EVAR FOR OCTOGENARIANS
Insights from the ENGAGE Registry

Bibombe Patrice Mwipatayi
Clinical Associate Professor – Vascular Surgery
University of Western Australia, Perth, Australia
OLUFEMI OLUFEMI, FRCS, JACQUE WONG BSc, MPH

DISCLOSURE
Speaker name: Bibombe Patrice Mwipatayi

I have the following potential conflicts of interest to report:
- Receipt of grants/research support: Biotronik, Medtronic, Getinge Maquet
- Receipt of honoraria and travel support
- Participation in a company sponsored speakers’ bureau
- Employment in industry
- Shareholder in a healthcare company
- Owner of a healthcare company

I do not have any potential conflict of interest

EVLING LANDSCAPE OF AAA REPAIR

The EVAR adoption rate has grown significantly over the years
- Today, it’s the preferred method of AAA repair
- Significant reduction in perioperative morbidity and mortality vs OSR
- EVAR, an attractive alternative especially in high risk patients

By 2050
The Population Of The World Will Rise To 10.1 Billion
Two Billion More Than Expected
2 Billion Will Be Over 60

The Centre for Health Development

EVOLVING LANDSCAPE OF AAA REPAIR

Ageing is a global phenomenon

- Japan
- Italy
- China
- India
- Australia

According to the World Population Prospects 2019 Bulletin

Globally, the aging population has and will continue to increase in size
EVAR – being less invasive and better tolerated than OSR – is often the therapy of choice for patients ≥ 80 years old
THE EVIDENCE GAP FOR EVAR IN PATIENTS ≥ 80 YEARS OLD

- Long-term outcomes of EVAR with a contemporary endograft are scarce in the literature for patients ≥ 80 years old, especially compared to a younger cohort of similarly treated patients.

- The ENGAGE Registry – 1293 patients treated with Endurant with 5-year follow-up, affords us the opportunity to test the hypothesis:

  Patients ≥ 80 years old can be treated safely with a contemporary endograft while also experiencing acceptable long-term clinical outcomes.

<table>
<thead>
<tr>
<th>Age &lt; 80 years</th>
<th>Age ≥ 80 years</th>
</tr>
</thead>
<tbody>
<tr>
<td>n = 973 pts</td>
<td>n = 290 pts</td>
</tr>
</tbody>
</table>

OCTOGENARIANS PRESENT WITH MORE CHALLENGING ANATOMY AND POORER OVERALL HEALTH

- Baseline characteristics:
  - More likely to be female (13.8% vs 9.6%, p=0.039)
  - Larger maximum AAA diameter (2.8 cm vs 2.6 cm, p=0.007)
  - Higher infrarenal neck angle (39.7° vs 29.5°, p=0.021)

- Key Risk Factor differences:
  - Less likely to use Tobacco, be Alcoholics, or have Liver Disease or Hypertension
  - More likely to present with:
    - Arrhythmia: 21.5% vs 14.5%, p=0.005
    - Renal Insufficiency: 20.1% vs 14.2%, p=0.016
    - ASA Class III/IV: 61.7% vs 49.3%
    - SVS 3: 100% vs 15.9%, p<0.001

THESE BASELINE CHARACTERISTICS LED TO MORE DEMANDING INDEX PROCEDURES FOR ≥ 80 YEAR OLD PATIENTS

- Higher estimated blood loss, longer procedure time

<table>
<thead>
<tr>
<th>Procedure and fluoroscopy times</th>
</tr>
</thead>
<tbody>
<tr>
<td>Baseline Procedure Years</td>
</tr>
<tr>
<td>Fluoroscopy Time</td>
</tr>
<tr>
<td>0</td>
</tr>
<tr>
<td>20.1</td>
</tr>
</tbody>
</table>

Even with these challenges, ≥ 80 year old patients still experienced similar and very high Technical Success: 99.4% vs 95.6%, p=0.007

HOW DO CLINICAL OUTCOMES COMPARE WITH < 80 YEAR OLD PATIENTS?

- 30 day outcomes clinically comparable:
  - No difference in Type Ia, II endoleaks
  - No rupture in either cohort.
  - All-Cause Mortality (ACM) similar (1.4% vs 1.2%, p=0.44)

However, from the 1 year to 5 year follow-up, ≥ 85 year old patients ACM and AAA maximum diameter diverge significantly.

