

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



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  - *Consultant*

# Presentation Layout

- Literature Data
- Nuremberg Experience

# Sex-related Outcome Inequalities in Endovascular Aneurysm Repair

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Eur J Vasc Endovasc Surg (2016) 52, 518–525

- 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

# Sex Differences in Mortality and Morbidity following Repair of Intact Abdominal Aortic Aneurysms

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*J Vasc Surg.* 2017 April ; 65(4): 1006–1013

- 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

# Morphological suitability for endovascular repair, non-intervention rates, and operative mortality in women and men assessed for intact abdominal aortic aneurysm repair: systematic reviews with meta-analysis

*Pinar Ulug, Michael J Sweeting, Regula S von Allmen, Simon G Thompson, Janet T Powell, on behalf of the SWAN collaborators\**

Lancet 2017; 389: 2482-91

- 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,<sup>a</sup> Martyn Knowles, MD,<sup>b</sup> Marilisa Soto-Gonzalez, MD,<sup>a</sup> J. Gregory Modrall, MD,<sup>a</sup> Shirling Tsai, MD,<sup>a</sup> Melissa Kirkwood, MD,<sup>a</sup> John Rectenwald, MD,<sup>a</sup> and Carlos H. Timaran, MD,<sup>a</sup>  
*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

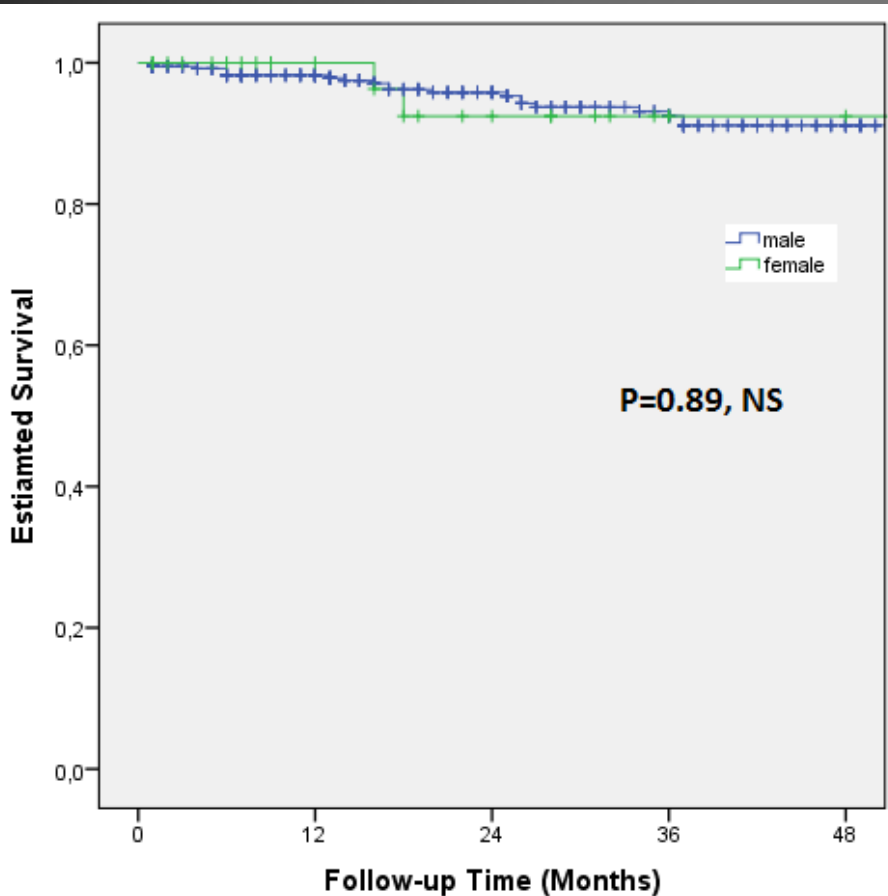
- 30d Mortality
  - Men: 1/399 (0.3%)
  - Women: 0/43 (0.0%)

P= 0.8, NS

# EVAR

## Follow-up ( $30 \pm 24$ months)

### Survival



- Men
  - $99.2 \pm 0.7\%$  at 1 year
  - $93.1 \pm 3.7\%$  at 3 years
- Women
  - $100 \pm 0.0\%$  at 1 year
  - $92.4 \pm 5.1\%$  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, NS

- 30d Major Complications

- Men: 46/412 (11.2%)
- Women: 3/42(7.1%)

