The GOOD solution for the BAD conditions and the UGLY anatomy

Angulated neck

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Disclosure of Interest

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Speaker name: Colin Bicknell.

I have the following potential conflicts of interest to report:

- Consulting – Medtronic, Bolton Medical, Orzone
- Other(s) – Institutional level funding, Orzone

The NICE solution for the BAD conditions and the UGLY anatomy: Angulated neck

NICE National Institute for Health and Care Excellence

"Do not offer EVAR to patients who are not fit for open surgery"

The BAD condition

78 y.o. female patient

Presenting with and expanding sac that has grown 9mm in one year.

Comorbidities:
Previous MI, stenting
Cholecystitis
Hypertension
High Cholesterol
Type 2 Diabetes

The UGLY anatomy

69mm infrarenal AAA

Angulated neck 85degrees

15mm in length

Diameter 22mm neck

Occluded left renal artery, severe stenosis o
right renal artery

Access 7mm CIA both sides

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Challenges

Stenting of right renal artery?
When?
Safety wire?

Conservative approach (BREXIT / NICE option)
Standard stent graft
ChEVAR
Fenestrated stent
Open approach

Which device if standard stent graft?

SINGLE RIGHT RENAL ARTERY STENTING

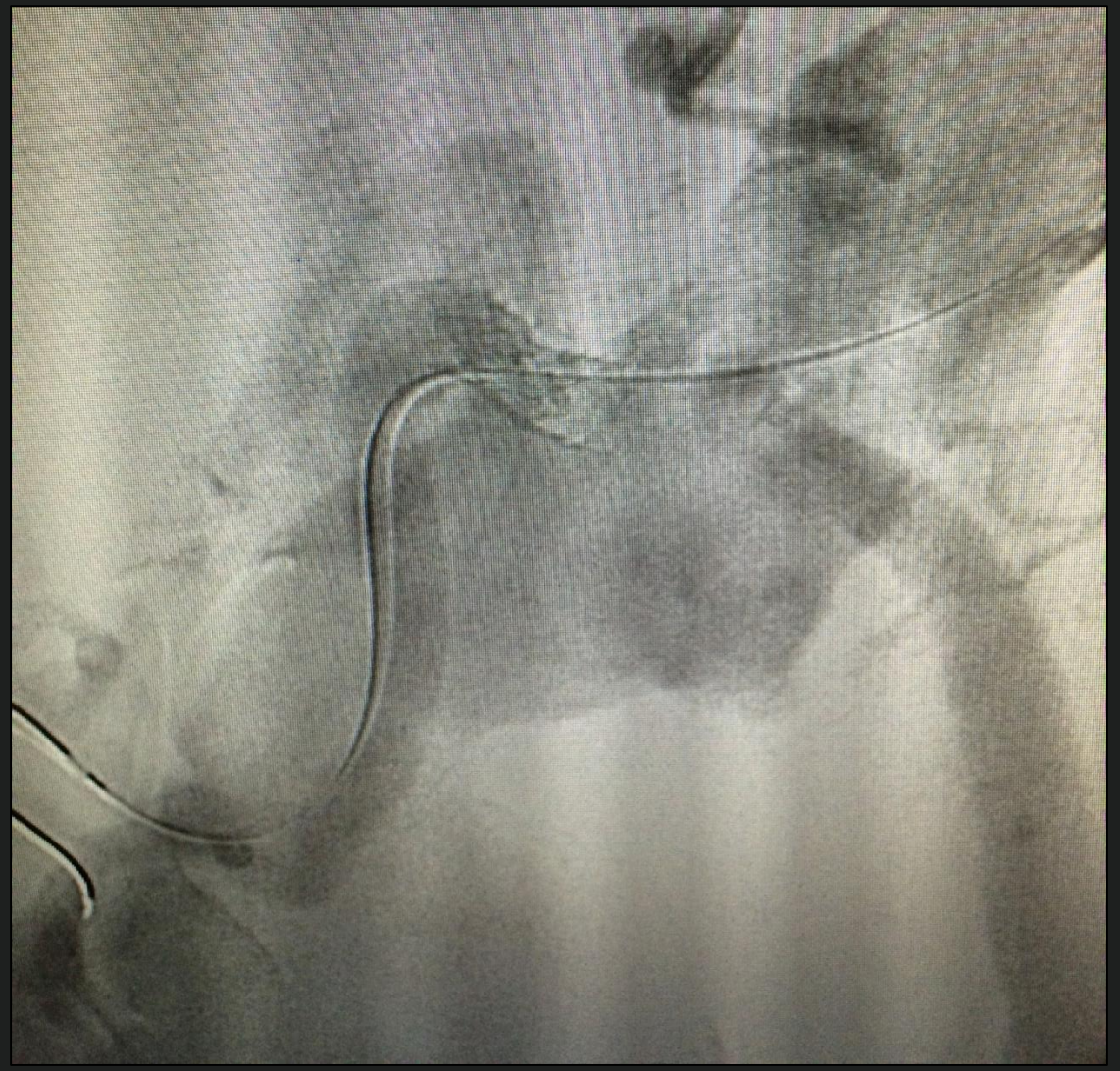
Controversy exists as to whether stenting the single tight RAS will prevent renal failure, reduce HT or improve renal function….but it will:

