

CHEVAR

for the management of hostile neck AAA

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Triumph Luxury Hotel
Cairo, Egypt

The ideal aortic neck anatomy

- The infrarenal neck must be:
 - a minimum of 10 to 15 mm in length
 - 17 to 32 mm in diameter
 - absent of reverse taper configuration
 - the suprarenal and infrarenal angulation is $< 60^\circ$
 - the aortic wall should be void of significant calcium or thrombus
- **If not -----Hostile Neck**

ChEVAR

*Chimney or
Snorkel or
parallel grafts
technique*



The concept

- Many reports on ChEVAR describe the benefit of additional neck length gained of fixation for better sealing.
- Gargiulo and colleagues demonstrated that aortic neck dilatation over follow up differed at distinct levels of the aorta.
 - at the level of the lowest renal artery was 11%
 - above renals <3%
- suggesting that a more durable endovascular approaches should involve proximal fixation and sealing into a healthier segment of perivisceral aorta.
- Gargiulo M, Gallitto E, Watzel H, et al. Outcomes of endovascular aneurysm repair performed in abdominal aortic aneurysms with large infrarenal necks. J Vasc Surg. 2017;66:1065-1072.

ChEVAR advantages

- The off-the-shelf availability
- Less complex procedure (less operative & fluoroscopy time)
- Anatomic features not favoring FEVAR such as:
 - Narrow or tortuous iliofemoral access
 - Downward angulated renal arteries
 - Angulated visceral aortic segment.
- Lee JT, Lee GK, Chandra V, et al. Comparison of fenestrated endografts and the snorkel/chimney technique. J Vase Surg. 2014;60:849-856.
- Ullery BW. Snorkel/chimney versus fenestrated endovascular aneurysm repair: what works and when? Endovasc Today. 2016;15:76-81.

ChEVAR drawbacks

- The risk of type Ia endoleak due to **gutter formation** between the endograft and chimney grafts
- Anatomic limitations such as:
 - upper extremity difficult access
 - upward direction of renal arteries
- Ullery BW. Snorkel/chimney versus fenestrated endovascular aneurysm repair: what works and when? Endovasc Today. 2016;15:76-81.

PERICLES Registry

- The PERICLES registry represents the largest collected worldwide multicenter experience with ChEVAR
- Included 898 chimney grafts in 517 patients, and the mean follow-up was 17.1 months.
- A 30-day mortality rate of 4.9% was reported (3.7% when ruptured AAAs were excluded)
- Technical success was 97.1%
- 2.9% type Ia endoleak at the end of the procedure, although only 0.4% of type Ia endoleak persisted at the first follow-up CT, and only 0.6% late onset type Ia endoleak.
- Donas KP, Lee JT, Lachat M, et al. Collected world experience about the performance of the snorkel/chimney endovascular technique in the treatment of complex aortic pathologies: the PERICLES registry. Ann Surg. 2015;262:546-S53.

