

**Abdominal Aortic Aneurysm**  
**A service in need of surgery?**

# The Role of Endovascular Repair

**John Rose**  
**Freeman Hospital**  
**Newcastle upon Tyne**



# The Role of Endovascular Repair

- **Endovascular technique**
- **Endovascular results**
- **NCEPOD study & conclusions**



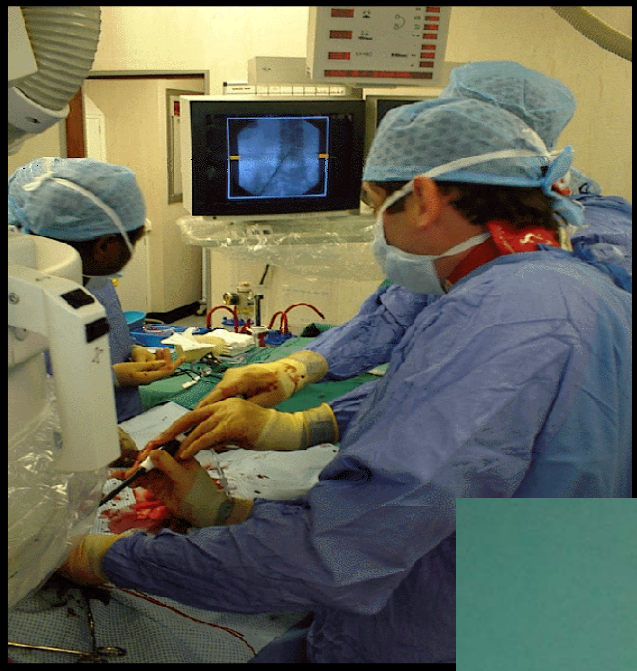
# Endovascular treatment for AAA

## Transfemoral Intraluminal Graft Implantation For Abdominal Aortic Aneurysm

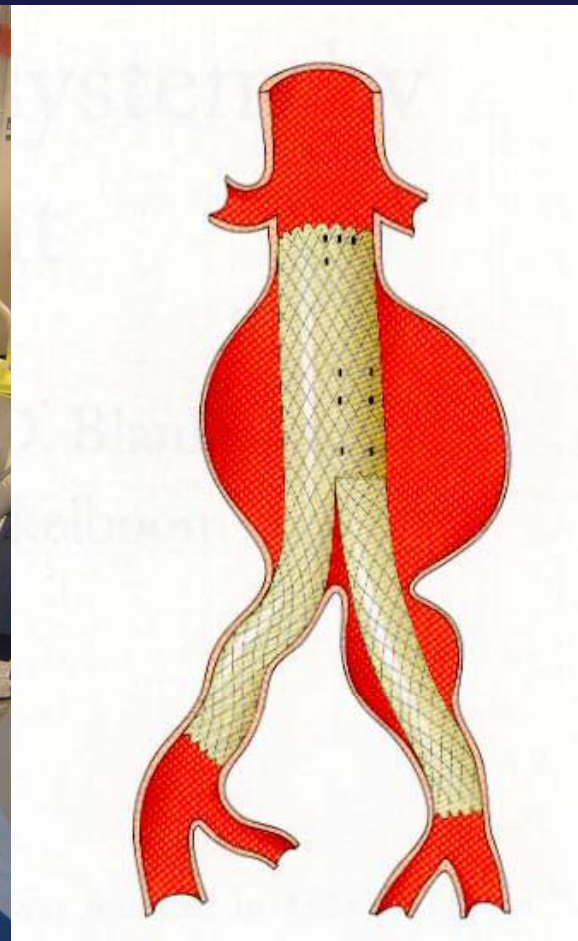
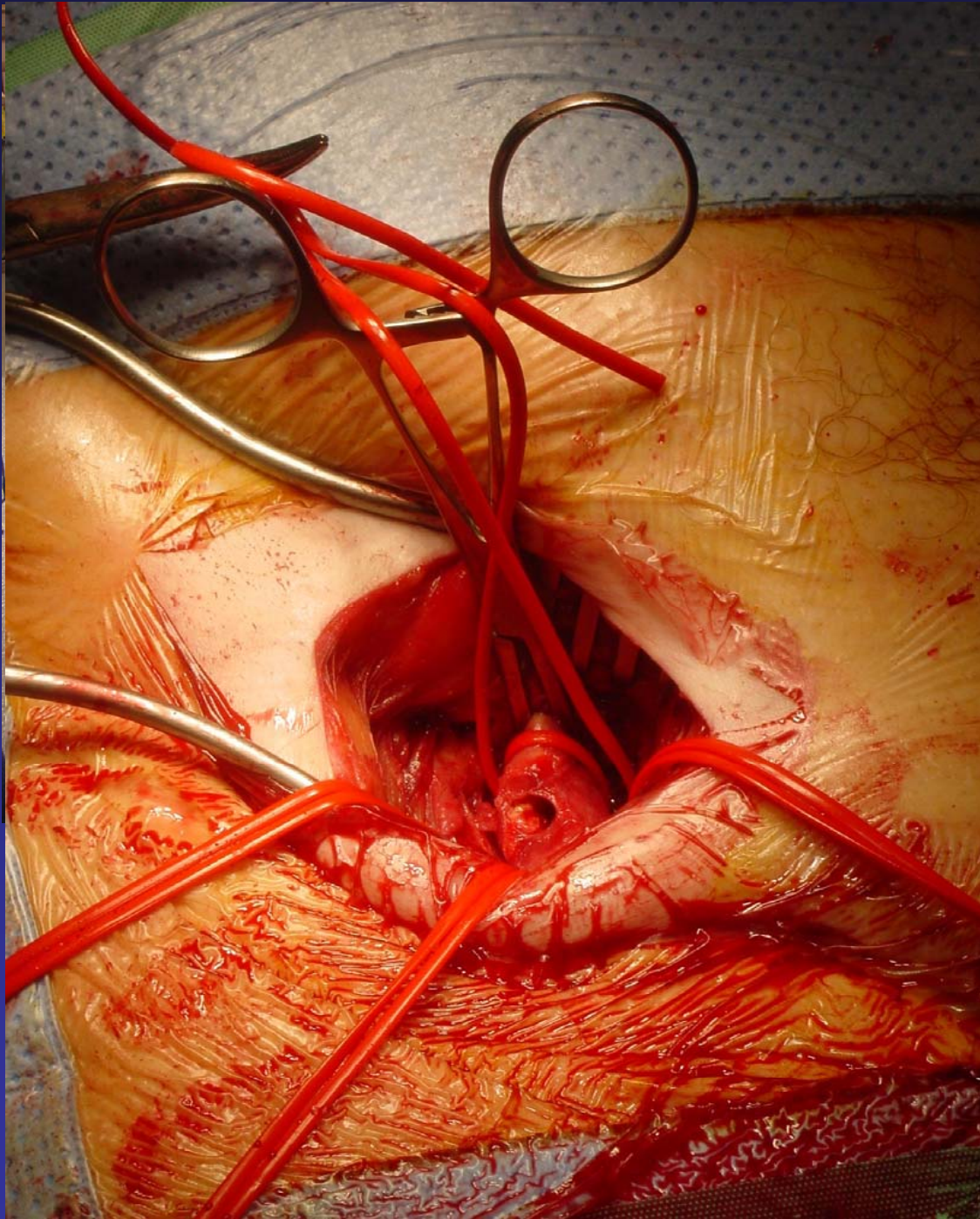
*J Parodi, J Palmaz, H Barone    Annals of Vascular Surgery (1991)*