Avoid renal artery closure during EVAR

Visualization during stenting in angulated neck

Do beforehand, under LA and predictable EVAR procedure

During the procedure can use the balloon/stent to ensure full landing zone of EVAR used



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Fenestrated EVAR

- 13 juxtarenal/extent IV TAAAs
- Nine cases >60 degrees angulation
- F/U 1-2 years

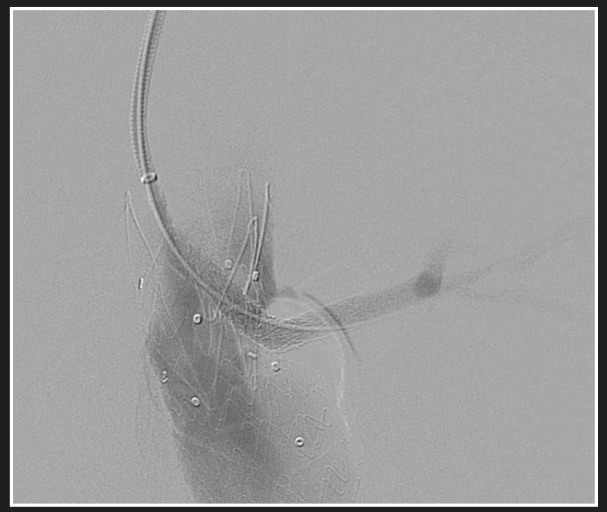
- No type I or III endoleak.
- One left renal artery occlusion.
- One access site complication reoperation
- One death IHD 77 weeks after the procedure.

J Vasc Surg. 2014 Mar;59(3):615-22.

Experience with a novel custom-made fenestrated stent graft in the repair of juxtarenal and type IV thoracoabdominal aneurysms

Alexander E. Rolls, MRCS,[a] Michael Jenkins, MS, FRCS,[a] Colin D. Bicknell, MD, FRCS,[a] Celia V. Riga, MD, MRCS,[a] Nick J. Cheshire, MD, FRCS,[a] Nick Burfitt, FRCR,[b] and Mohamad Hamady, MD, FRCR,[b] *London, United Kingdom*

Ch-EVAR



Case Report

http://dx.doi.org/10.4070/kcj.2013.43.6.416
Print ISSN 1738-5520 • On-line ISSN 1738-5555

kcj
Korean Circulation Journal

A Case of Abdominal Aortic Aneurysm with Short Angulated Proximal Neck Treated with the Chimney Graft Technique

Sangeun Lee, MD[1], Young-Guk Ko, MD[1], Donghoon Choi, MD[1], and Do-yun Lee, MD[2]

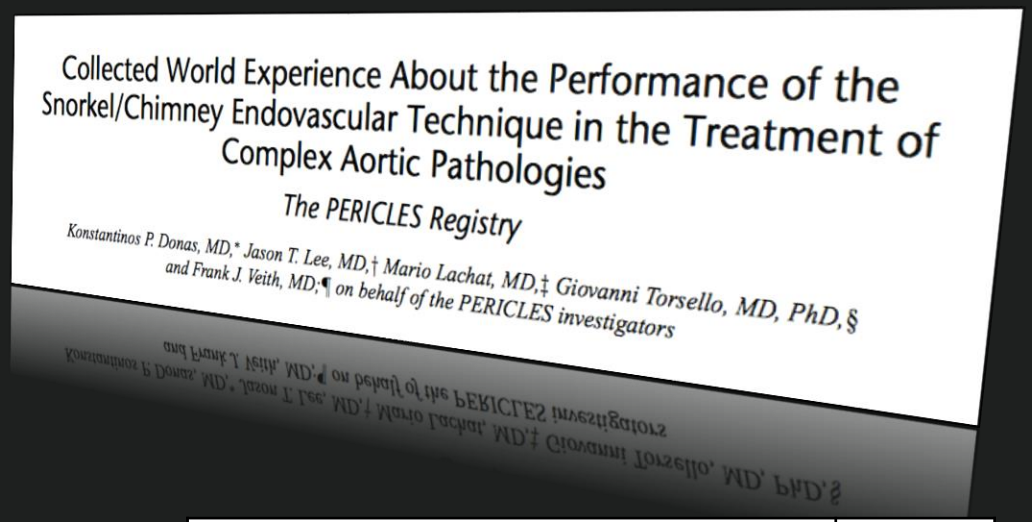
[1]*Division of Cardiology, Severance Cardiovascular Hospital, Yonsei University Health System, Seoul,*
[2]*Department of Radiology, Severance Hospital, Yonsei University Health System, Seoul, Korea*

