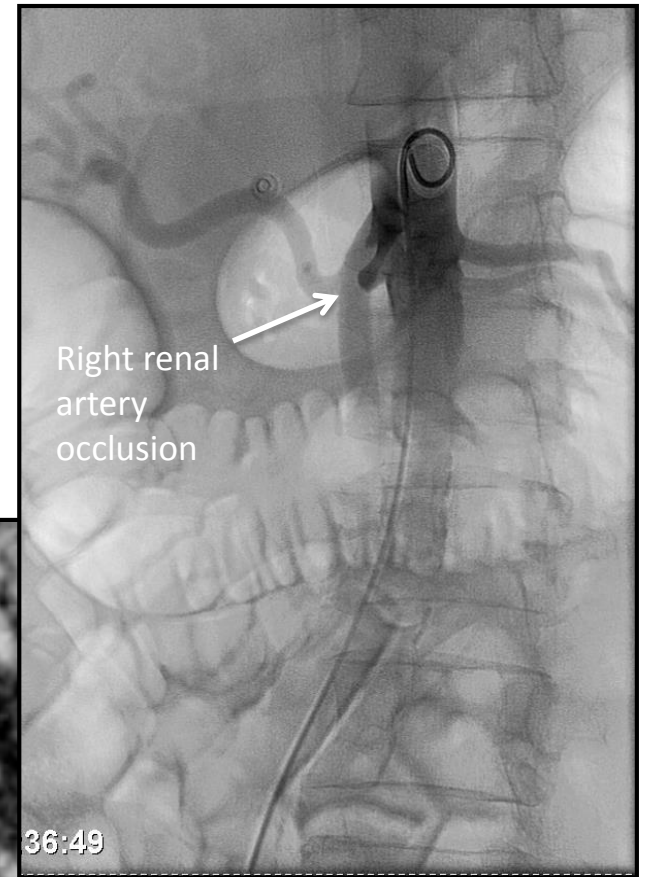
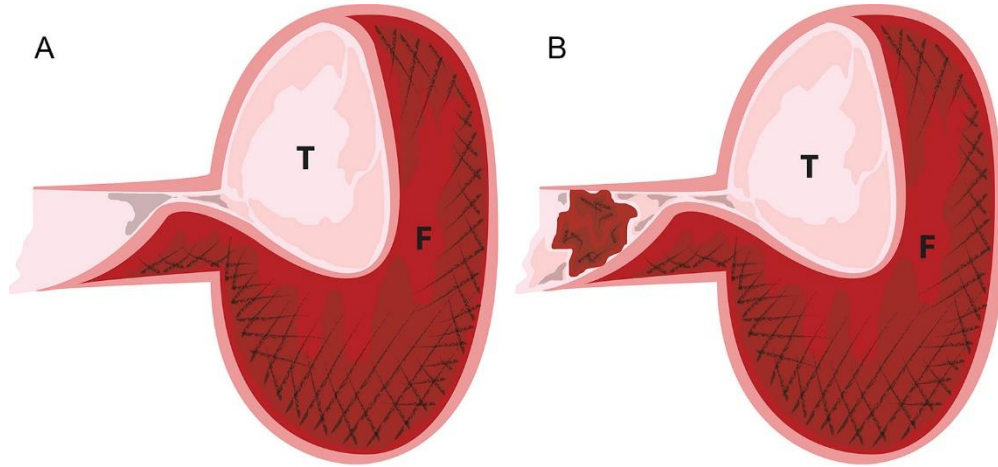
- From femoral...choose wisely
- Utilise LSCA wire and snare if necessary
- Ensure in true lumen with angiograms serially...do make sure you look at the imaging
- CO2 flushing
- Use a stent with no proximal bare stent
- Land 2cm proximal to the flap, cover subclavian, you don't have to revascularise the subclavian (MOTHER)
- Cover entry tear
- Stent to diaphragm
- Reassess on imaging and using central BP comparisons



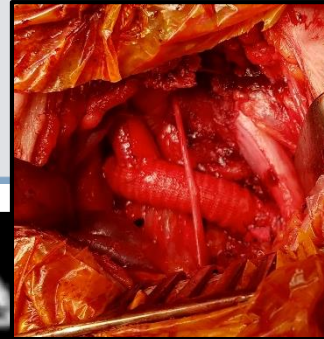
Stenting for type B dissection – continued malperfusion