NAL **CEPOD**



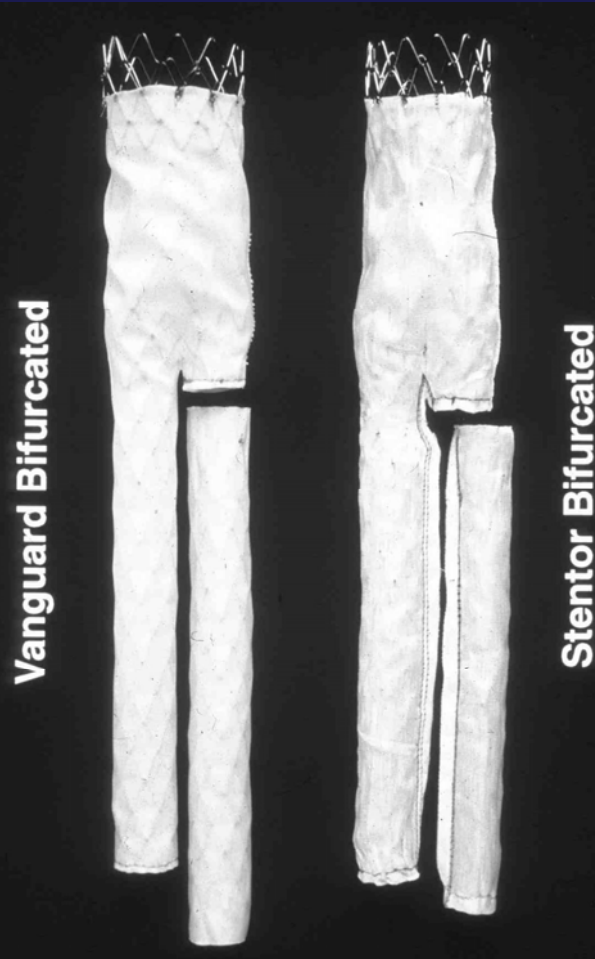
# EVAR morbidity & mortality

**Intuitively, stent grafts should be better...**



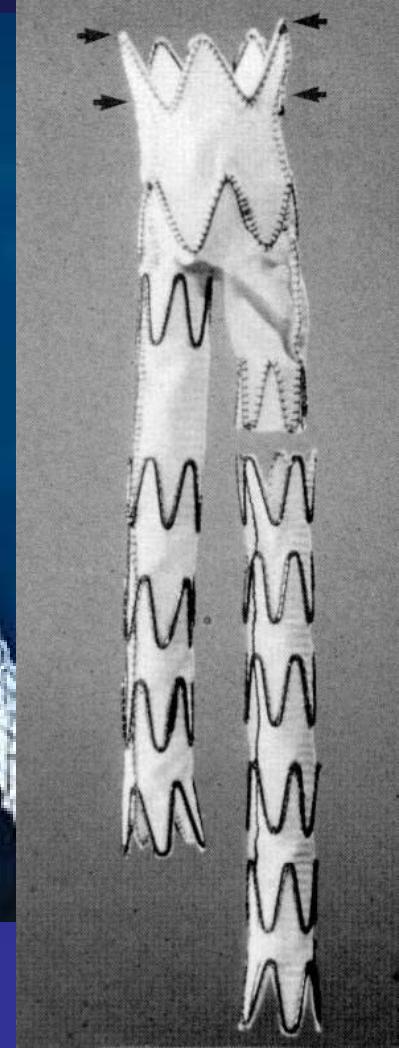
- **No laparotomy**
- **No aortic cross clamping**
- **Rapid recovery**
- **Reduced hospital stay**