PERICLES

- Retrospective
- 517 patients treated by ch-EVAR from 2008-2014
- Mean follow-up of 17.1 months (range: 1-70 months)
- Primary patency 94%, secondary patency 95.3%.

Results affected by:

- Conformity technique
- Device sizing
- Device selection



Collected World Experience About the Performance of the Snorkel/Chimney Endovascular Technique in the Treatment of Complex Aortic Pathologies

The PERICLES Registry

Konstantinos P. Donas, MD, Jason T. Lee, MD,† Mario Lachat, MD,‡ Giovanni Torsello, MD, PhD,§ and Frank J. Veith, MD,¶ on behalf of the PERICLES investigators*

Intra-op type Ia endoleak:	7.9%
Persistent intra-op type Ia endoleak:	2.9%
Type IA endoleak at latest FU:	5.8%
Technical Success	97%

…for 517 patients from 13 international centers

EVAR in angulated necks

45 highly angulated cases - 65 matched controls

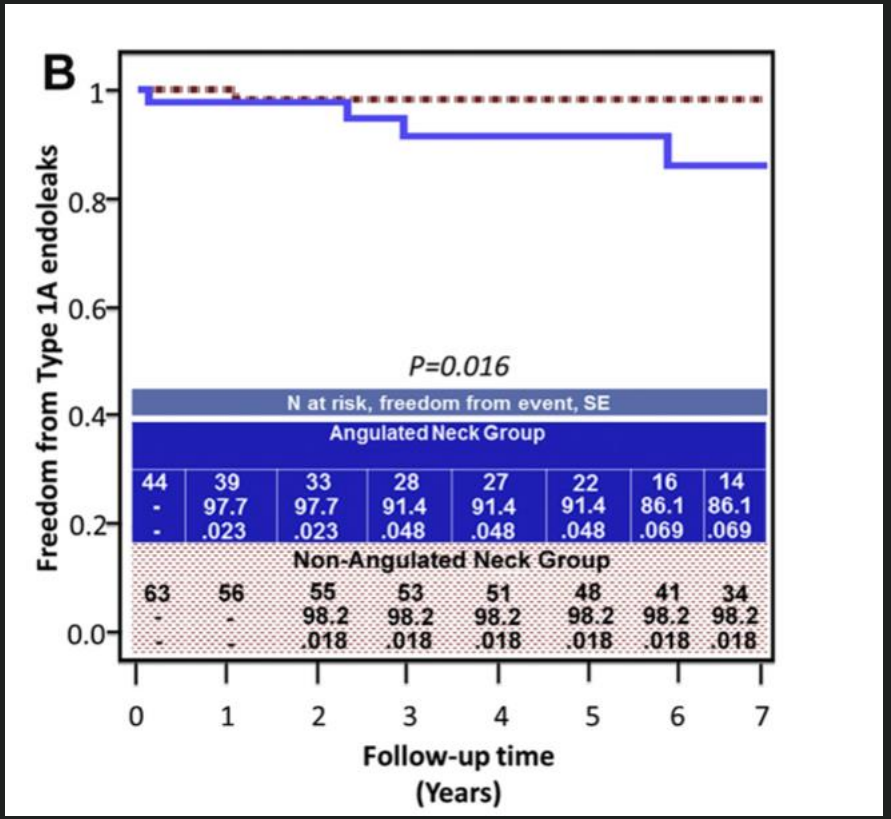
Median follow up of 7.4 years

At 7 years:

- Freedom from type 1a endoleak was 86.1% vs 96.6%
- five patients in the angulated neck group and two nonangulated patients developed type 1a endoleak