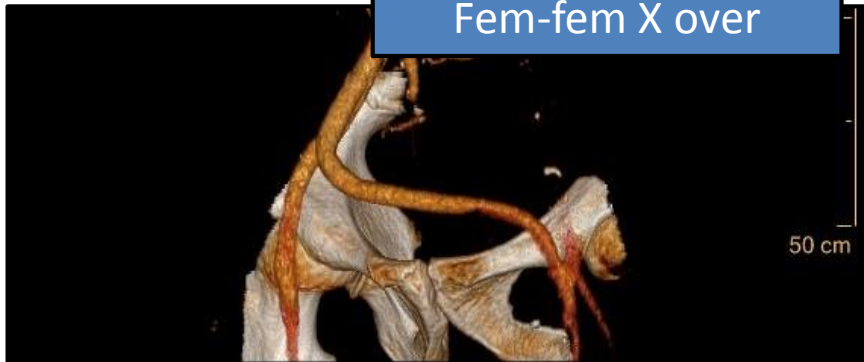
Static Visceral Artery Obstruction



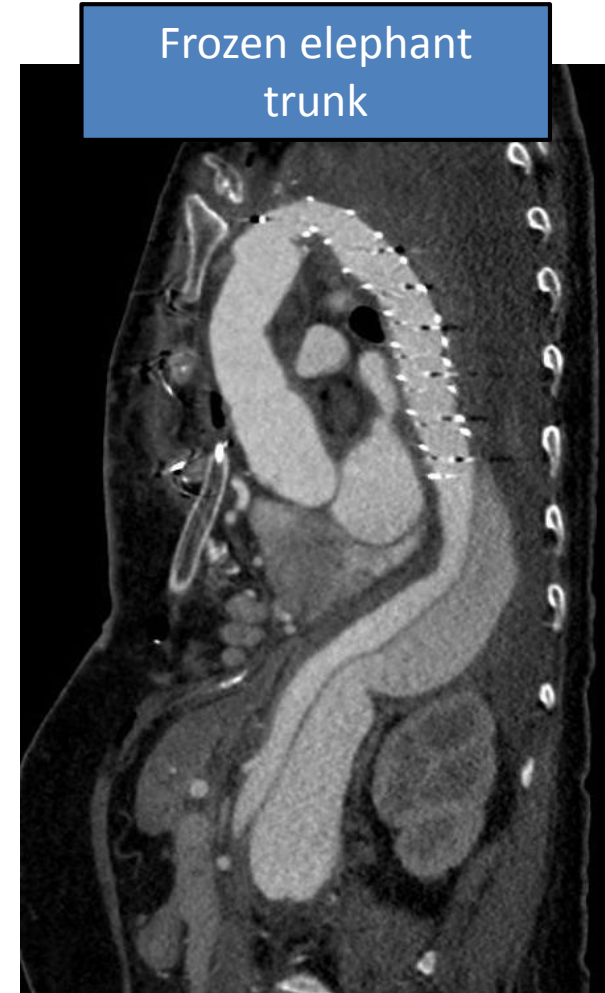
Surgical adjuncts



Hybrid grafts



Fem-fem X over



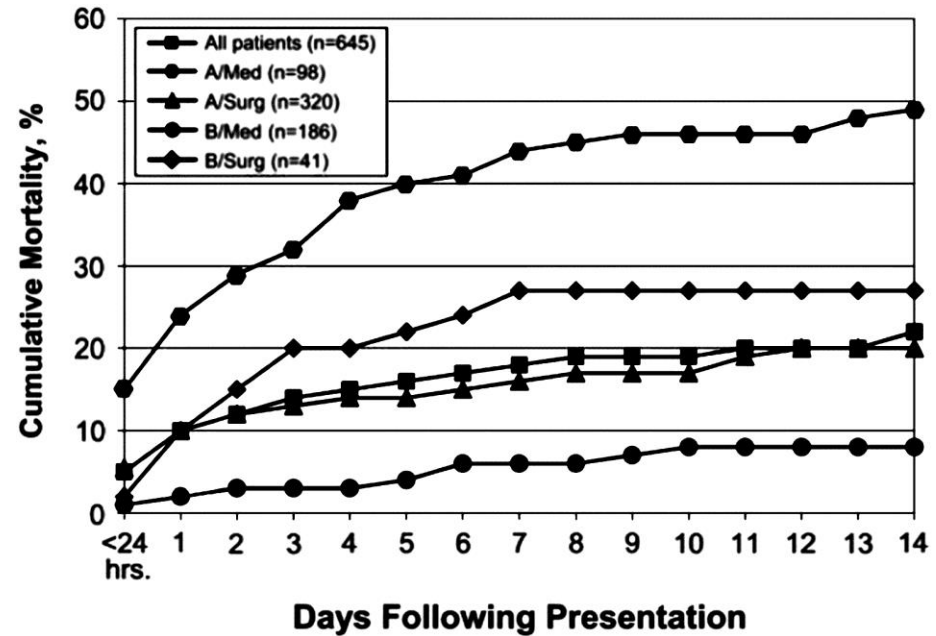
Frozen elephant trunk

Medical Management of dissection/IMH

- Closely observe
- BP control convert to oral, introduce one at a time
- Re CT scan at 48-72 hours
- Keep in for ten days

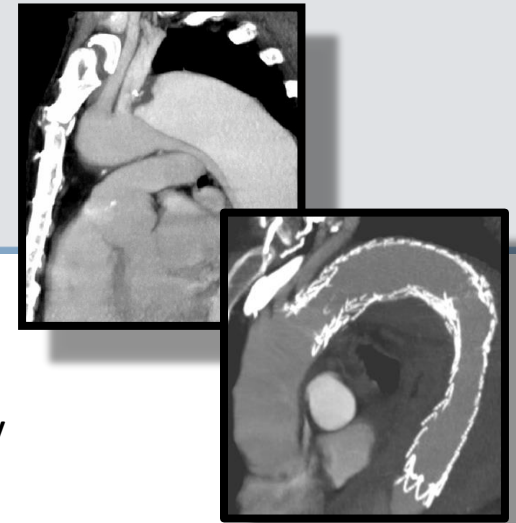
IMH specifically

- Do not stent early unless complicated
- Re CT again at 4 weeks
- Large proportion will remodel
- If they convert to dissection then consider as dissection