# First Commercial Devices 1993 - 1997

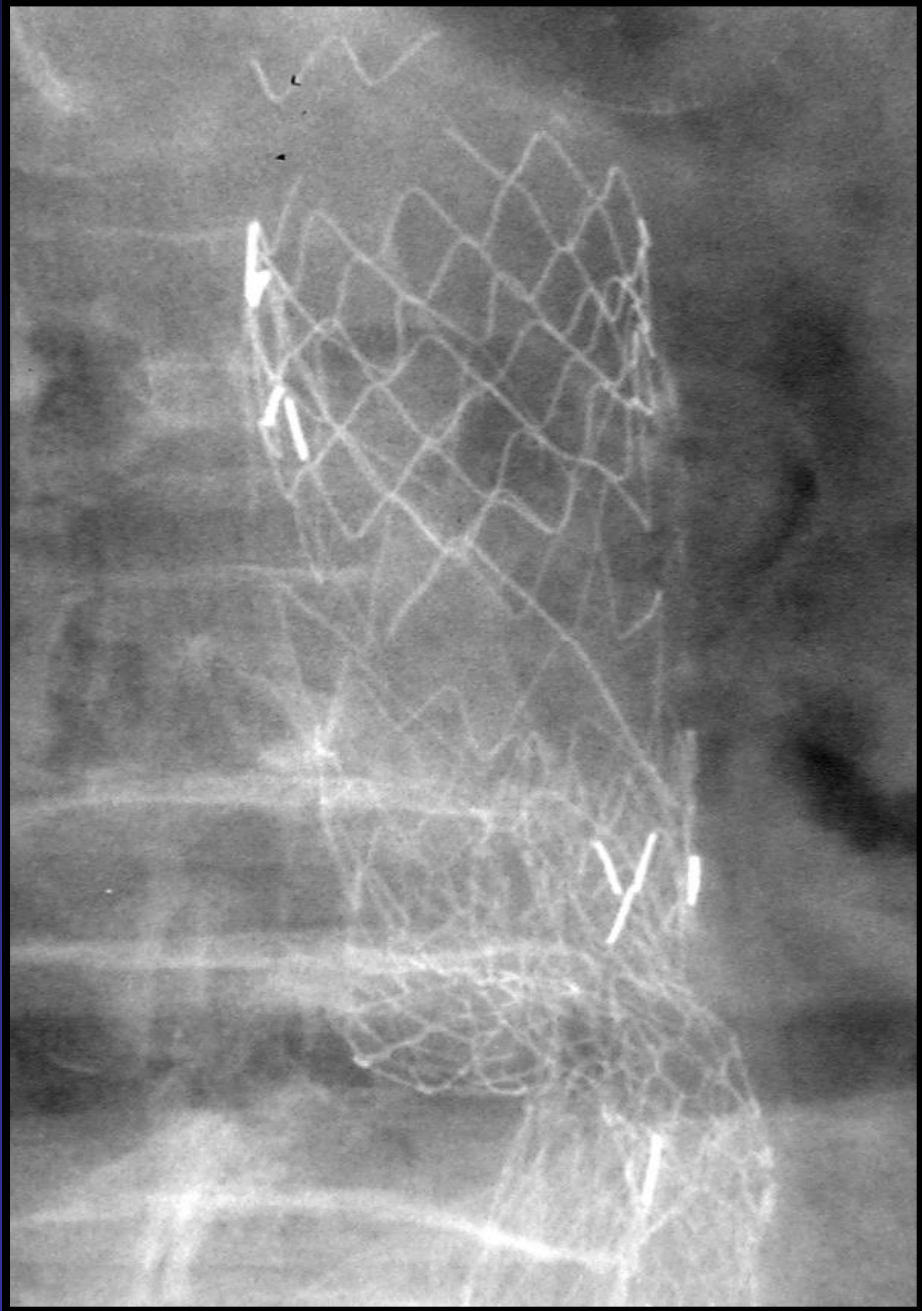
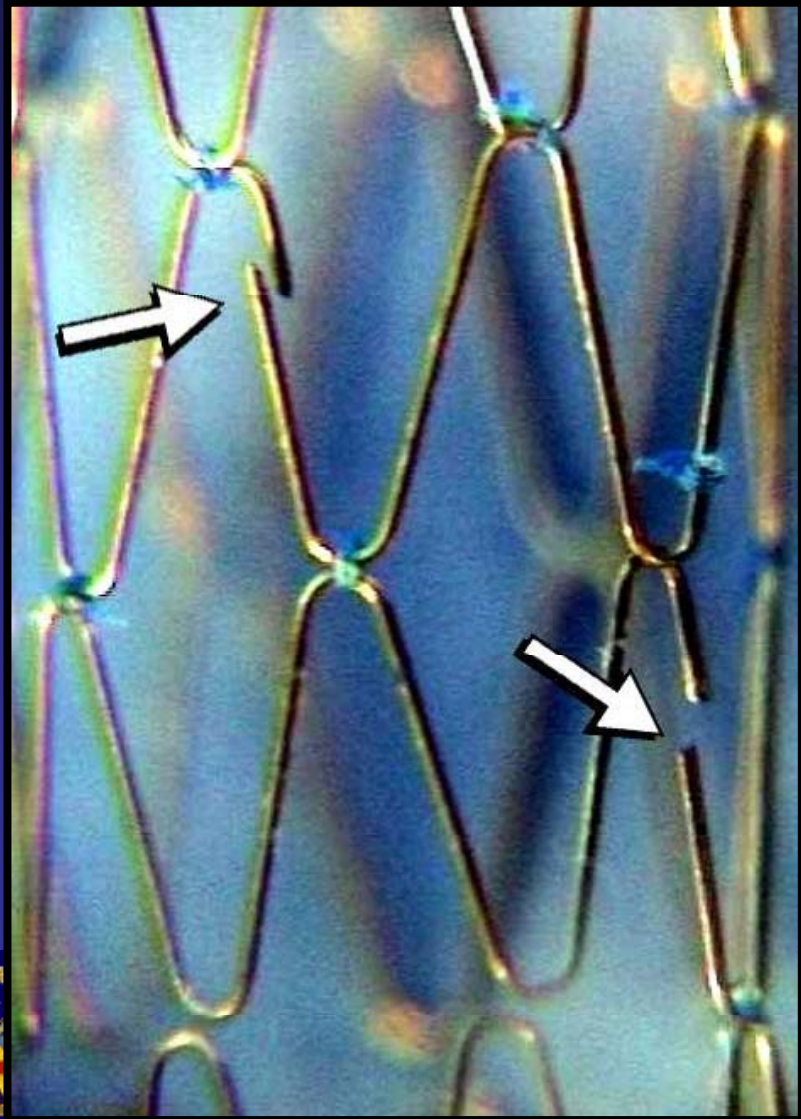