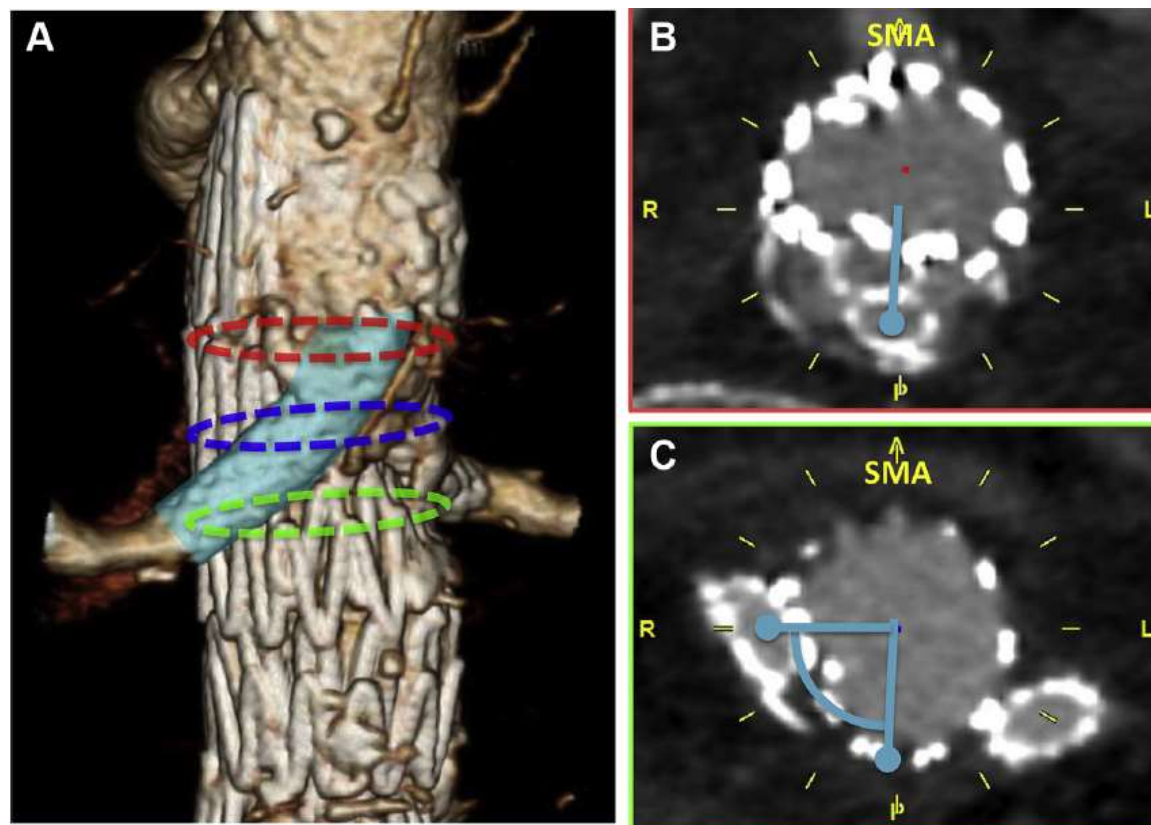
Midterm outcomes and evolution of gutter area after endovascular aneurysm repair with the chimney graft procedure

- **Take Home Message:** The use of chimney grafts is associated with early primary clinical success in 79% of patients with 2-year midterm actuarial survival of 78% and freedom from aneurysm growth of 84%
- *Hector W. L. de Beaufort, Elena Cellitti, Quirina M. B. de Ruiter, Michele Conti, Santi Trimarchi, Frans L. Moll, Constantijn E. V. B. Hazenberg, Joost A. van Herwaarden, Utrecht, The Netherlands; and San Donato Milanese and Pavia, Italy. Journal of Vascular Surgery. Volume 67, Number 1, January 2018*

Polar orientation of renal grafts within the proximal seal zone affects risk of early type IA endoleaks after chimney endovascular aneurysm repair

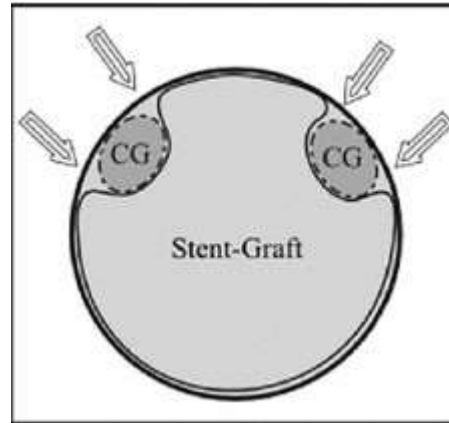
Recommendation: This study suggests that chimney grafts that traverse >90 degrees in polar angle within the seal zone may be at increased risk of early type IA endoleaks.