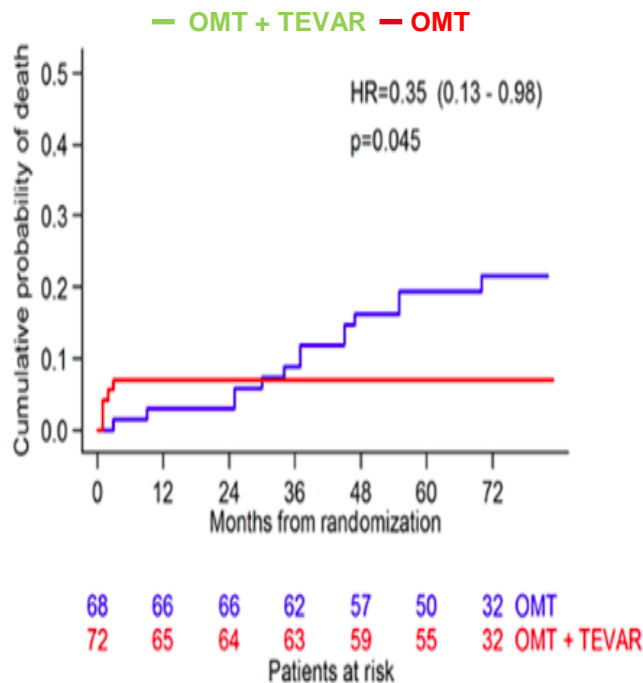


Hagan et al. JAMA (2000)283:897-903.

BEST MEDICAL THERAPY IN TBAD



- Patients receiving “best” medical therapy in chronic TBAD fare badly compared to those undergoing TEVAR
- ADSORB - Demonstrates low mortality in stable group at early stage with significant remodelling
- Leading to suggestions that TEVAR for uncomplicated dissection should be considered in all patients



- But, no evidence there is a difference in all cause mortality
- Poor evidence for “best” medical therapy
- Compliance in dissection patients is low



High Adherence (42.5%)