Vanguard Bifurcated

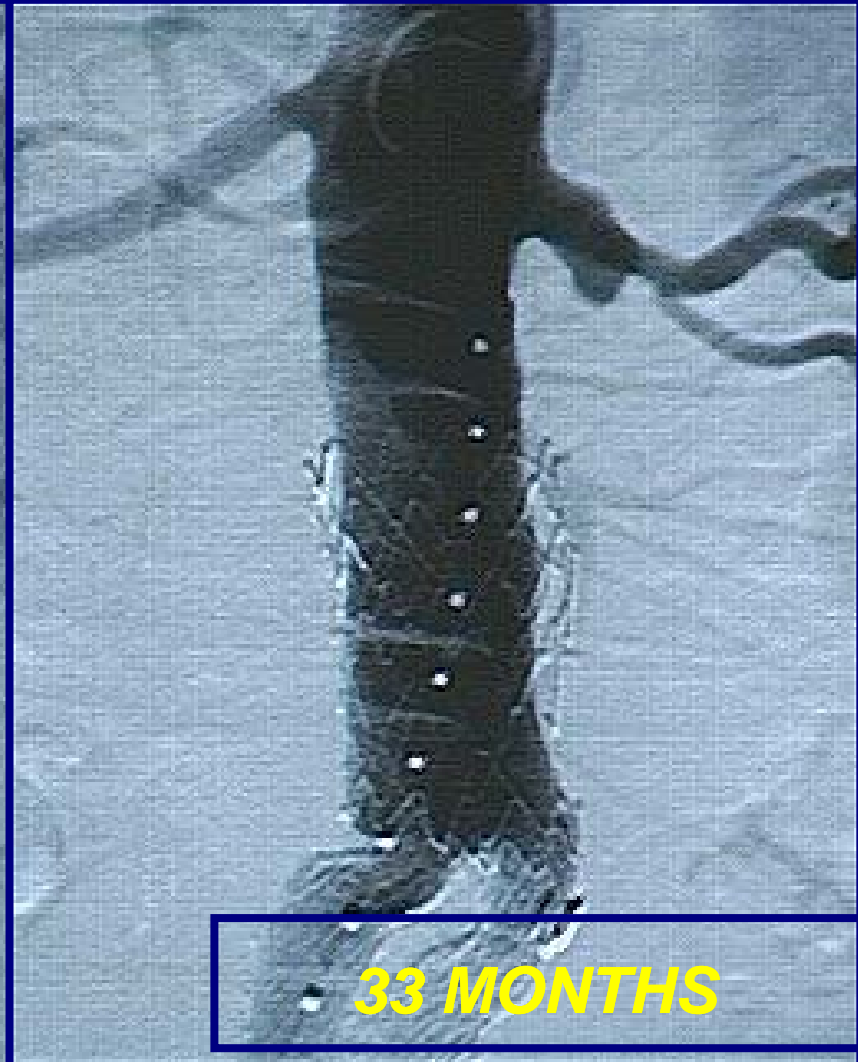
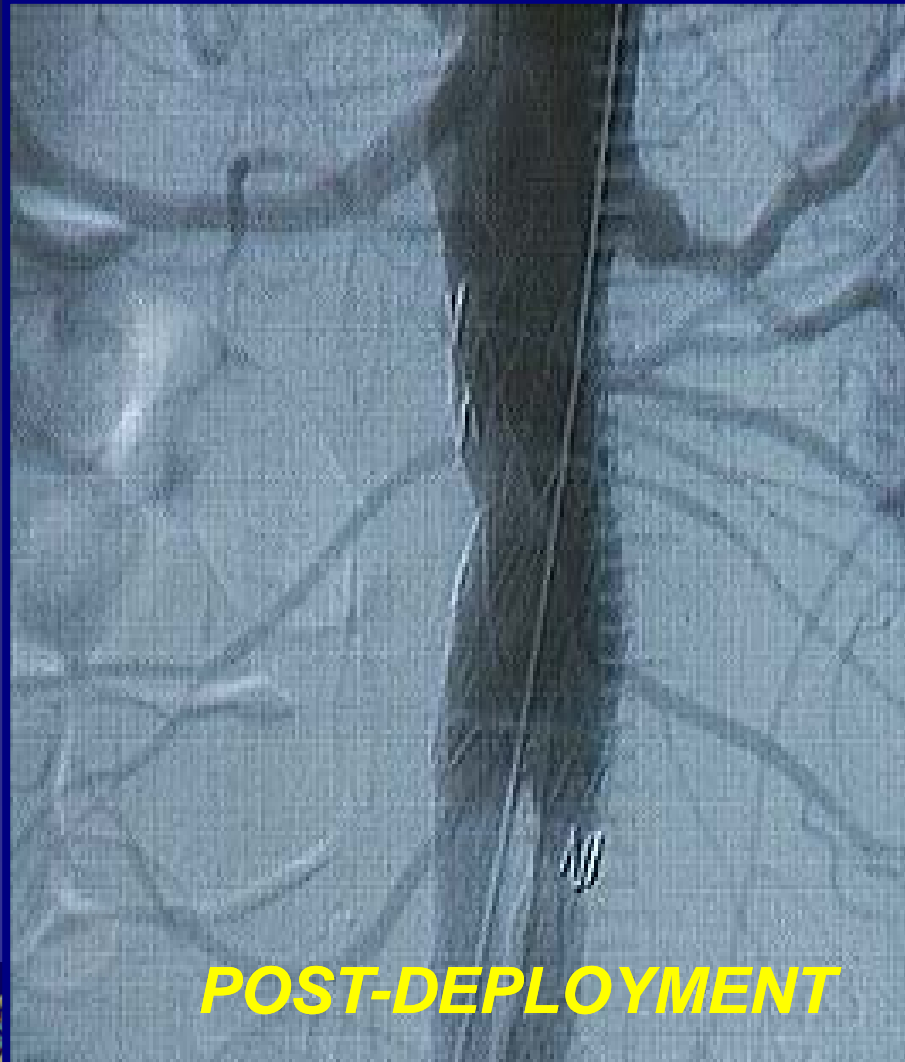
Stentor Bifurcated



