Value And Limitations Of Aortic Arch Chimneys With Mid And Long-Term (> 5 Years) Follow Up: How To Make Them Work

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Single Center Chimney Population


Registry
95 pt

Review
182 pt

122 CHIMNEY PATIENTS

TECHNICAL SUCCESS 100%
16 MONTHS MEAN F-UP

Overall Survival Freedom from Aorta related Death

ASA III/IV 43/43 100%

Technical Success 43/43 100%

Emergency 8/43 18.6%

Mortality 4 9.3%

Procedure related complication Stroke (2 ruptured -2 elective) 4
Paraparesis 1
Early Type 1 Endoleak 0

Thrombectomy Embolization Anticoagulation Remote


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Veith Symposium
Connecting The Vascular Community

Outcomes of thoracic endovascular aortic repair using aortic arch chimney stents in high-risk patients

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Mortality 4%
Stroke 11%
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European Multicenter Registry for the Performance of the Chimney/Snorkel Technique in the Treatment of Aortic Arch Pathologic Conditions

Michel J. Bosiers, MD, Konstantinos P. Donas, MD,* Nicola Mangialardi, MD, Giovanni Tersello, MD, Vincent Riambau, MD, Frank J. Criado, MD, Frank J. Verhe, MD, Sasa Ronchey, MD, PhD, Stefano Fanzini, MD, and Mario Lachat, MD

95 PTS → 48 EMERGENCY

• TECHNICAL SUCCESS 89.5%
• 30 DAYS MORTALITY 9.5%
  (NONE AORTA RELATED)
  MAJOR STROKE 2%
• TYPE I EL 10.5%
  (SOLVED SPONTANEOUSLY 50%)
• PRIMARY PATENCY 98%
• REINTERVENTION RATE 5.8%

Ch-TEVAR Values: #1 Unintended Overstenting
OVERSTENTING OF INNOMINATE ARTERY
TRANS-BRACHIAL WALLSTENT 11-70

Ch-TEVAR Values: #2 Emergent Repair

Ch-TEVAR Values: #3 Symptomatic Aneurysms
Ch-TEVAR Values:

#4 Patients Unfit For Custom

#5  >2cm Sealing w Single Chimney

Ch-TEVAR Values: 

- Acute
- Hostile Necks (RT, Prev Surg)

CH-TEVAR

THE DARK SIDE OF THE MOON
Ch-TEVAR Limitations: #1 Stroke

Reducing Stroke Rate

- Beware shaggy aortas
- Limit manoeuvres in the arch
- Reduce chimney/combine with debranching

Ch-TEVAR Limitations: #2 T1EL/Gutters

Aortic graft Oversizing

OVER-SIRIX

Ch-TEVAR Limitations: #3 Retrograde Dissection

GUTTERS

CHIMNEY OVERLAPPING ➔ HOW LONG?

- Longer chimney ➔ reduce EL (gutters)
- Bad landing zone ➔ curvature/graff LZ
RETROGRADE TYPE A
Day 4 sudden death

Ch-TEVAR Limitations: #4 Parallel Graft Patency

Main Graft Characteristics

<table>
<thead>
<tr>
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<th>Ch-TEVAR: CTAG with active control system</th>
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</thead>
<tbody>
<tr>
<td>Proximal sealing zone</td>
<td>100 30 40 38</td>
</tr>
<tr>
<td>Distal sealing zone</td>
<td>42 30 43 15</td>
</tr>
<tr>
<td>Body spring</td>
<td>41 31 9 23</td>
</tr>
</tbody>
</table>

CONFORMABILITY & MATERIAL FATIGUE

Ch-TEVAR Limitations: CTAG with active control system

30-day CTA
Ch-TEVAR Limitations: #4 Parallel Graft Patency

Parallel Graft Characteristics

flexibility ≈ radial force

LENGTH/DIAMETER & MATERIAL FATIGUE

REINFORCE THE PARALLEL GRAFT!!

ESPECIALLY IF LONG

CH-TEVAR Limitations: #4 Parallel Graft Patency

Parallel Graft Configuration

VESSELS TAKE-OFF

REDUCE INTERACTION IN THE ASCENDING

Ch-TEVAR Ultimate Limitations

NO RULES

MUCH LIMITS

MUCH FEAR

ChEVAR with Endurant/Endurant IIS

STANDARDIZING CARE

POSITIVE CLINICAL RESULTS
FOLLOW-UP

TYPE I ENDOLEAK 6 (13.9%)
MEAN F-UP 44.6 MTHS (MIN 1-152)

Ia 5
Sac enlargement 2 (Ia 6 mths - LSA 10 mths)
(2 embolization + 1 ascending replacement)
w/out sac enlargement 3 (LCCA)(Ia)(LCCA+LSA)
(91 yrs / lung K → death / COPD & tracheostomy)

 Ib 1 (47 mths)
(distal extension)

STENT FRACTURE
LSA Stent Fracture after 2 months
PATENT AT 54 mths

Close F-Up
Follw Up → CTA @ 1 – 3 -12 months - yearly

Gutter Type1A Endoleak
Branch Occlusion
Stent Fracture
Migration
Neck Evolution

COMPLICATIONS

FOLLOW-UP

CHIMNEY GRAFT COMPLC. 4 (9.3%)
MEAN F-UP 39.6 MTHS (MIN 1-144)

– LSA ASYMPT OCCL 1 (11 MTHS)
– LCCA ASYMPT OCCL 1(22 MTHS) (TREATED → BYPASS)
– STENT FRACTURE (ASYMPT) 1 (2 MTHS)
– VIABAHN STENOSIS 1 (24 MTHS)

VIABAHN STENOSIS

Conclusion

• Ch-TEVAR unquestioned values:
  - Urgency/Emergency, Custom SG Limitations, Rescue

• Ch-TEVAR major limits:
  - Stroke, T1EL/Gutters, Parallel Graft Patency

• Standardizations & new materials (i.e. new C-TAG) →
  keystone to reduce complications