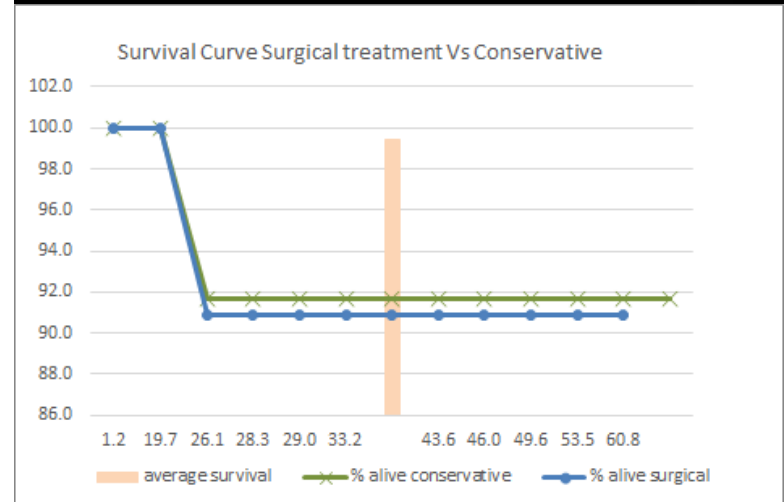
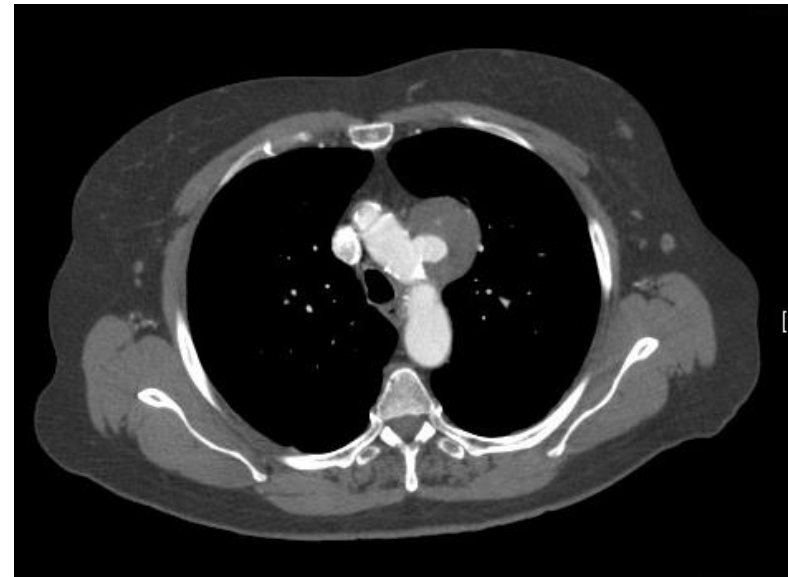
Medium Adherence (36.2%)

Low Adherence (21.3%)

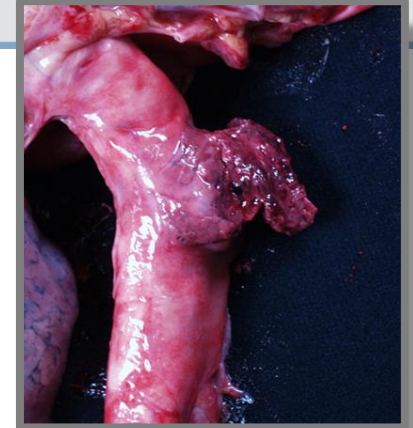
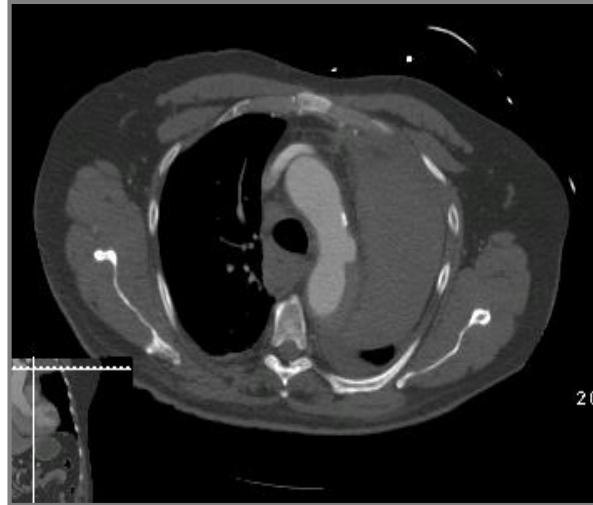
Penetrating aortic ulcer

- Rare as an isolated finding
- Indications for repair
 - Rupture
 - Symptomatic
 - Wide base or significant aneurysmal change
- Imperial five yr experience:
 - 25 PAU without IMH
 - 11 undergoing endovascular repair
 - No aortic related deaths in the surveillance group

