Tips and Tricks to perform successful standard EVAR in AAA with severely angled necks: Neck Length is Key

Boonprasit Kritpracha, MD
Prince of Songkla University
Hat Yai, Thailand

Disclosure
Medtronic: Teaching course, Proctor

Severely angled neck is STILL a challenge. Current devices' limitation 60º, 75º, 90º

More common in Asians

Open Surgery IS the treatment of choice.

Patients with significant comorbidities
Options:
1. Open repair
2. Conservative treatment
3. Endovascular Repair "safe, effective, durable option?"

High Risk: CAD, COPD

High Risk: CAD, Recent stroke

Prince of Songkla U. experience
January 2009 – July 2017
Reviewed all AAA patients with neck angle >60º treated with Endurant stent graft in Songklanagarind hospital
Study – demographic data perioperative data follow-up imaging studies
RESULTS

154 patients
EVAR, neck angle > 60°

121 males, 33 females (22%)
Average age 75.8 years (56-91)

AAA diameter, average 69 mm (34-112)
Neck diameter, average 22 mm (16-32)

Neck length, average 27 mm (12-58)
Neck angle, average 91° (62-166)

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Average age 75.8 years (56-91)

EVAR, neck angle > 60°

154 patients – 5 groups, Neck angle

61°–75° 76°–90° 91°–105° 106°–120° >120°
35 cases 50 cases 38 cases 17 cases 14 cases
23% 32% 25% 11% 9%

119 cases (77%)

Our approach

**Neck length**
- Infrarenal: ≥ 15 - 20 mm
- Parallel graft: ≥ 20 - 25 mm

**Adjunct procedure**
- Proximal cuff extension
- Parallel graft (chimney, sandwich)
- HeliFx

**Deployment technique**
- Cover all neck
  - (Just below the lowest renal a.)
- Avoid renal a. coverage
  - (Low deployment + cuff extension)

When in doubt, deploy a little low

Proximal Endoleak treated with
Proximal cuff extension & Heli-Fx

Courtesy of Kunchai Lawanwong, MD
Police General Hospital, Bangkok

Shortened neck

1 cm-long neck

Parallel extended graft

EVAR in severely angulated neck

Neck angle up to 75°
EVAR in severe angulated neck
Longest follow up

EVAR in severe angulated neck
74 yo female, 50 mm symptomatic AAA

PRE-OP
AAA 81 x 73 mm

1.5-year PO
AAA 77 x 74 mm

8-year PO
AAA 77 x 74 mm

RESULTS

95% Technical success
Exclude aneurysm from circulation
8 proximal endoleak 5%
1 renal artery coverage (renal stent)

30-day mortality – 4 cases (2.6%)
2 MIs
1 stroke
1 ruptured AAA

RESULTS

Proximal Endoleak

8 Proximal Endoleaks:
1 sealed spontaneously @ 1 month
3 sealed w/adjunct procedures
Proximal extension @ 1 month
Heli-Fx @ 1 year
Chimney @ 2.5 years

3 ruptures @ 22 days, 1 year, & 1.5 years
1 f/u @ 12 months

<table>
<thead>
<tr>
<th>Angle Range</th>
<th>Cases</th>
<th>%</th>
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<tbody>
<tr>
<td>45°–60°</td>
<td>30 cases</td>
<td>32%</td>
</tr>
<tr>
<td>61°–75°</td>
<td>15 cases</td>
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<td>106°–120°</td>
<td>12 cases</td>
<td>13%</td>
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<tr>
<td>&gt;120°</td>
<td>5 cases</td>
<td>5%</td>
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</tbody>
</table>

119 cases (77%)
Proximal Endoleak treated with Heli-Fx

RESULTS

Follow up, average 25 months (1-106)

2 late proximal endoleaks
@ 3 & 5 years PO
Both from neck dilatation
Persistent type II endoleak

Follow up, average 25 months (1-106)

2 late proximal endoleaks
@ 3 & 5 years PO
Both from neck dilatation
Persistent type II endoleak

No Device migration (>10 mm)
1 case - 7 mm migration
EVAR in severe angulated neck
7 mm distal migration

Options:
1. Open repair
2. Conservative treatment
3. Endovascular Repair
   “safe, effective, durable option?”

Patients with significant comorbidities
High Risk:
- CAD, COPD

High Risk:
- CAD, Recent stroke

Symptomatic, large AAA
Severe angled neck

77 year-old male, Rapidly enlarged 92 mm AAA
EVAR

Conclusions
- EVAR should be considered for AAA patients with severely angled neck, "who are not candidates for open repair."
- Need longer neck length (20-25 mm).
- Need adjunct procedures:
  - Cuff, Parallel graft, Heli-Fx.
- High success rate:
  - Once in, most likely the stent graft will stay there.
- Up to 90° angled neck may be reasonable for EVAR.
Thank you

Songklanagarind hospital