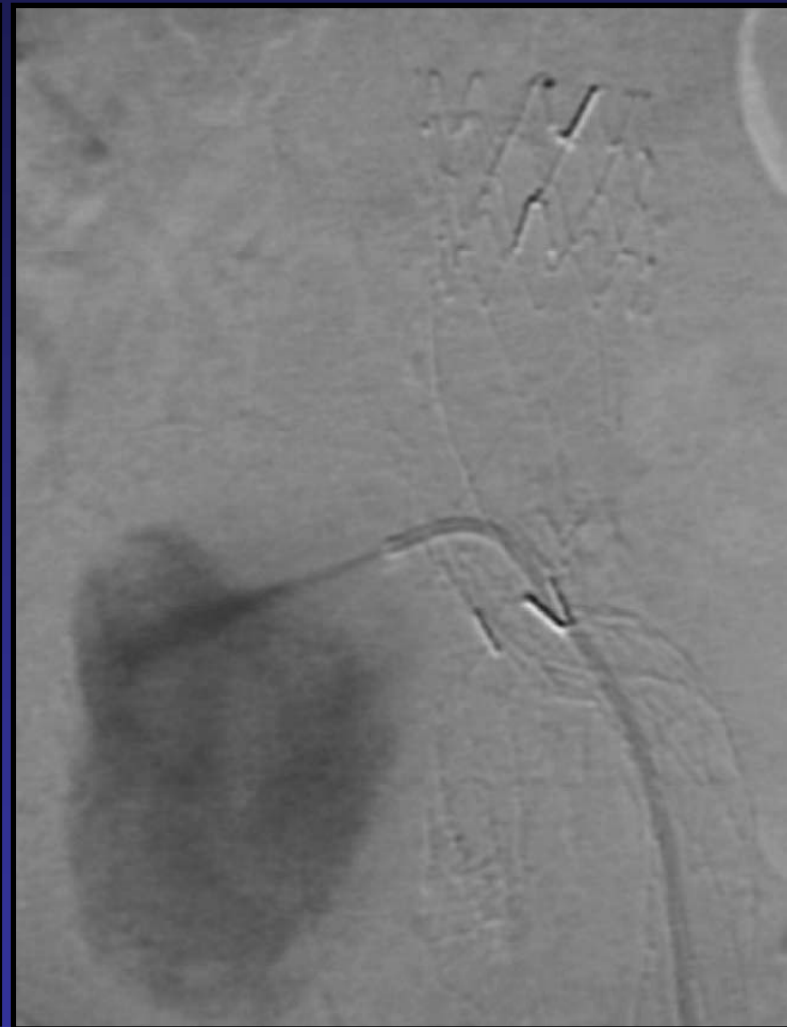
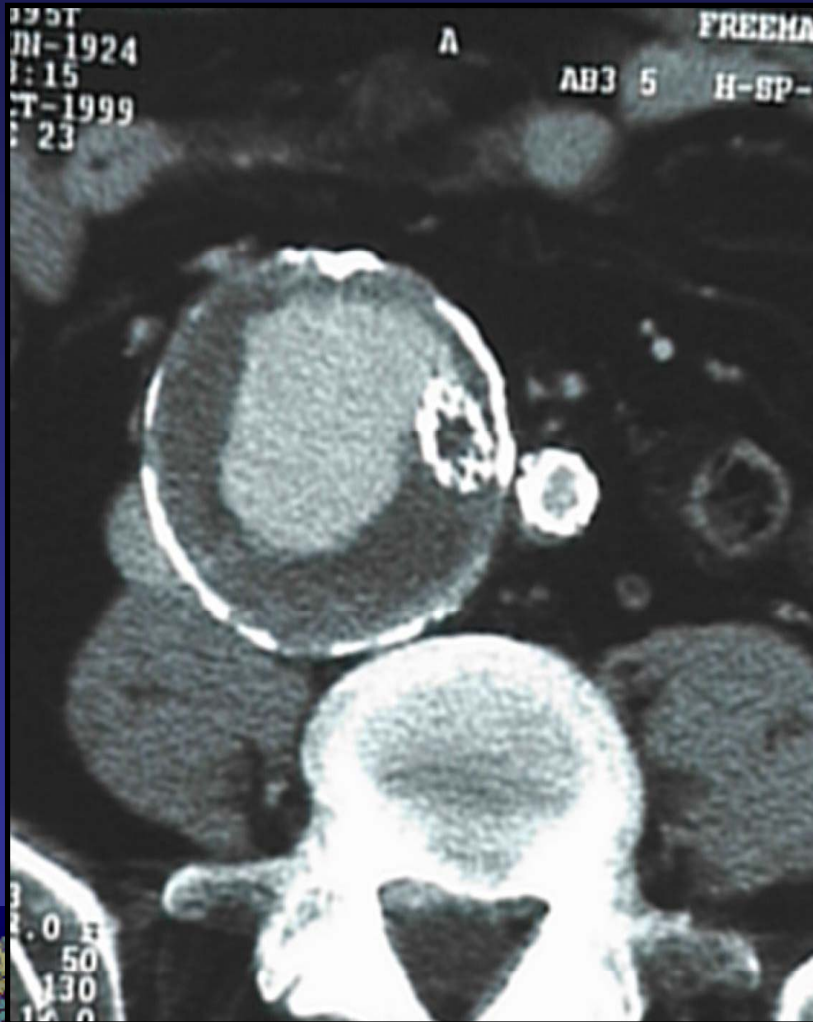
...disintegrate



