Results in EVAR, FEVAR, and BEVAR: Are Differences between Men & Women still present?

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Presentation Layout

• Literature Data

• Nuremberg Experience
• 20780 EVAR procedures in the UK
  – 11.2% Women

• Women
  – Older than men (78 vs 76 yrs, P<.001)
  – ↑ Length of Hosp. Stay (OR 1.86)
  – ↑ 30d Mortality (OR 1.54)
  – ↑ 30d Readmission (OR 1.23)
  – ↑ 1 year Mortality (OR 1.24)

→ Women: ↑ M&M vs Men
Systematic Review
– 9 Studies, 52018 men vs 11076 Women

Women
– ↑30d Mortality (2.3% vs 1.4%, OR 1.67)
– Less often eligible for EVAR

→ AAA Management in Women needs Improvement...
Gender and perioperative outcomes after fenestrated endovascular repair using custom-made and off-the-shelf devices

David E. Timaran, MD, a Martyn Knowles, MD, b Marilisa Soto-Gonzalez, MD, a J. Gregory Modrall, MD, a Shirling Tsai, MD, a Melissa Kirkwood, MD, a John Rectenwald, MD, a and Carlos H. Timaran, MD, a Dallas, Tex; and Chapel Hill, NC

(J Vasc Surg 2016;64:267-72.)

• 79 FEVAR procedures
  – 20% Women

• Women
  – ↑ Need of Endoconduit for access (19 % vs 2%, P=.02)
  – ↑ ICU Stay (3 days vs 2 days, P=.05)
  – ↑ Renal function deterioration (OR 8.1)
  – ↑ 30d Reintervention rate (OR 7.4)

→ Women: ↑ Morbidity & Reintervention vs Men
Inferior Outcomes in Women
Potential Reasons

• Women
  – Older at presentation
  – More hostile anatomy
  – More adjunct procedures
    • Smaller access?
  – Additional unknown factors?

Conclusion: These population-based data show that, following EVAR, women have a longer LoS and higher readmission and mortality than men. This reflects the same disparity in outcomes that is found in open AAA repair. Further work to clarify the cause of this is needed.
Nuremberg Experience
2010-2018

- EVAR
- FEVAR
- BEVAR
EVAR
(2010-03/2018)

• 442 Elective pts
  – Men: 399 (90.3%)
  – Women: 43 (9.7%)
EVAR
Anatomical & Risk Factors

• Mean ASA Score
  – Men: 2.35, Women: 2.38, NS

• Mean Age
  – Men: 72.6 yrs, Women: 76.7 yrs, P< 0.001

• Mean AAA Max Diameter
  – Men: 57.7mm, Women: 56.5mm, NS

• Mean Neck Length
  – Men: 29.4mm, Women: 25.6mm, NS
EVAR
Early Results

• 30d Mortality
  – Men: 1/399 (0.3%)
  – Women: 0/43 (0.0%)

P = 0.8, NS
EVAR
Follow-up (30 ± 24 months)

Survival

- **Men**
  - 99.2 ± 0.7% at 1 year
  - 93.1 ± 3.7% at 3 years

- **Women**
  - 100 ± 0.0% at 1 year
  - 92.4 ± 5.1% at 3 years
FEVAR
(2010-05/2018)

• 454 pts
  – Men: 412 (90.7%)
  – Women: 42 (9.3%)
FEVAR
Anatomical & Risk Factors

• Mean ASA Score
  – Men: 2.48, Women: 2.43, NS

• Mean Age
  – Men: 72.4 yrs, Women: 72.6 yrs, NS

• Mean AAA Max Diameter
  – Men: 59.9mm, Women: 60.1mm, NS

• Mean N of Fenestrations
  – Men: 3.35, Women: 3.14, P= 0.05
FEVAR
Early Results

- **30d Mortality**
  - Men: 2/412 (0.5%)
  - Women: 1/42 (2.4%)
  \[ P = 0.25, \text{ NS} \]

- **30d Major Complications**
  - Men: 46/412 (11.2%)
  - Women: 3/42 (7.1%)
  \[ P = 0.6, \text{ NS} \]
FEVAR
Follow-up (26 ± 20 months)

Survival

- **Men**
  - 95.0 ± 1.3% at 1 year
  - 86.0 ± 2.6% at 3 years

- **Women**
  - 92.1 ± 4.4% at 1 year
  - 83.1 ± 7.4% at 3 years
BEVAR
2010-11/2018

• 377 pts
  – Men: 295 (78.2%)
  – Women: 82 (21.8%)*

* Higher Percentage of Women compared to EVAR & FEVAR
BEVAR
Anatomical & Risk Factors

- Mean ASA Score
  - Men: 2.81, Women: 2.88, NS

- Mean Age
  - Men: 69.5 yrs, Women: 70.1 yrs, NS

- Mean AAA Max Diameter
  - Men: 66.9mm, Women: 67.4mm, NS

- Mean N of Fenestrations/Branches
  - Men: 3.73, Women: 3.68, NS
BEVAR
Early Results

• **30d Mortality**
  – Men: 17/295 (5.8%)
  – Women: 10/82 (12.2%) \( P = 0.045 \)
  • (Technical Success: 95% for both groups)

• **30d Major Complications**
  – Men: 70/295 (23.7%)
  – Women: 24/82 (29.3%) \( P = 0.3, \text{ NS} \)
## Mortality Events

<table>
<thead>
<tr>
<th>Men</th>
<th>Women</th>
</tr>
</thead>
<tbody>
<tr>
<td>MOF N=7</td>
<td>MOF N=2</td>
</tr>
<tr>
<td>AMI N=3</td>
<td>AMI N=1</td>
</tr>
<tr>
<td>Postop Bleeding N=2</td>
<td>Postop Bleeding N=4</td>
</tr>
<tr>
<td>Subdural Hematoma N=2</td>
<td>Heart tamponade N=1</td>
</tr>
<tr>
<td>Pulmonary embolism N=1</td>
<td>Stroke N=1</td>
</tr>
<tr>
<td>Respiratory infection N=1</td>
<td>Refused Hemodialysis N=1</td>
</tr>
<tr>
<td>Status epilepticus N=1</td>
<td></td>
</tr>
</tbody>
</table>

↑ Mortality in Women due to ↑ Bleeding Complications?
BEVAR
Follow-up (22 ± 18 months)

Freedom from Reinterventions

- **Men**
  - 79.1 ± 3.1% at 1 year
  - 67.7 ± 4.1% at 3 years

- **Women**
  - 86.1 ± 4.5% at 1 year
  - 80.0 ± 5.7% at 3 years

→ Women: ↓ Reinterventions during Follow-up
BEVAR
Follow-up (22 ± 18 months)

Survival

- **Men**
  - 85.0 ± 2.7% at 1 year
  - 78.2 ± 3.3% at 3 years

- **Women**
  - 80.6 ± 4.7% at 1 year
  - 72.4 ± 6.2% at 3 years
Conclusions

• EVAR
  – Literature: Women inferior outcomes vs men
  – Nuremberg Series: No differences observed

• FEVAR
  – Literature: Scarce
  – Nuremberg Series: No differences observed
Conclusions

• BEVAR
  – Literature: none
  – Nuremberg Series
    • Women ↑ 30d Mortality but ↓ Late reintervention rate

→ Stricter selection for female patients?
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