No difference in mortality

“These findings suggest that EVAR should be used judiciously in patients with extreme angulation of the proximal neck and highlight the need for close follow-up of EVAR”



J Vasc Surg. 2018 Dec;68(6):1725-1735. *Long-term outcomes of standard endovascular aneurysm repair in patients with severe neck angulation.* Oliveira NFG et al

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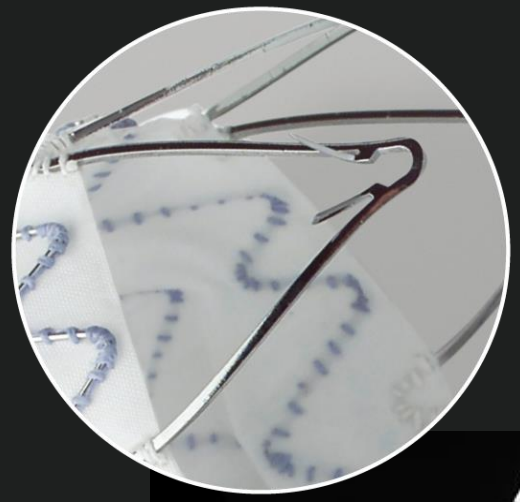
Standard EVAR – Which graft?

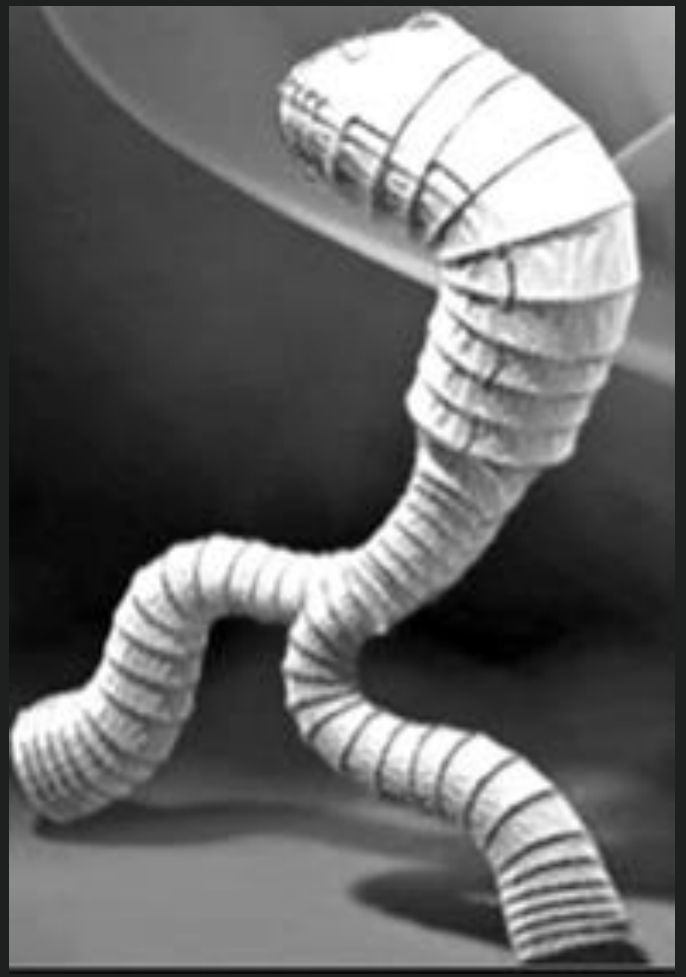


J Vasc Surg. 2017 Jun;65(6):1598-1607. *Five-year outcomes of the PYTHAGORAS U.S. clinical trial of the Aorfix endograft for endovascular aneurysm repair in patients with highly angulated aortic necks.* Malas et al

218 patients for a total of 5 years. - 151 in a highly angulated group (mean 83 degrees)

- No type I or type III endoleak in either group
- 3% migration in angulated group
- 4% sac expansion in group I vs 15.0% in group II (P ≥ .27).

The 5-year freedom from all-cause mortality was 69%



Technique

Cardiovasc Intervent Radiol. 2018 Apr;41(4):554-563.
Clinical Outcomes of Endovascular Aneurysm Repair with the Kilt Technique for Abdominal Aortic Aneurysms with Hostile Aneurysm Neck Anatomy: A Korean Multicenter Retrospective Study. Jeon et al

24 patients (mean age 71 ± 11 years; >60 degree angulation; mean follow-up 50 ± 12 months) between 2010 and 2015.