# Device Migration



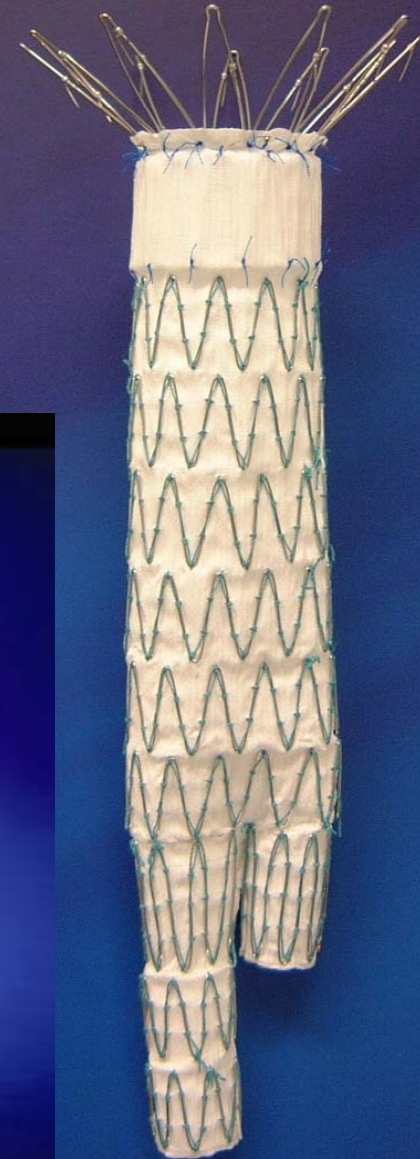
# Endoleaks ...



