EVAR in Severely Angulated Neck

Could We?

Should We?

Boonprasit Kritpracha, MD
Dhanakom Premprabha, MD
Jitpreedee Sungsiri, MD
Wittawat Tantarattanapong, MD
Pong Juntarapatin, MD
Sorracha Rookapan, MD

Prince of Songkla University, Hat Yai, Thailand
Disclosure

Course teaching/ Proctor: Medtronic
Challenging Aortic Necks
Severely Angulated Neck,
How much can we do?
(with good short- & long-term results)
71 year-old male, symptomatic 6.5 cm AAA CAD, stroke
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Options:

1. Open repair  X

2. Conservative treatment

3. Endovascular Repair  
   “a safe and effective option ???”
Prince of Songkla U. experience
January 2009 – November 2014

Reviewed all AAA patients with neck angle >60° treated with Endurant stent graft in Songklanagarind hospital

Study – demographic data
perioperative data
follow up imaging studies
EVAR in severe angulated neck

Neck angle up to 75°

Endurant
RESULTS

EVAR in neck angle

>60°  
106 patients

83 males, 23 females

Average age 75.1 years (58 - 88)

AAA diameter, average 68 mm (34-112)

Neck diameter, average 22 mm (16-32)

Neck length, average 27 mm (12-58)

Neck angle, average 92° (63-166)
RESULTS

106 patients – 3 groups

- Neck angle 60° – 75°: 22 cases (21%)
- Neck angle 76° – 90°: 37 cases (35%)
- Neck angle > 90°: 47 cases (44%)

84 cases (79%)
## Average Measurements

<table>
<thead>
<tr>
<th>Group</th>
<th>AAA diameter</th>
<th>Neck diameter</th>
<th>Neck length</th>
<th>Infrarenal angle</th>
<th>Suprarenal angle</th>
</tr>
</thead>
<tbody>
<tr>
<td>60° - 75°</td>
<td>68</td>
<td>22</td>
<td>26</td>
<td>69°</td>
<td>39°</td>
</tr>
<tr>
<td>76° - 90°</td>
<td>67</td>
<td>21</td>
<td>24</td>
<td>82°</td>
<td>52°</td>
</tr>
<tr>
<td>&gt; 90°</td>
<td>68</td>
<td>22</td>
<td>31</td>
<td>108°</td>
<td>62°</td>
</tr>
</tbody>
</table>
RESULTS

98% Technical success

Exclude aneurysm from circulation

1 proximal endoleak (sealed @ 1 month)

1 renal artery coverage (renal stent)

No 30-day mortality
RESULTS

Follow up, average 19 months (1-60)

No device migration

No proximal endoleak
EVAR in severe angulated neck

73 yo male, 60 mm AAA

No migration
No Proximal endoleak
AAA stable

Pre-op
AAA 58 x 60 mm

1-month PO

5-year PO
AAA 58 x 57 mm
EVAR in severe angulated neck

74 yo female, 50 mm symptomatic AAA

Pre-op
AAA 45 x 50 mm

1-month PO
AAA 31 x 34 mm

No migration
No Proximal endoleak
AAA stable

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EVAR in severe angulated neck

68 yo male, 62 mm AAA

Pre-op
AAA 62 x 60 mm

1-month PO
AAA stable

3-year PO
AAA 60 x 50 mm

No migration
No Proximal endoleak
EVAR in severe angulated neck

No migration
No Proximal endoleak
AAA stable

77 yo male, 91 mm AAA

Pre-op
AAA 91 x 75 mm

1-month PO
AAA 83 x 64 mm

2-year PO
EVAR in severe angulated neck

75 yo female, 66 mm AAA

No migration
No Proximal endoleak
AAA stable

Pre-op
AAA 66 x 66 mm

1-month PO
1-year PO
AAA 55 x 48 mm
BUT........

There are some technical difficulties.
Shortened neck

From 3 cm-long neck
EVAR in severe angulated neck

- Neck may be shortened during the procedure
Accuracy of device deployment
Accuracy of device deployment

When in doubt, deploy a little low.
EVAR in severe angulated neck

- Neck may be shortened during the procedure
- Accuracy of the deployment below to the renal arteries
Removal of delivery system

Stuck !?!!?

What to do?
Change its angle

Belly pushing
EVAR in severe angulated neck

- Neck may be shortened during the procedure
- Accuracy of the deployment below to the renal arteries
- Belly-pushing may help
chimney procedure (5 cases, 5%) to maximize neck length

Neck diameter 22 mm
Neck length 13 mm
Neck angle 84°
EVAR in severe angulated neck

- Neck may be shortened during the procedure
- Accuracy of the deployment below to the renal arteries
- Belly-pushing may help
- Chimney procedure (occ. needed) 5%
RESULTS
Proximal extension needed in 32 cases (30%)
<table>
<thead>
<tr>
<th>Group</th>
<th>Aortic cuff needed</th>
</tr>
</thead>
<tbody>
<tr>
<td>60° - 75°</td>
<td>2/22 (9%)</td>
</tr>
<tr>
<td>76° - 90°</td>
<td>8/37 (22%)</td>
</tr>
<tr>
<td>&gt; 90°</td>
<td>22/47 (47%)</td>
</tr>
</tbody>
</table>
EVAR in severe angulated neck

- Neck may be shortened during the procedure
- Accuracy of the deployment below to the renal arteries
- Belly-pushing may help
- Chimney procedure (occ. Needed)
- Proximal extension cuff may be needed (30%)
71 year-old male, symptomatic 6.5 cm AAA CAD, stroke

Options:

1. Open repair
2. Conservative treatment
3. Endovascular repair
Shortened neck
A need to maximize the neck (chimney, parallel)
Proximal extension cuff
*(Sandwich procedure)*
71 yo male, symptomatic 6.5 cm AAA

6-month PO
EVAR may be offered for AAA patients with severe angulated neck, who are not candidate for open repair.

Need longer neck length, there are technical challenges, and the procedure can be difficult.

Good short- and mid-term results.
Thank you

Songklanagarind hospital
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