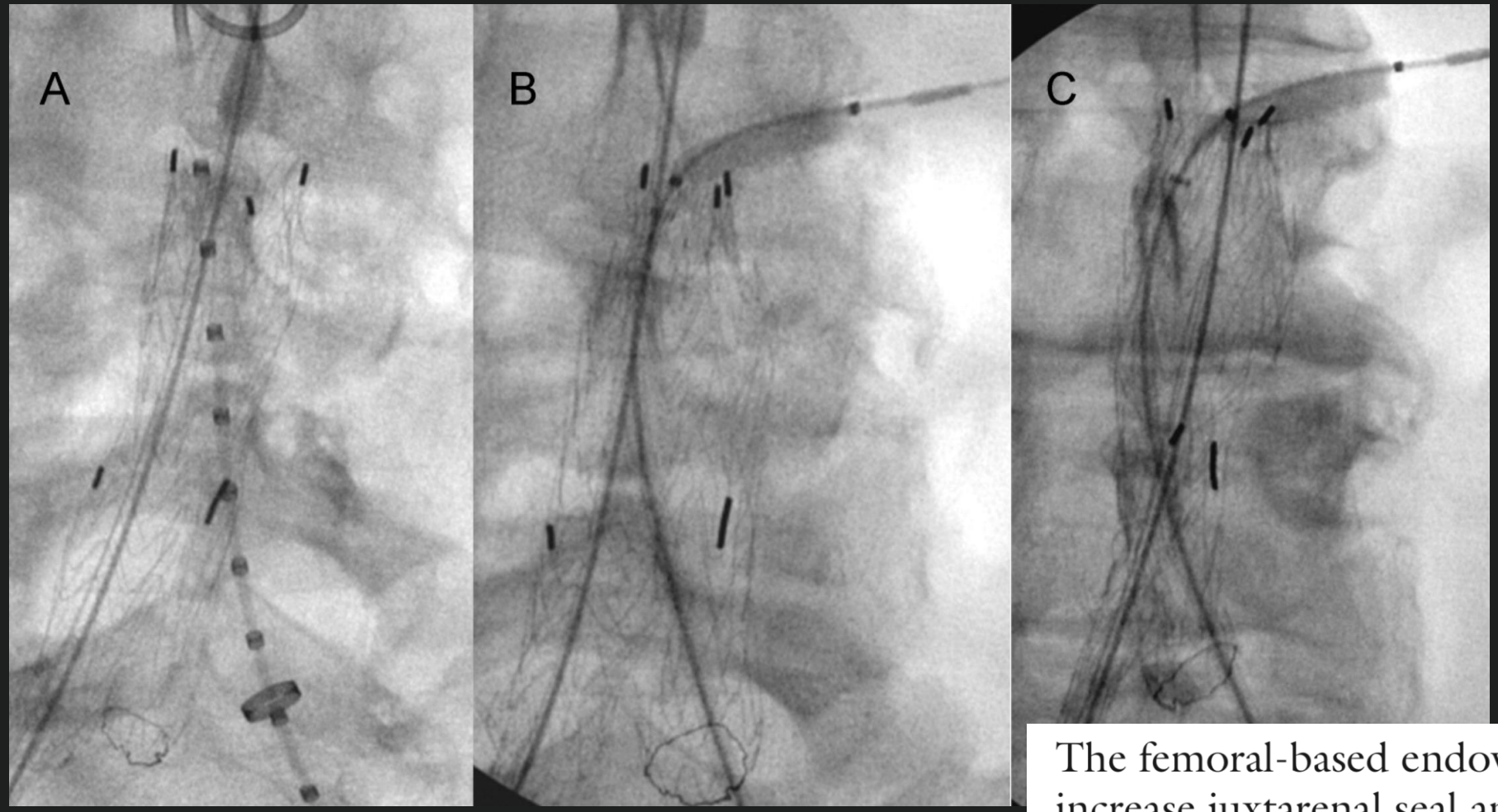
The survival rate was 96 ± 8% at 1 month, 6 months, 1 year, and 3 years, and 87 ± 18% at 5 years.

Endoleaks occurred in three patients.

Kilt Technique as an Angle Modification Method for Endovascular Repair of Abdominal Aortic Aneurysm with Severe Neck Angle

Tae-Hoon Kim, MD, PhD,[1] Ho-Jun Jang, MD,[1] Young Jin Choi, MD, PhD,[1] Chang Keun Lee, MD,[2] Sung Woo Kwon, MD,[3] and Won-Heum Shim, MD, PhD[1]

Technique: Endowedge



The femoral-based endowedge technique to increase juxtarenal seal and correct graft tilt

David J. Minion, MD, and Eleftherios S. Xenos, MD, *Lexington, Ky*

J Vasc Surg. 2012 May;55(5):1522-5.