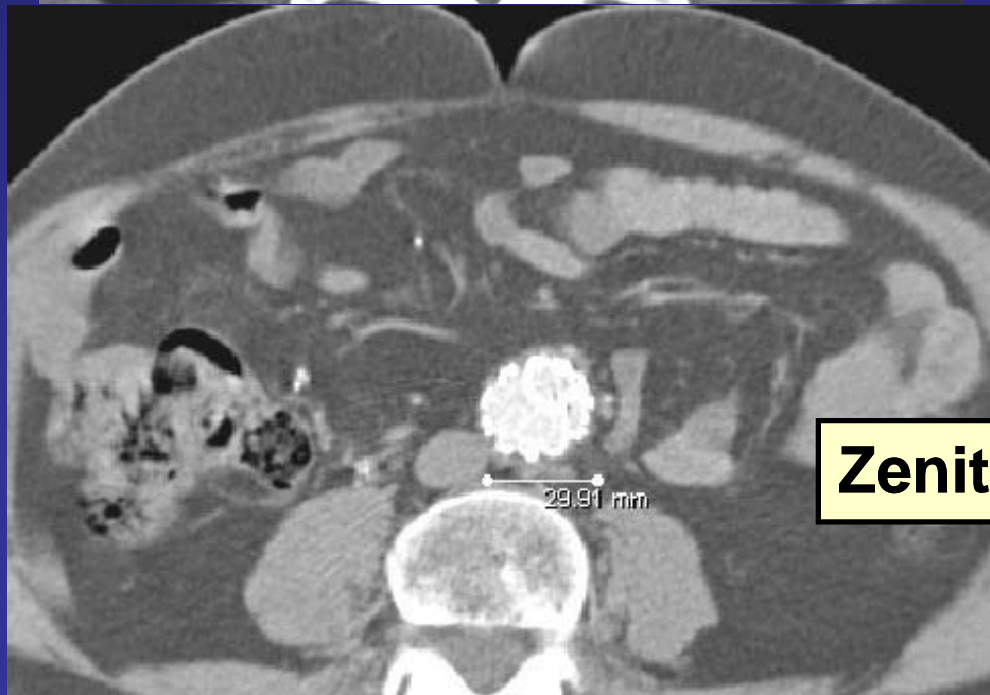
freeman

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## 2nd generation devices



# Results of newer grafts appear better...



**Zenith at 6 years**



# EVAR Registries

## Morbidity & mortality: level 2 evidence



**EUROSTAR DATABASE**  
holds > 8,012 cases

- Devices used: 28% Zenith  
22% Talent  
17% Van/Stentor  
14% AneuRx  
11% Excluder



[www.eurostar-online.org](http://www.eurostar-online.org)



# Early morbidity & mortality



## EUROSTAR DATABASE

July 2003 analysis of 5,466 cases

- 3,985 (73%) men
- mean age 71.8
- mean  $D_{\max}$  57.2 (30-45)
- mean hosp. stay 6.2 days

**in- hosp. mortality 1.7%**

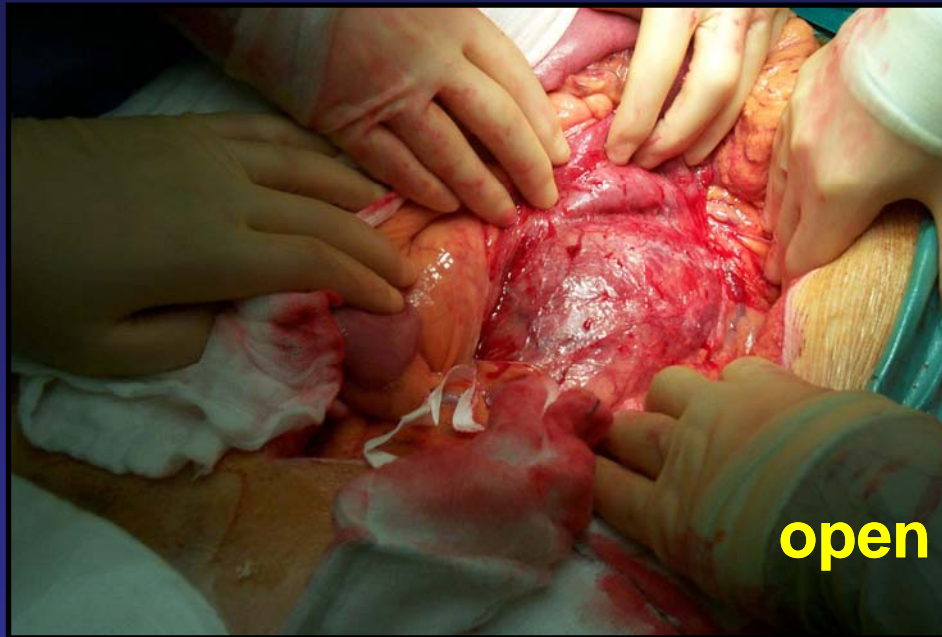


*Harris, 2004*



# Early morbidity & mortality

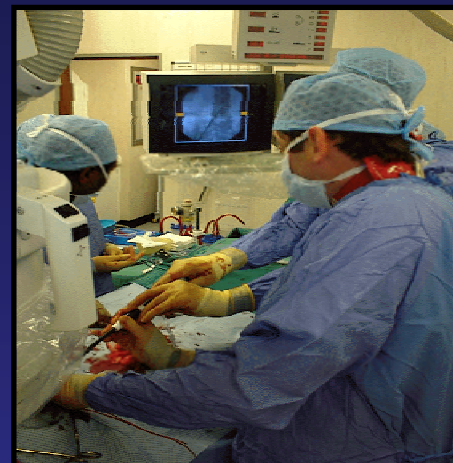
## Level 1 evidence: EVAR 1 trial



Randomised elective AAAs > 5.5cm  
41 UK hospitals: 1999 – 2004

# EVAR I : EARLY RESULTS

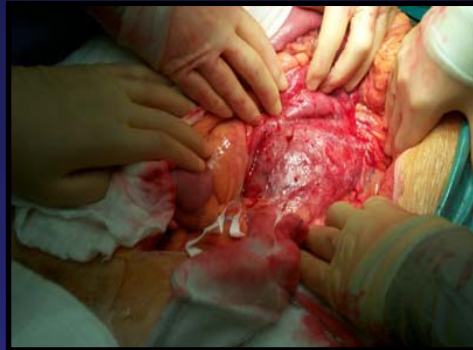
*Lancet August 2004*



	<b>OPEN</b>	<b>539</b>	<b>1082</b>	<b>EVAR</b>	<b>543</b>
<i>Age</i>		74		74.2	
<i>Male</i>		91%		91%	
<i>D<sub>max</sub></i>		6.5		6.5	