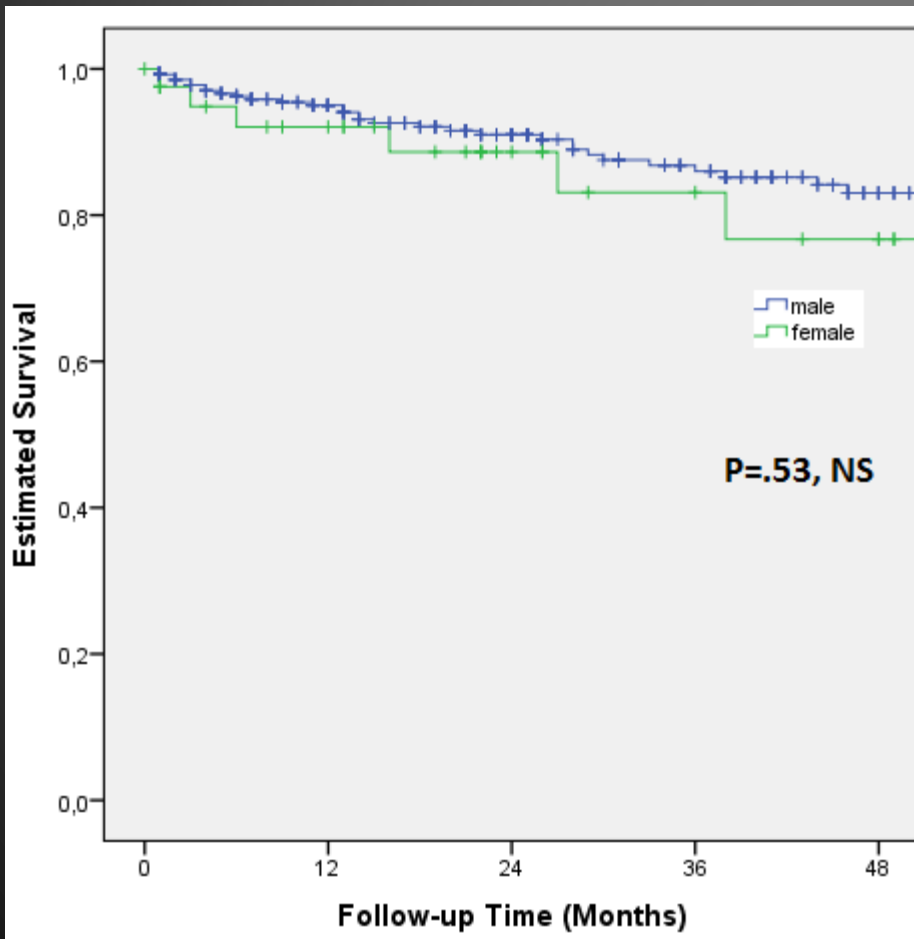
P= 0.6, NS



# FEVAR

Follow-up ( $26 \pm 20$  months)

## Survival



- Men

- $95.0 \pm 1.3\%$  at 1 year
- $86.0 \pm 2.6\%$  at 3 years

- Women

- $92.1 \pm 4.4\%$  at 1 year
- $83.1 \pm 7.4\%$  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