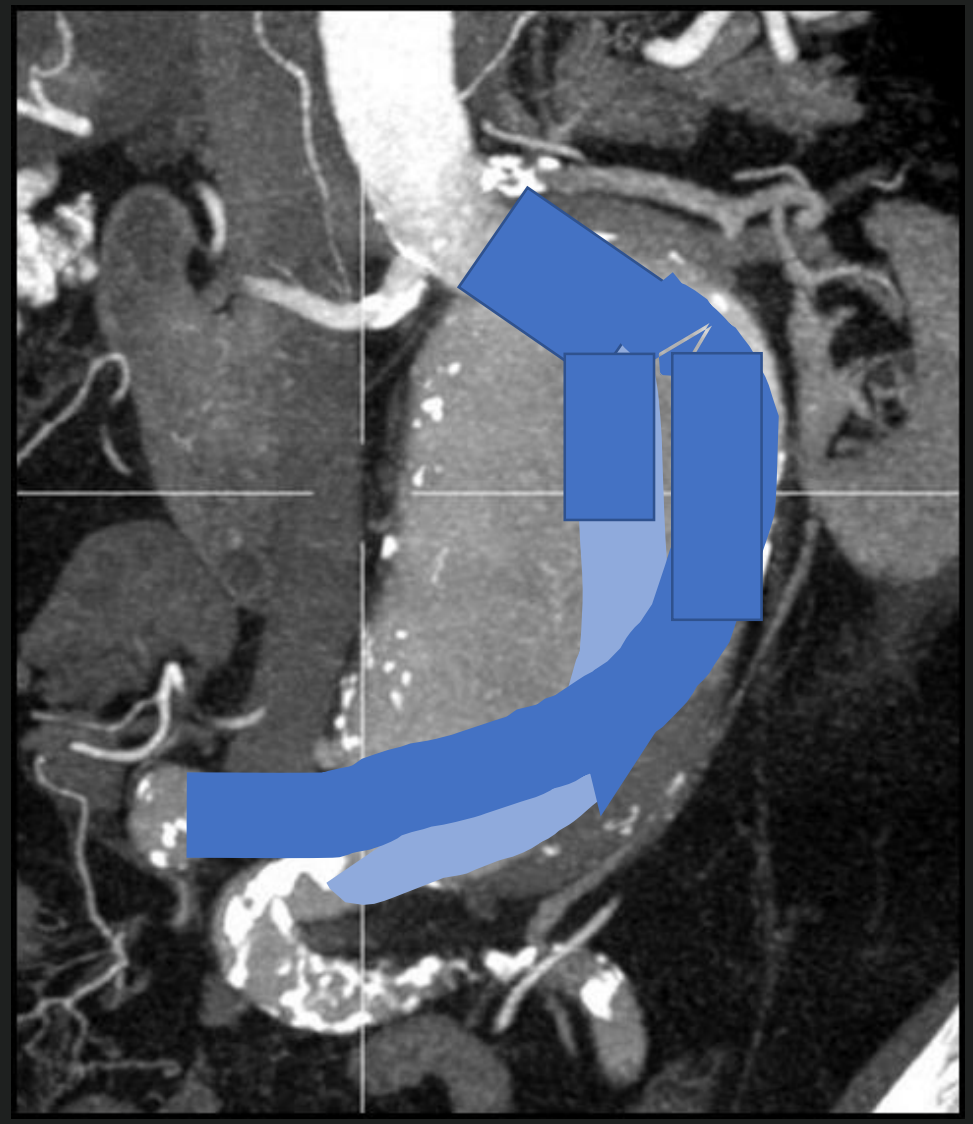
Technique:
Cannulation and limb considerations

Often a large sac, normal configuration and SOS

…or Ballerina and less limb kinking

Repositionable device may be useful

Robotics



GORE C3 – infrarenal and repositionable - EVAR device placed

Repositioned

Unable to position adequately

Significant type 1 endoleak

ANCHOR Registry – Therapeutic Use for Proximal ELs

TECHNICAL SUCCESS

Deployment of desired number of EndoAnchor™ implants without fracture or loss of integrity

