Asterios Katsamouris Lecture

“The Dying Art of Open Surgery”

Mike Wyatt
Treasurer & Executive BJS Society
Past President Vascular Society of Great Britain and Ireland
Professor Asterios Katsamouris

Professor of Vascular Surgery
Aristotle University of Thessaloniki
Greece
1947-2014

“Died at Arnaia Chalkidiki on 19 July 2014, after suffering a fatal myocardial infarction”
Gold Standard – Open repair
Current Position – Aortic Stent Grafting

Is this evidence based?
Modern Open Aortic Surgery

• Knitted dacron grafts
Conventional Repair

- Left Ureter
- Infrarenal Aorta
- Inferior Mesenteric Artery
- Aneurysm sac
Results of Open AAA Repair

Effective and Durable

\[\text{BUT...}\]

- 5% mortality
- 15% significant morbidity; higher in elderly patients with co-morbidity
- Recovery up to 2-3 months
- High risk patients often denied repair
'Concern' as study highlights aneurysm death rate

By James Gallagher
Health and science reporter, BBC News website

© 24 November 2016 | Health

The death rate from abdominal aortic aneurysms is more than three times higher in England than in the US, analysis of official data shows.
Minimally Invasive Era

- Endo
- Vascular
- Aortic
- Repair
Late 1980’s/1990s

- Juan Carlos Parodi
- Julio Palmaz
- Catheter-mounted, balloon-expandable system
- Intraluminal bypass of AAA (exclusion)
Third Generation Stent Grafts

- Cook Zenith LP
- Cordis Incraft
- Trivascular Ovation
research (noun) 1 the systematic study of materials
Newcastle Experience

• Since December 1995

• 1100 EVAR
  * 947 abdominal
  * 161 thoracic

• 303 re-interventions in 212 patients (19%)
Follow up

• All patients receive 1 month CT/XRAY

• CT/US/XRAY yearly

• Early intervention for the “failing EVAR”

• Rupture rate 10/1110 = 0.9% (despite aggressive FU)
Problems

• Disease progression (aortic neck/iliac enlargement)
• Limb kinking/occlusion
• Limb/leg problems
• Graft disintegration
• Endoleaks
• Rupture
Vanguard at 19 years
94y old lady
Results of initial trials were promising!

Open repair

Endovascular repair
Late results

EVAR is **NO** better than Open Repair at 10 years!
Endovascular versus open repair of abdominal aortic aneurysm in 15-years’ follow-up of the UK endovascular aneurysm repair trial 1 (EVAR trial 1): a randomised controlled trial

Rajesh Patel, Michael J Sweeting, Janet T Powell, Roger M Greenhalgh, for the EVAR trial investigators

EVAR (v Open Repair)

- early survival benefit
- inferior late survival
- Lifelong surveillance and re-intervention
EVAR 1 trial 15-year follow-up published: Lifelong surveillance of EVAR and prompt reintervention are paramount

Fifteen-year follow-up results of the UK endovascular aneurysm repair trial 1 (EVAR 1), published online in The Lancet on 12 October 2016, show higher rates of aneurysm-related and total mortality during the last eight years of follow-up for patients who had EVAR than those who had open repair. However, over the whole follow-up of the trial the mean total and aneurysm-related mortality rates were not significantly different between groups. The investigators note that “the significant late divergence of the survival curves in favour of open repair can be partly explained through greater increase in late mortality from aneurysm-related deaths in the EVAR group”. They add that the loss of early EVAR survival benefit, followed by inferior late survival benefit and durability compared with open repair, needs to be addressed by lifelong surveillance of EVAR and prompt reintervention if necessary. The 15-year results were first presented at the Charing Cross Symposium in April 2016.

“Durability after EVAR remains a major issue”
Select, select, select….. or “pick winners”

- Only place EVAR under IFU
- Not all AAAs need EVAR
- Consider fenestrated EVAR
- Consider open repair
- If it’s not going to work – don’t do it!
Result - Complex EVAR developing
Branched and Fenestrated Technology
Cook Zenith p-Branch Device
“off the shelf”
Current Practice

• Number of EVAR / BEVAR / FEVAR increasing despite evidence of medium/long-term stent graft failure

• Number of Open AAA repairs continuing to fall

• Implications to:
  • Training
  • Patients
  • Health Care Budgets
<table>
<thead>
<tr>
<th>Cases</th>
<th>Numbers</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>bEVAR/ fEVAR (Complex)</td>
<td>123</td>
<td>20%</td>
</tr>
<tr>
<td>EVAR</td>
<td>220</td>
<td>36%</td>
</tr>
<tr>
<td>Open infra-renal</td>
<td>263</td>
<td>44%</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>606</strong></td>
<td></td>
</tr>
<tr>
<td>Open AAA per year</td>
<td>44</td>
<td></td>
</tr>
<tr>
<td>Open AAA per trainee each year</td>
<td>7</td>
<td></td>
</tr>
</tbody>
</table>
AAA Audit in UK

- 2016
- 4153 elective repairs
  - Only 30% open
- Complex AAA (2014-16)
  - 2055
  - Only 10% open
National Vascular Registry cases 2017