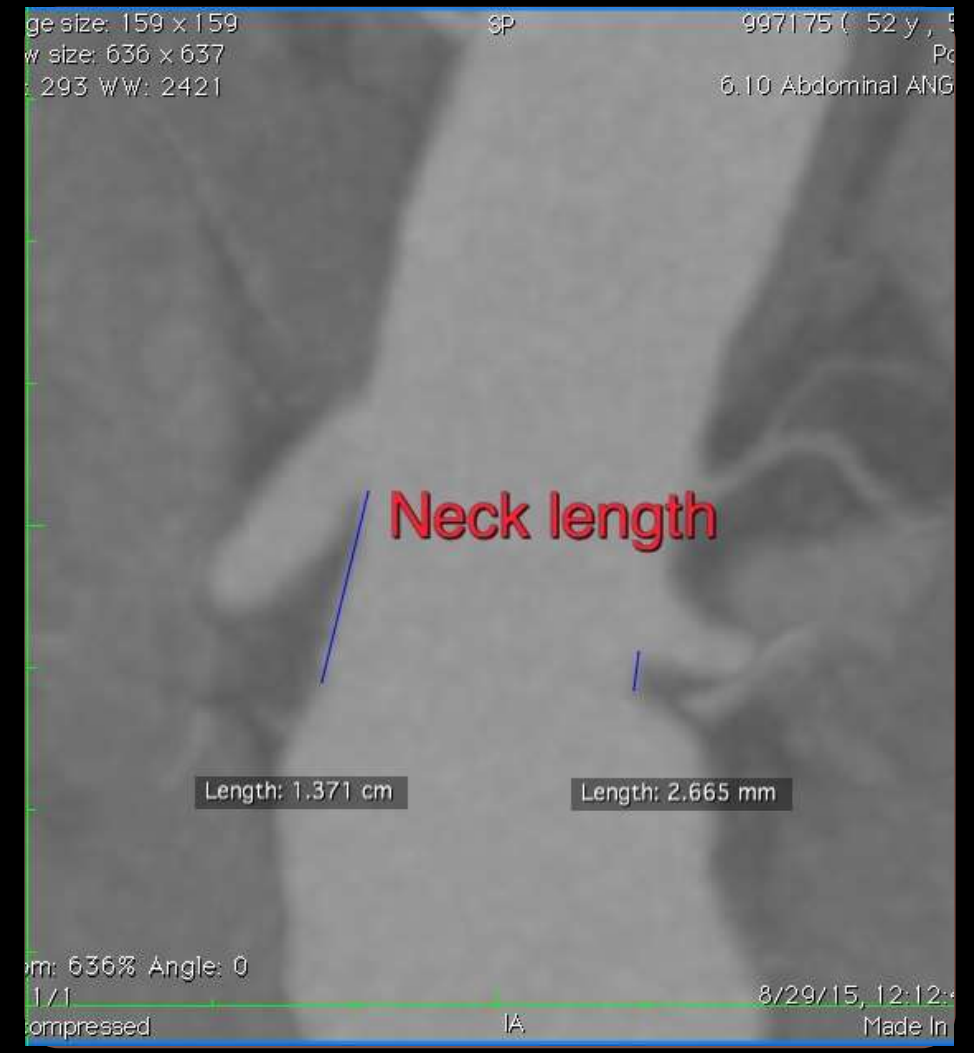
Kenneth Tran, Brant W. Ullery, Nathan Itoga, and Jason T. Lee, Stanford, Calif. Journal of Vascular Surgery Volume 67, Number 4. April 2018



How to avoid guttering?

- 25-35% oversizing
- 15-20mm sealing zone
- Perpendicular trajectory of renal stent grafts
- Triple-kissing balloon molding between the aortic and chimney stent-grafts