PROCEDURAL SUCCESS

Technical success without type Ia endoleak at completion arteriography

ANCHOR Registry now reporting three year data

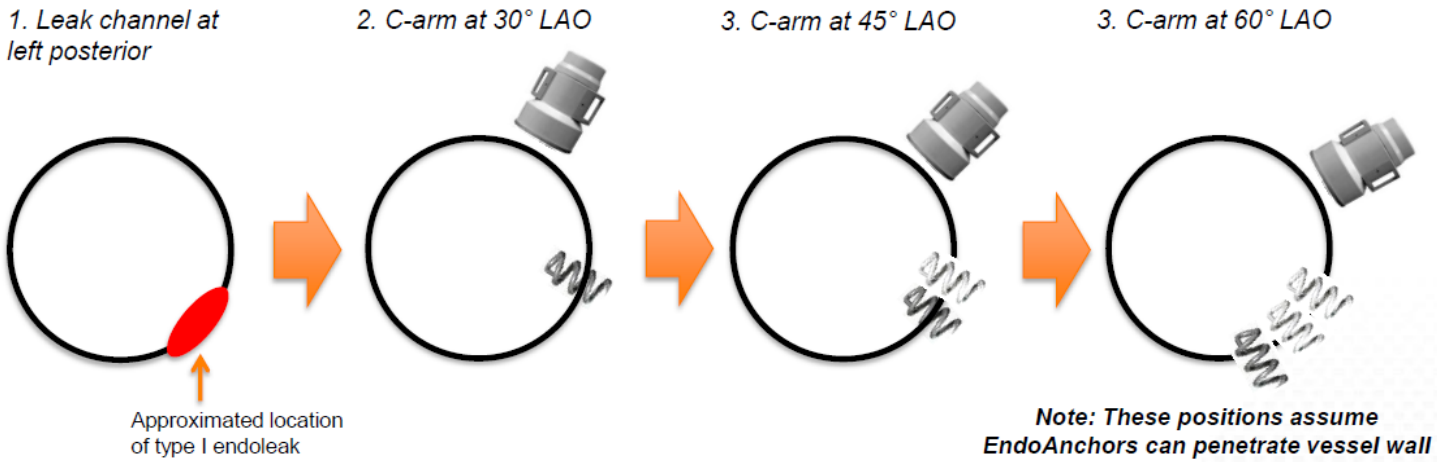
Freedom from aneurysm related mortality in therapeutic type 1 endoleak treatments by Kaplan-Meier estimates is 98.4%

OPERATIVE ENDOANCHOR PLACEMENT

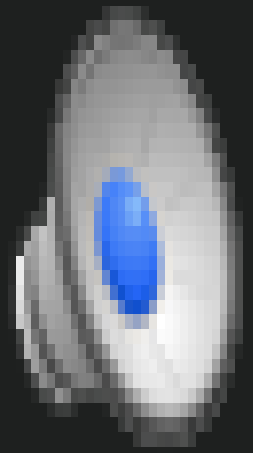
- Identify leak channel - CT evaluation or triangulate leak channel with angiography
- Fix side away from endoleak first
- Row of staples across endoleak and often another row below

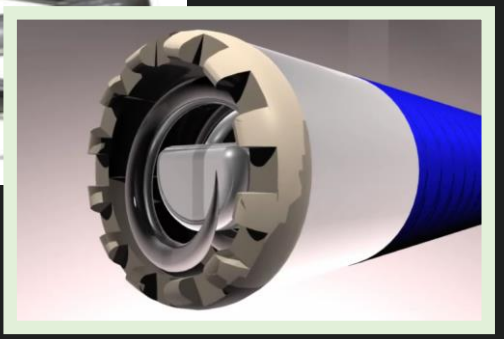
- Identify leak channel and then create a “suture line” along wall.
  - Move C-Arm in 15-20° increments

