Lessons Learnt From Early Experiences on TEVAR for Ascending Aortic Pathologies

Ian Loftus
St George’s
London UK
Endovascular Revolution

• Now >80% of aortic surgery endovascular
• Proven better results than open surgery
  – Abdominal
  – Thoraco-abdominal
  – Thoracic
• Questions remain
  – Long term durability
  – Cost-effectiveness
  – Ascending aorta/arch
Ascending Aorta/Arch Challenges

- Branches: coronary and arch vessels
- Minimal landing zones
- Risk of trauma to aortic valve/heart
- Angles of the arch: conformability
- Haemodynamic forces:
  - Deployment accuracy/durability
- Access problems
Hybrid Techniques
Fenestrated/Chimney solutions
Innominate Branch/Hybrid Solution
Arch Aneurysm
Innominate Branch/Hybrid Solution
Acute Type A Aortic Dissection

- 2/3 aortic dissections: ascending aorta
- Mortality: 1-2%/hour
- Conservative mortality >60%
- Limited data on patients not in cardiothoracic units

Acute Type A Aortic Dissection

- Surgical mortality 16-28%
- Non surgical candidates: ~40%
  - IRAD: 28%
- Over 80: mortality >35%
- 25% surgical re-intervention

Ascending Aortic Grafts

- 28-46mm diameter
- Short flexible graft
- Long delivery device, soft flexible tip
- Not approved for commercial use
Lessons: Anatomical Suitability

• 102 consecutive patients with acute Type A
  – Median distance 1º tear- coronary 23mm (0-128)
  – Median diameter true/total lumen at tear 38/46mm
  – Length ascending aorta 84mm (40-130)
  – Endovascular repair feasible in 37/102, plus a further 8/13 with bypass/branched device

• 76 consecutive high resolution CT for type A
  – Entry tear visible in 41%
  – 32% suitable for endovascular repair
  – Most common exclusion: no proximal landing zone

Sobocinski; EJVES 2011;42:442-7
Lessons: *Anatomical Suitability*

- 102 consecutive patients with acute Type A
  - Median distance $1^\circ$ tear- coronary 23mm (0-128)
  - Median diameter true/total lumen at tear 38/46mm
  - Length ascending aorta 84mm (40-130)
  - *Endovascular repair feasible in 37/102, plus a further 8/13 with bypass/branched device*

- 76 consecutive high resolution CT for type A
  - Entry tear visible in 41%
  - 32% suitable for endovascular repair
  - Most common exclusion: no proximal landing zone

Moon; JVS 2011;53:942-9
Lessons: Imaging
Lessons: Access Challenges
Lessons: Access Challenges

• Risk of stroke and vessel trauma
• Consider access vessel calibre, disease, tortuosity
• Length of delivery device from groin
• From supra-aortic vessels
  – need cerebral monitoring/protection
  – shunt/temporary bypass
• ?trans-apical approach
Lessons: Valvular/Ventricular Trauma
Lessons: Control of Cardiac Output
Endoluminal and surgical treatment for the management of Stanford Type A aortic dissection

Hongkun Zhang*, Ming Li, Wei Jin, Zhongao Wang

Department of Vascular Surgery, The First Affiliated Hospital of Medical Science, Zhejiang University, No. 79 Qing Chun road, HangZhou 310003, China

Endovascular Stent-graft Treatment of Type A Dissection: Case Report and Review of Literature

S. Senay,1* C. Alhan,1 F. Toraman,1 H. Karabulut,1 S. Dagdelen2 and H. Cagii3

Departments of Cardiovascular Surgery, 2Cardiology, and 3Radiology, Acibadem Kadikoy Hospital, Istanbul, Turkey
Results of Ascending Endografts

• 45 cases of Type A dissection
  – Entry tear in ascending aorta in 10 cases
• All had CTA, MRA, Angio and Echo
• Repair with standard endografts or cuffs
• Selected bypasses to allow landing zones
• Technical success 44/45
• 30 day mortality 3/45
Results of Ascending Endografts

• But selected group of patients:
  – Age 51 (38-79)
  – All had dissection duration >3 days (range 3-73)
  – A further 79 underwent open surgery and 42 no intervention

• 10 cases with ascending aortic tear
  – 2 deaths 1<30 days, 1 >30 days
  – 1 type 1 endoleak
  – 1 false aneurysm
  – 2 CVA (3 weeks and 1 year)

Ye; EJVES 2011;42:787-94
Summary

• With current technology we are a long way from an solution for the ascending aorta
• Endovascular repair should still be considered experimental and high risk
• Small proportion of patients suitable
• Very specific challenges posed may require very different solutions
  – Branches and ? valve replacement