Major Adverse Events (MAE)

- MAE within 30 Days
  - Propensity Matched Cohort

<table>
<thead>
<tr>
<th>Event</th>
<th>Age &lt; 80 years</th>
<th>Age ≥ 80 years</th>
<th>p-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>One or more MAE</td>
<td>4.1% (12/290)</td>
<td>5.3% (15/290)</td>
<td>0.669</td>
</tr>
<tr>
<td>All cause mortality</td>
<td>2.1% (6/290)</td>
<td>1.4% (4/290)</td>
<td>0.752</td>
</tr>
<tr>
<td>Bleed ischemia</td>
<td>0.2% (1/290)</td>
<td>0.2% (1/290)</td>
<td>1.000</td>
</tr>
<tr>
<td>Myocardial infection</td>
<td>1.0% (3/290)</td>
<td>2.4% (7/290)</td>
<td>0.339</td>
</tr>
<tr>
<td>Paraplegia</td>
<td>0.0% (0/290)</td>
<td>0.0% (0/290)</td>
<td>--</td>
</tr>
<tr>
<td>Procedural blood loss ≥ 100cc</td>
<td>1.0% (3/290)</td>
<td>2.4% (7/290)</td>
<td>0.339</td>
</tr>
<tr>
<td>Renal failure</td>
<td>0.3% (1/290)</td>
<td>0.5% (1/290)</td>
<td>1.000</td>
</tr>
<tr>
<td>Respiratory failure</td>
<td>0.0% (0/290)</td>
<td>0.0% (0/290)</td>
<td>--</td>
</tr>
<tr>
<td>Stroke</td>
<td>0.0% (0/290)</td>
<td>0.3% (1/290)</td>
<td>1.000</td>
</tr>
</tbody>
</table>

Even with extensive propensity matching, Freedom From Ananeurysm-Related Mortality remains similar and high:

- 1-year Freedom From All-Cause Mortality: 95.5% vs 95.6%
- 5-year Freedom From All-Cause Mortality: 92.0% vs 92.6%
- p=0.0128

Even with extensive propensity matching, Freedom From Ananeurysm-Related Mortality remains low for ≥ 80 year old patients:

- 30 day Freedom From All-Cause Mortality: 95.5% vs 93.5%
- p=0.008
Freedom From Endoleaks

All Endoleaks

Type I & III

CAROTID ARTERY ENDOVASCULAR INTERVENTION - STENTING

Retrospective Analysis

- January 2007 to September 2018
- 3 centers: Royal Perth Hospital, Joondalup Health Campus, Hollywood Private Hospital

Age < 80 (n = 169)

Age ≥ 80 (n = 44)

Average Age (years)
69.25
85.40

Co-morbidity

Smoking history
60 (35.7)
9 (20.0)

Diabetes Mellitus
55 (32.7)
15 (33.33)

Arrhythmia
28 (16.6)
8 (17.8)

CAD
76 (45.4)
26 (57.8)

Previous CABG
17 (10.1)
5 (11.11)

Hypertension
139 (82.7)
37 (82.2)

Hyperlipidaemia
106 (63.1)
21 (46.7)

CRF
17 (10.12)
8 (17.78)

PAD
77 (45.8)
21 (46.7)

ASA

ASA 2
26 (21.1)
6 (16.2)

ASA 3
85 (69.1)
28 (75.7)

ASA 4
12 (9.8)
3 (8.1)

Baseline Characteristics – octogenarians vs. non-octogenarians – very similar

Total number of deaths at 5 years post-CAS

< 80 years
15 (9.41%)

≥ 80 years
24 (14.2%)

CAROTID ARTERY ENDOVASCULAR INTERVENTION - STENTING

SUMMARY

EVAR FOR OCTOGENARIANS

- Compared to a younger cohort, elderly patients (specifically those ≥ 80 years of age) present with:
  - Challenging baseline anatomical characteristics
  - More risk factors
  - Poorer overall physical status

- While 5 year ACM and AAA sac dynamics are worse compared to younger patients, their key aortic outcomes are similar:
  - Aneurysm-related mortality
  - Ruptures / Conversion
  - 2nd endovascular procedures

CONCLUSIONS

EVAR FOR OCTOGENARIANS

- The ENGAGE Registry has allowed us to demonstrate that elderly patients, specifically those ≥ 85 years of age, can be treated safely with EVAR using a contemporary endograft while experiencing acceptable long-term clinical outcomes.

- All-Cause Mortality is the biggest threat to these patients, likely due to their overall baseline characteristics and risk factors at presentation.

- Further examination of CAS octogenarian data to determine if like EVAR All-Cause Mortality is the biggest threat to these patients, or whether CAS is associated with increased adverse events in the octogenarian population.

THANK YOU