- Total infrarenal AAA = 2139
  - EVAR = 1454 (68%)
  - Open = 685 (32%)

- Average no open AAA per unit = 8.8

- Average number per registrar = 1.46
Low open surgery rates = low mortality

<table>
<thead>
<tr>
<th>Hospital</th>
<th>AAA number</th>
<th>EVAR</th>
<th>Open</th>
<th>% Open</th>
<th>Adjusted in hospital mortality</th>
</tr>
</thead>
<tbody>
<tr>
<td>Guy’s and St Thomas’</td>
<td>127</td>
<td>105</td>
<td>22</td>
<td>17</td>
<td>0.6%</td>
</tr>
<tr>
<td>Belfast</td>
<td>124</td>
<td>77</td>
<td>47</td>
<td>40</td>
<td>1.9%</td>
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<tr>
<td>Cambridge</td>
<td>118</td>
<td>96</td>
<td>22</td>
<td>19</td>
<td>0.6%</td>
</tr>
<tr>
<td>University Hospital of North Midlands</td>
<td>117</td>
<td>66</td>
<td>51</td>
<td>44</td>
<td>1.9%</td>
</tr>
<tr>
<td>Norfolk and Norwich</td>
<td>108</td>
<td>66</td>
<td>42</td>
<td>39</td>
<td>0.6%</td>
</tr>
<tr>
<td>Chester</td>
<td>103</td>
<td>86</td>
<td>22</td>
<td>21</td>
<td>1.2%</td>
</tr>
<tr>
<td>Liverpool</td>
<td>100</td>
<td>60</td>
<td>40</td>
<td>40</td>
<td>1.8%</td>
</tr>
<tr>
<td>Newcastle</td>
<td>92</td>
<td>48</td>
<td>44</td>
<td>48</td>
<td>1.0%</td>
</tr>
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</table>
Some centres – Zero mortality but virtually no open AAA surgery

<table>
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<tr>
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<th>EVAR</th>
<th>Open</th>
<th>% Open</th>
<th>Adjusted in hospital mortality</th>
</tr>
</thead>
<tbody>
<tr>
<td>St George’s</td>
<td>85</td>
<td>85</td>
<td>0</td>
<td>0</td>
<td>0</td>
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<tr>
<td>Basildon (Essex)</td>
<td>38</td>
<td>38</td>
<td>0</td>
<td>0</td>
<td>0</td>
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<tr>
<td>Sunderland</td>
<td>36</td>
<td>32</td>
<td>4</td>
<td>11</td>
<td>0</td>
</tr>
<tr>
<td>Medway (KENT)</td>
<td>32</td>
<td>30</td>
<td>2</td>
<td>6</td>
<td>0</td>
</tr>
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</table>
Sweden

Treatment of aortic aneurysms registered in Swedvasc

Development reflected in a national vascular registry with an almost 100% coverage

2016 – 63% EVAR
Germany 2007

“The endovascular adoption rate of well-equipped referral centers in Germany ranges between 70% and 80%.”
Current status of AAA repair

- Open surgery AAA rates are falling
- Trainees struggling to maintain competencies
- Considerable concern for future.
“Multidisciplinary committee looks at current clinical, cost effective and QoL evidence and develops their recommendations”

Currently out to consultation and final report will be published in 2019
Recommendations:

• DO NOT offer EVAR to patients with unruptured infrarenal AAA if open is suitable (+/- unfit)

• DO NOT offer complex EVAR to people with unruptured AAA if open repair is a suitable option (+/- unfit)

• CONSIDER EVAR for patients with ruptured AAA
Evidence Based Medicine

• Do you believe in Evidence Based Medicine?

• Do you think cost is important in determining treatment choices?

• Guidelines not yet published!
The Society for Vascular Surgery practice guidelines on the care of patients with an abdominal aortic aneurysm

Elliot L. Chaikof, MD, PhD,a Ronald L. Dalman, MD,b Mark K. Eskandari, MD,c Benjamin M. Jackson, MD,d W. Anthony Lee, MD,e M. Ashraf Mansour, MD,f Tara M. Mastracci, MD,g Matthew Mell, MD,h M. Hassan Murad, MD, MPH,i Louis L. Nguyen, MD, MBA, MPH,j Gustavo S. Oderich, MD,k Madhukar S. Patel, MD, MBA, ScM,l,m Marc L. Schermerhorn, MD, MPH,a and Benjamin W. Starnes, MD,l
Boston, Mass; Palo Alto, Calif; Chicago, Ill; Philadelphia, Pa; Boca Raton, Fla; Grand Rapids, Mich; London, United Kingdom; Rochester, Minn; and Seattle, Wash

Whereas cost-effectiveness results can vary among different populations of patients and health care systems and over time, the factors that influence cost and outcomes remain consistent. In a future of rising costs and constrained resources, cost-effectiveness analysis will provide a basis to guide health care policy that sustains health care coverage for all.
Conclusions

• Open aortic surgery is a dying art

• Huge implications for training our surgeons of the future

• The endovascular revolution is continuing

• BUT: COST EFFECTIVE and LONG TERM analysis may reverse this trend!
Ευχαριστώ