Locci R, Martin G, Salim S

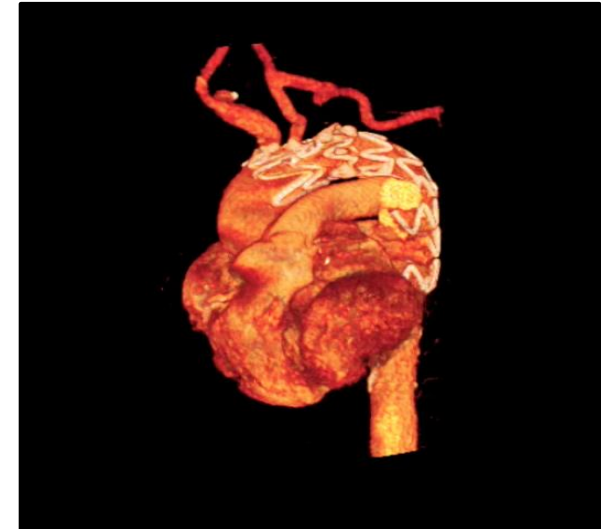


PAU –often adjacent to the LSCA



Endovascular if possible

It has ulcerated and ruptured because the tissue is weak and damaged and not good quality for sewing



PAU in the aortic arch



SINGLE CHIMNEY FOR LANDING IN ZONE ZERO

Consider in:

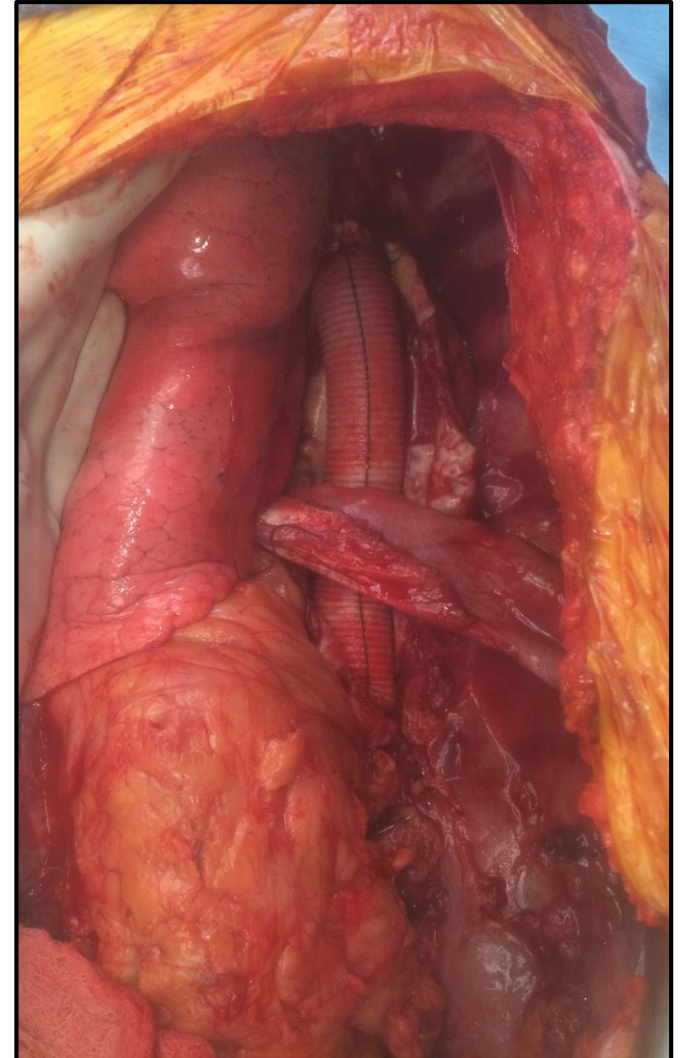
- Emergency
- Hostile chest
- Turned down for open

Useful but....

Make sure it seals!

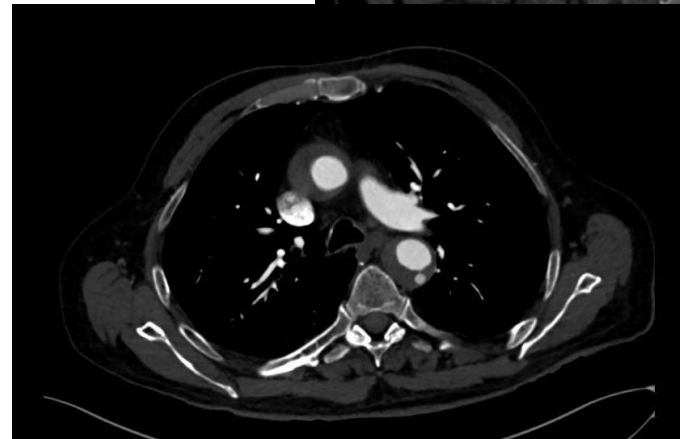
Open surgical management

- Selected cases - infected or unsuitable for endovascular approach
- Planning and set up important
- Left Heart Bypass or Axillo-femoral shunt
- Thoracoabdominal incision
- Clamp proximal, and serially if possible
- Once visceral segment open selective perfusion of viscera
- Carrell patch/branched stag graft if necessary