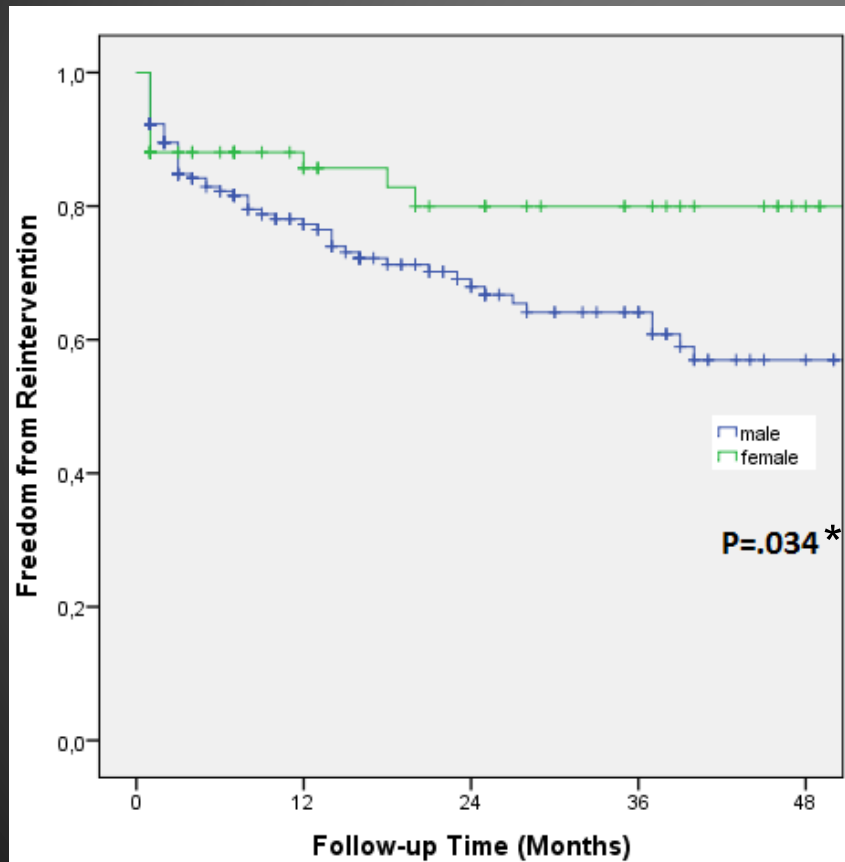
## Early Results

- 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, NS

# BEVAR

Follow-up ( $22 \pm 18$  months)

## Freedom from Reinterventions



- Men

- $79.1 \pm 3.1\%$  at 1 year
- $67.7 \pm 4.1\%$  at 3 years

- Women

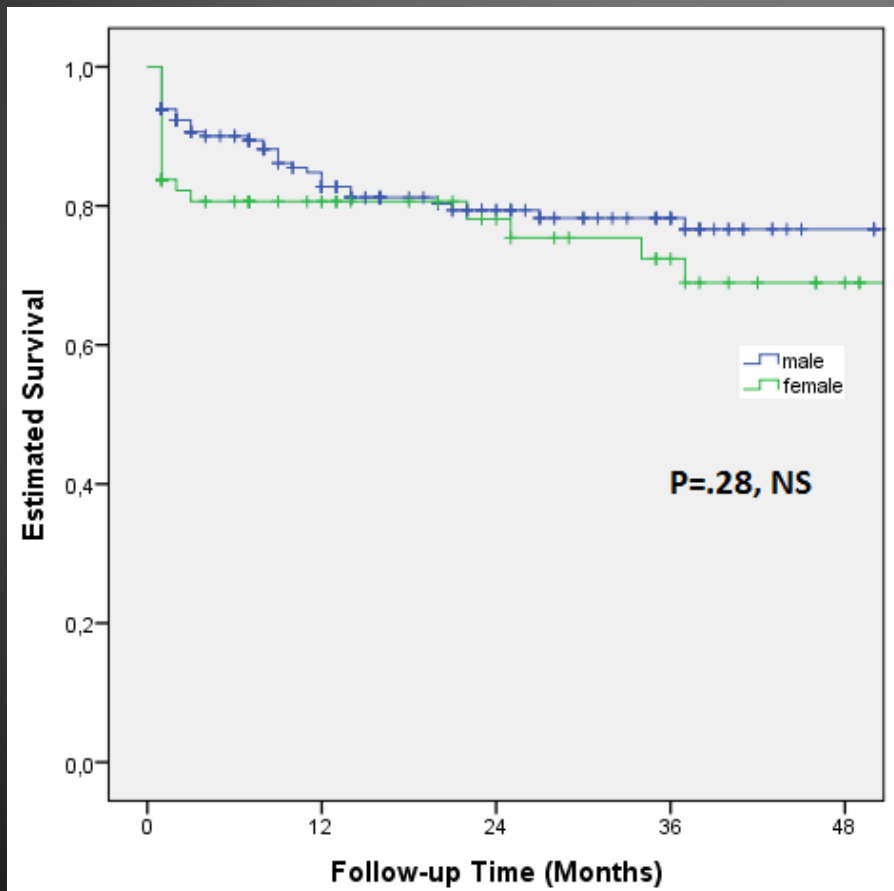
- $86.1 \pm 4.5\%$  at 1 year
- $80.0 \pm 5.7\%$  at 3 years

→ Women: ↓ Reinterventions during Follow-up

# BEVAR

Follow-up ( $22 \pm 18$  months)

## Survival



- Men

- $85.0 \pm 2.7\%$  at 1 year
- $78.2 \pm 3.3\%$  at 3 years

- Women

- $80.6 \pm 4.7\%$  at 1 year
- $72.4 \pm 6.2\%$  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?



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