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

Eric Verhoeven, MD, PhD, A. Katsargyris, MD
Paracelsus Medical University, Nuremberg, Germany
Disclosures

- William Cook Europe/Cook Inc.
  - Consultant & Research grants
- W.L. Gore & Associates
  - Consultant & Research grants
- Atrium
  - Consultant
- Siemens
  - Consultant
- Bentley
  - Consultant
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
5795 Elective EVAR Procedures
- 19% Women

Women
- Older than men (76 vs 73 yrs, P<.001)
- ↑ Operative times (138 min vs 131min, P<.01)
- ↑ renal & lower limb revascularisation (6.6% vs 3.8%, P<.01)
- ↑ 30d Mortality (3.2% vs 1.2%, P<.001)

→ Women: ↑ M&M vs Men
- Systematic Review
  - 9 Studies, 52018 men vs 11076 Women
- Women
  - \( \uparrow \) 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

P = .53, NS
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%), \( P = 0.3, \text{ NS} \)
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
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?
Results in EVAR, FEVAR, and BEVAR: Are Differences between Men & Women still present?

Eric Verhoeven, MD, PhD, A. Katsargyris, MD
Paracelsus Medical University, Nuremberg, Germany