*risk factors well matched*

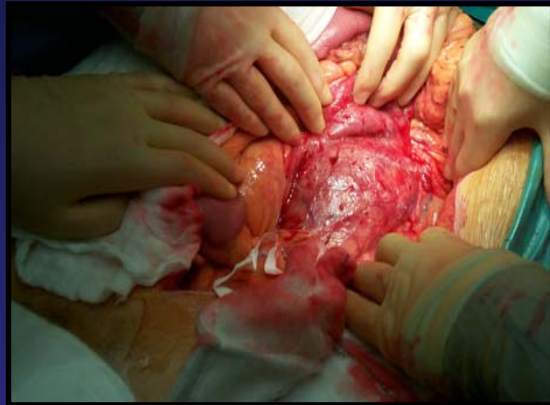
# EVAR I : EARLY RESULTS



	<b>OPEN 539</b>		<b>EVAR 543</b>
<i>(p:0.0004)</i>	35	<i>Days to Op.</i>	43
	10	<i>Pre-op rupture</i>	3

		<i>Intention to treat</i>	
<i>(p:0.016)</i>	<b>4.7%</b>	<b>30 day Mortality</b>	<b>1.7%</b>
	6.2%	<i>In-hosp Mortality</i>	2.1%

# EVAR I: Secondary Interventions



**5.8% v 9.8%**



<b>0</b>	<b><i>open conversion</i></b>	<b>10</b>
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<b>1</b>	<b><i>endoleak correction</i></b>	<b>18</b>
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<b>15</b>	<b><i>open exploration</i></b>	<b>1</b>
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<b>14</b>	<b><i>other surgery</i></b>	<b>21</b>
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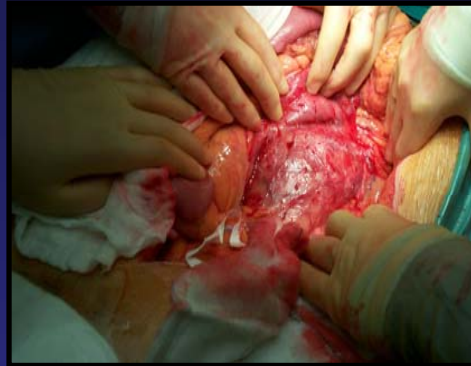


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# EVAR 1 trial: mid-term results

*Lancet, June 2005 (47% cases > 3 yrs)*



All cause mortality	29%	$p = 0.46$	26%
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Aneurysm related deaths	7%	$p = 0.04$	4%
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Hazard ratio: re-intervention after EVAR	2.7 (1.8 – 4.1)
$p = 0.0001$	

# EVAR 2 trial: mid-term results

*Lancet, June 2005 (36% cases > 3 yrs)*



best  
medical  
therapy

338 patients randomised	166		172
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30 day mortality	9%
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Aneurysm related deaths	20	<i>nss</i>	22
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Deaths from all causes	74	<i>nss</i>	68
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# Abdominal Aortic Aneurysm:

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A service in need of surgery?

The provision of facilities for diagnosis and treatment of Abdominal Aortic Aneurysms



# NCEPOD study

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Sample Size	884
• Elective open	434
• Emergency open	264
• <b>Endovascular</b>	<b>53</b>
• Non-operative	79



## **NCEPOD study:** endovascular repair

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- 49 / 53 (92%): male
- 43 / 53 (81%): elective
- 36 / 53 (68%): EVAR chosen = ASA status
- 48 / 53 (91%): unruptured, asymptomatic
  
- status of radiologist = consultant in 100%
  - 38% radiologists: no EVAR workload record
  - 64% cases: radiologist did > 10 evars / year



## NCEPOD study: endovascular repair

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- status of anaesthetist = consultant in 86%
- spinal anaesthesia: 33% cases
- post-op care: recovery area in 40%  
HDU bed in 48%  
ICU bed in 2% only



# endovascular repair

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morbidity < 30 days

- 17 / 53 (32%) device 'complications'  
*only 1 required re-intervention*
- 1 myocardial infarct (<2%)
- 4 chest infections (9%)
- 2 renal impairment (4%)

*All the non-device complications more frequent in the open repair group.*



# endovascular repair

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mortality < 30 days

- No outcome given for 6 cases
- All other patients survived
- 6.2% mortality in open repair group



# The role of endovascular repair ?

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- **evar suitability ~ 54% infra-renal aneurysms**
- **sophisticated imaging for planning**
- **high level of training**
- **issues: durability & cost**



# The role of endovascular repair



# The role of endovascular repair

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- Treatment of choice in:
  - ‘hostile abdomen’
  - fit patients over 70
- Unproven: holding technique in acute / r AAA
- Unproven where long term exclusion required
- Unproven for peri-renal / supra-renal AAA



*John Rose  
Freeman Hospital  
Newcastle*