P10:35_18.10.15

Ain Shams Specialize

PAT184

Vascular Surg

1450

DSA_E

NR 8

LIH 1

R 180°

W 45 L 50

18.10.2015

12:07:28

HQ

DSA_E

MAG 0

kV 100

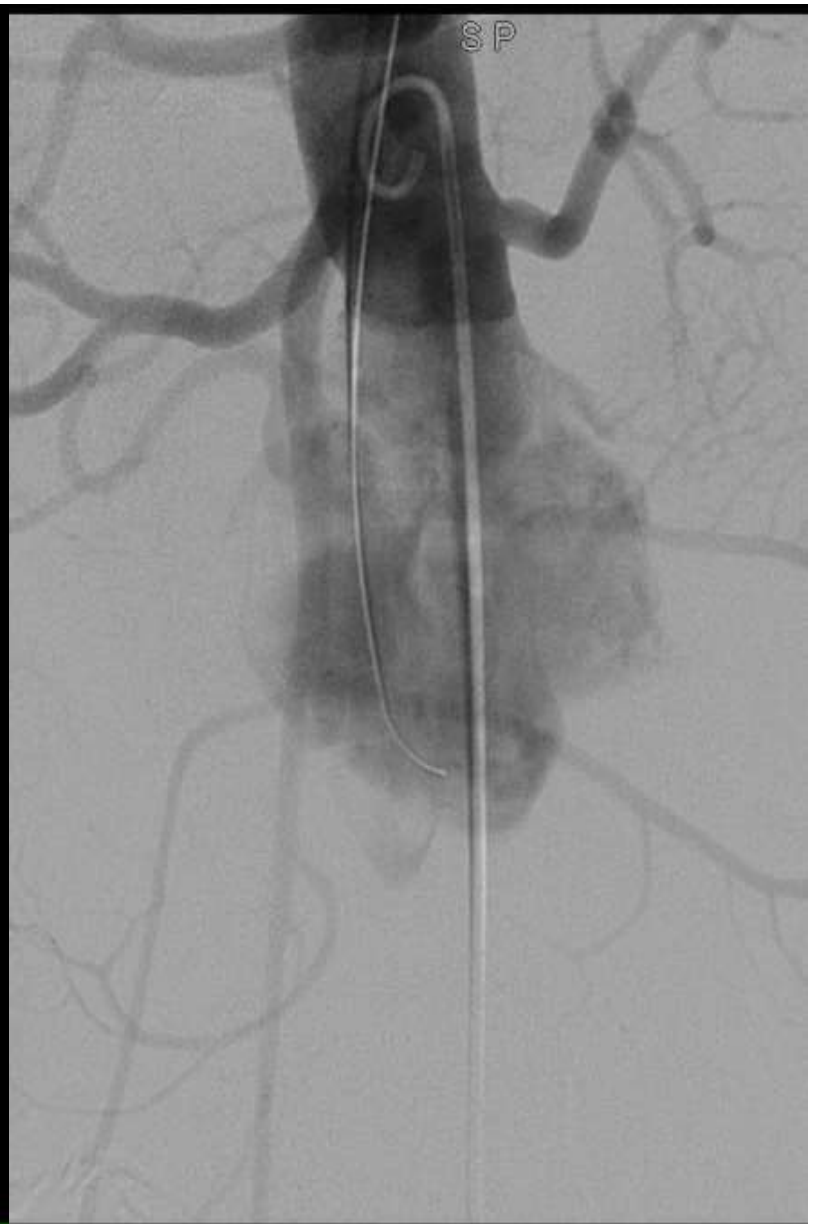
mA 55.0

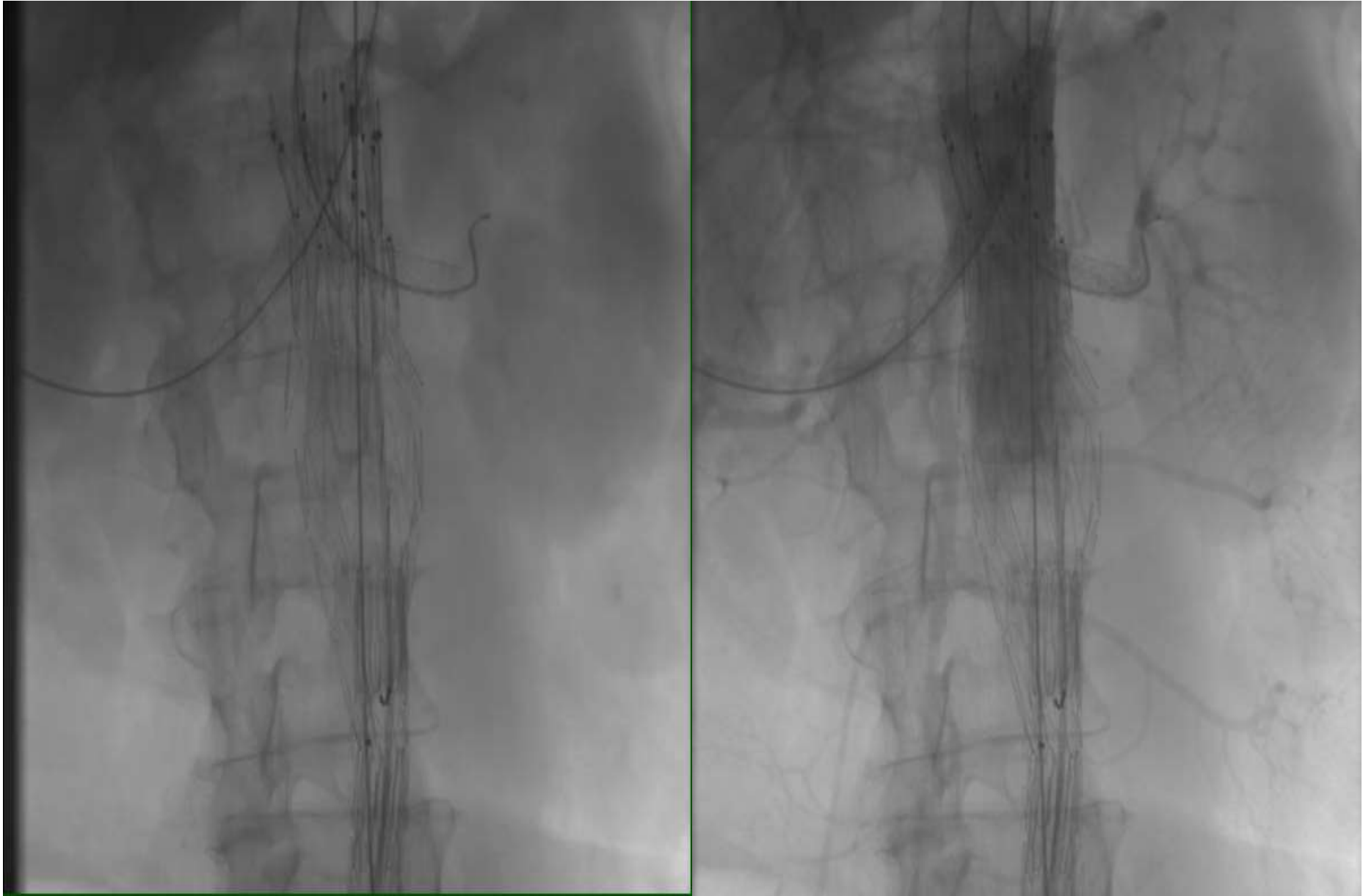
cGy cm²

57166.22

min 70:44







ChEVAR VS FEVAR

- Yaoguo et al evaluated 42 studies published until 2015 and included a total of 2,264 patients for ChEVAR and FEVAR
- the 30-day mortality rate was 2.4% vs 3.2% (P = .46)
- target vessel stenosis or occlusion rate was 3.4% vs 3.6%. (P = .79)
- type I endoleak occurred in 3.4% vs 2% (P = .09)
- reinterventions were 5.6% vs 11.7% (P = .001)
- the aneurysm-related mortality rate was 3.2% vs 1.4% (P = .02)
- Lower operative and fluoroscopy time, contrast use, and blood loss were reported for ChEVAR
- Yaoguo Y, Zhong C, Lei K, Yaowen X. Treatment of complex aortic aneurysms with fenestrated endografts and chimney stent repair: systematic review and meta-analysis. Vascular. 2017;25:92-100.

ChEVAR conclusion

The off-the-shelf availability, technical easiness, anatomical advantages together with the good results

of ChEVAR

justify its role in the treatment of AAAs with compromised necks, especially in semi-acute cases.

**THANK
YOU**

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