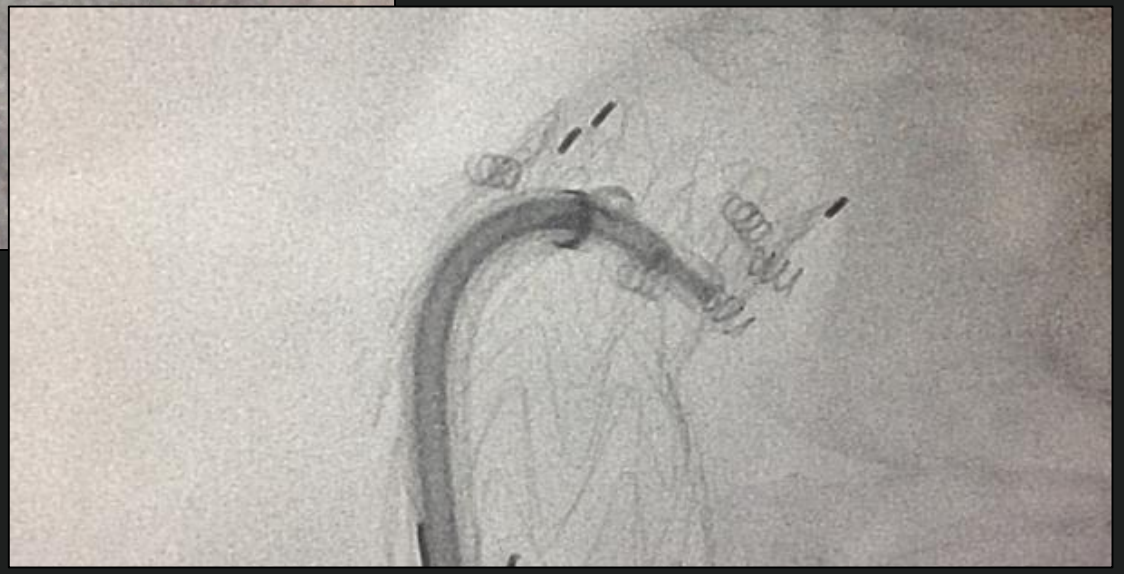
Example of C-arm orientations for treating leak channel at left posterior



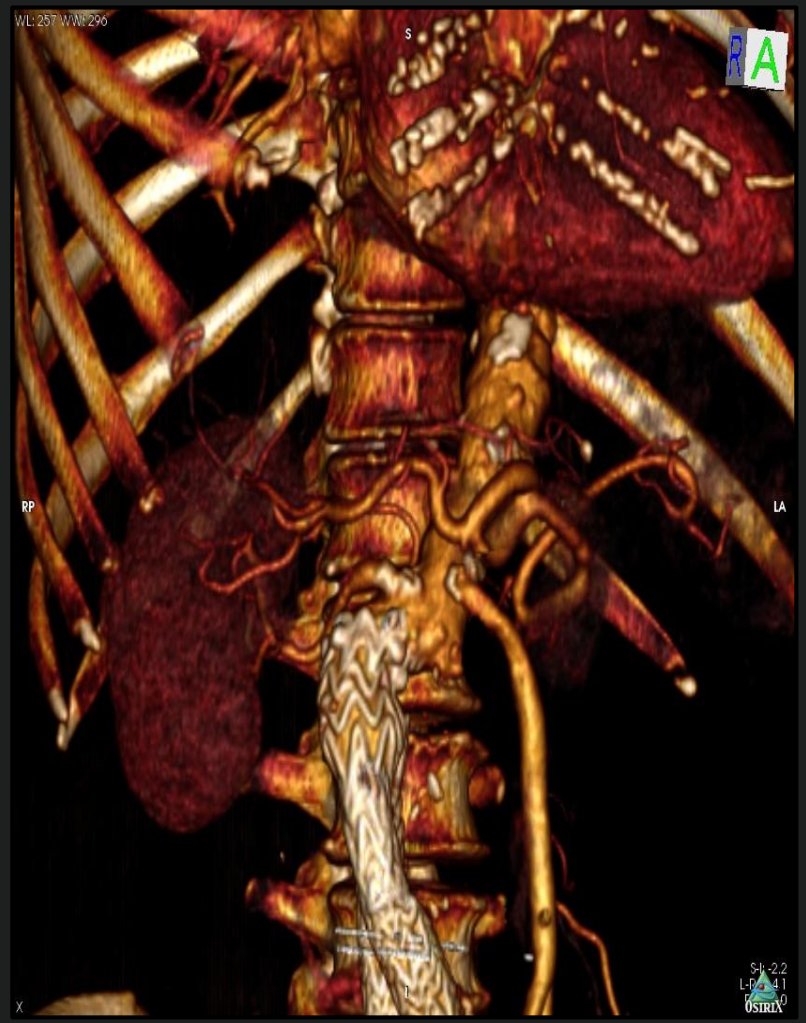
- Placement of EndoAnchors around the neck circumference before or after T1 EL treatment is recommended







Completion angiogram and 3 year CT study



WAS IT GOOD?:

Well
No renal compromise
Home mobilising day 3

CT Follow up:

No type 1 endoleak
Small type 2 endoleak

Further follow up:

Sac size stable
Endoleak persistent

Died three years after the EVAR from cholecystitis