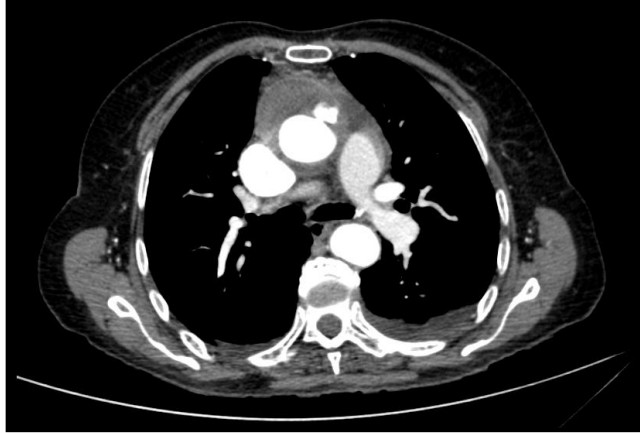


The Ascending aorta - Type A Dissection

- Traditionally an open surgical approach
- Replacement of ascending aorta +/- arch
 - Type A dissection and DeBakey I and II
 - IMH extending over the arch into ascending aorta
- For IMH into but limited in the arch there is a case for conservative management (in a cardiac unit)

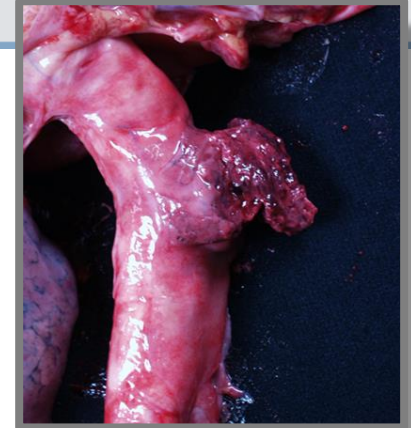
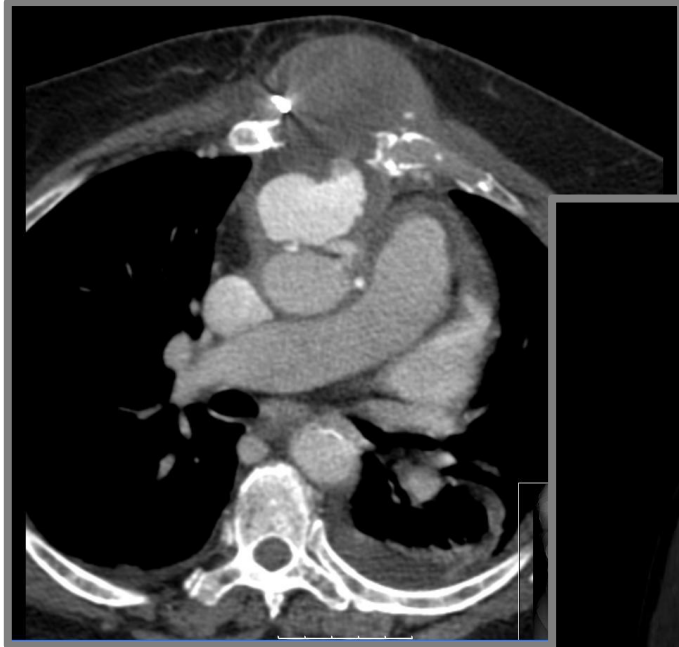


Stenting acute type A dissection



J Vasc Surg 2012;55:220-2

Stenting acute PAU in ascending aorta



Conclusions

- Evolving understanding of the conditions that make up this set of syndromes
- Diagnostics important and clinical care pathways similar to MI need to exist
- Best medical therapy for all
- Understanding of risk/benefit of stenting (uncomplicated dissection) is needed
- Technology improvement leading to extension of minimally invasive strategies, open surgery is important but is not first line