“Double balloon” technique for salvaging a maldeployed straight aortic endograft

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Disclosure

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I have the following potential conflicts of interest to report:
- Consulting
- Employment in industry
- Stockholder of a healthcare company
- Owner of a healthcare company
- Other(s)

- I do not have any potential conflict of interest
Introduction

- Peri-procedural malpositioning of a stentgraft following EVAR occurs in 2.5%-13.2% of cases. (1)
- Coverage of major branch vessels can be disastrous and lead to open conversion.
- More commonly seen in emergency cases or when faced with less favourable neck anatomies.
- If technically feasible, renal stenting or chimney techniques should be considered.

Other adjunctive rescue techniques:

- "pull-down maneuvers"
  - Cross-wire across the device bifurcation
  - Single balloon pulled downward

Case report

- 80yo male with severe comorbidity presented with a symptomatic infrarrenal AAA.

- Aneurysm features:
  - 5.8mm Ø with wide patent lumen
  - Angulated proximal neck with inverted conical shape
  - Potential landing zone (3cm) above the aortic bifurcation

- No 36mm Ø graft immediately available in our emergency stock

- Potentially suitable grafts available:
  - 36x70 Endurant straight endograft
  - 28x100 close web straight Valiant endograft
Intended strategy

28x100 close web straight *Valiant* endograft distally

36x70 straight *Endurant* endograft proximally
However...

- Misplacement of the distal endograft to 1 cm below the lowest renal artery

- Proper opening of the proximal stent graft could be jeopardized due to the constraining effect of the 28 mm Valiant graft

- Very likely led to development of a highly difficult to seal type I endoleak.

Reposition the upper end of the distal stent graft caudally into the sac in order to gain enough room for an accurate deployment of the proximal graft.
Wire across flow diverter not applicable

Balloon pulled downward
  - technically straightforward
  - can be hazardous:
    - movement of the graft unpredictable
    - loss of 1cm distal attachment
    - wide aneurysm lumen

Increased chance of dragging the entire graft into the sac
“Double balloon” technique
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12F sheath enables controlled movement of B1

traction

stabilization
Reposition of the proximal end of the graft
Follow-up CT scan 1y post-procedure:
-no leaks
-no device migrations
What does B2 bring to the art?

- **Stabilises** the position of the distal attachment
- Additional *longitudinal support* (1)
- **Allows** greater traction on the proximal balloon
- **Protection** against wall trauma secondary to graft dragging at the aortic bifurcation?

Technical issues

• **Optimum position for B1:**
  - Avoid ballooning across the bare springs as this could result in stent impactation.
  - A too caudal position can make the pull down maneuver ineffective, favouring entire graft migration into the sac.

• Controlled tugs monitored fluoroscopically.

• **Extra-stiff wire** through B2 throughout the manoeuvre to maintain stability, and give guidance in case realignment with another graft became necessary.
Technical issues

• Role of proximal anchoring barbs/hooks hindering pull-down manoeuvres.

• Potential related complications (distal embolisation, dissection, rupture/perforation, arterial occlusion) did not occur.

• Definitive statements regarding the overall risk of this maneuver cannot be drawn.

• Efficacy of this technique in thoracic stenting or dealing with bifurcated grafts remains to be seen.
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