Late Results Of Parallel Grafts (Chimneys) For Juxta- And Pararenal AAAs Can Be Good if Done Right: Self-Expanding vs. Balloon-Expanding Branch Stents: Which Is Best

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Performance and Indication of Chimney grafts
- Balloon Expandable (Advanta V12, Lifestream Bard etc.)
- Self Expandable (Viabahn)
- Bare Metal

Length of the Chimney graft determines whether self expanding or balloon

Overlap
Dictates kind of chimney graft. At least 1.5 cm desirable

Length of Chimney Graft determines whether Balloon expandable or self expandable Stent

Conflict of Interest
CONSULTANT
- Medtronic
- Trivascular
- Silkroad Medical
Sizing

How to size the main aortic endograft in a chimney procedure

Koelble et al.

The best conditions for parallel stenting during EVAR: an in vitro study

G Mestres, J P Uribe, C Garcia-Madrid, E Miret, X Alomar, M Burrell, V Riambau


MATERIALS/METHODS: In-vitro silicon aneurysmal neck models of different diameters, with one side-branch, were constructed. Two different endografts (Medtronic-Endurant Abdominal Aortic Aneurysm Endoprosthesis; three diameters each), and two stents (self-expanding Gore Viabahn Endoprosthesis and balloon-expandable Atrium Advanta V12; 6-mm diameter) were tested, applying three endograft-oversizing degrees (15%, 30% and 40%).

RESULTS: Increasing oversizing (15%, 30% and 40%) significantly decreased gutter areas (11.5, 6.2, 4.3 mm(2), P < 0.001); nevertheless, main endograft infolding of most 40%-oversized stent grafts was detected, particularly with Excluder devices. Lower stent compression, but wider gutters, were observed with the Excluder stent-graft and V12 when compared to Viabahn parallel stents. The Endurant-Viabahn combination resulted in maximum stent compression (35%).

CONCLUSIONS: Better endograft-stent apposition was achieved when using 30% endograft oversizing. Lower stent compression, but wider gutters, were observed with the Excluder stent-graft and V12 parallel stents, achieving maximum stent compression with the Endurant-Viabahn combination.

Flexible balloon expandable Stent

Compliant aortic stent

Lifestream Bard

Incraf Cordis

Must be avoided:
- Too much radial force of aortic stent:
  - Neck dilation
  - Compression of bridging stent

Small Suprarenal Aortic Diameter

• Alternative to chimney grafts in small aortas:
  - Debranching
  - Open surgery
  - Periscope configuration
  - Surgeon modified fenestration
Technical Issues: Periscopes: Balloon expandable Stents and Periscopes do not work together!

Narrow Aorta

- Chimney right renal artery
- Periscope left renal artery
- Infrarenal stent + juxtarenal cuff

Bail out Narrow Aorta I

- Hybrid Procedure
- Debranching

Bail out Narrow Aorta II

- Scallop SMA
- Chimney Renal Artery

Technical Considerations: Chimneys and Gutters

- High low and low flow endoleaks: "High-flow" (HF) endoleaks appear immediately during contrast injection and "low-flow" (LF) endoleaks are significantly delayed.
- The role of Onyx, coils etc.

Deployment of coils - immediate sealing
Coiling of gutters: 2 Periscopes + 1 Chimney SMA

Alternatively Sandwich TAAA II

3 months later

Plan B Contained Rupture

Acute Aneurysm Indication for Chimney + Aptus => Active Gutter

Elimination
Nothing more important than flexibility!

Conclusion

The type of chimney graft depends on:

- Length
- Radial Force of the Aortic Stent Graft
- Parallel Graft Configuration
- Surgeon’s preference