

How to deal with Type 1 endoleaks

PROXIMAL NECKS STILL CHALLENGE EVAR

meta-analysis by Stather et al. of 16 major studies confirms
higher risks in hostile necks

Total sample size: N=11,959 patients

Outcome	N	Hostile Neck	Favorable Neck	Odds Ratio (95% CI)	p
30-Day: All studies					
Primary technical success	6	1036 (96.8%)	3497 (98.3%)	0.45 (0.19, 1.06)	0.07
Intraoperative adjuncts	5	991 (15.4%)	3199 (8.8%)	1.88 (1.15, 3.07)	0.01
Stent-graft migration	4	1245 (1.6%)	4225 (0.9%)	2.08 (1.20, 3.62)	0.009
Outcome	N	Hostile Neck	Favorable Neck	Odds Ratio (95% CI)	p
All Studies					
Early type I	8	1290 (6.5%)	3849 (4.0%)	2.92 (1.61, 5.30)	0.0004
Early type II	3	867 (8.5%)	3106 (10.8%)	0.74 (0.56, 0.97)	0.03
Late type I	8	2454 (7.1%)	7719 (3.8%)	1.71 (1.31, 2.23)	<0.0001
Late type II	6	1292 (9.1%)	3617 (10.5%)	0.74 (0.55, 0.99)	0.05

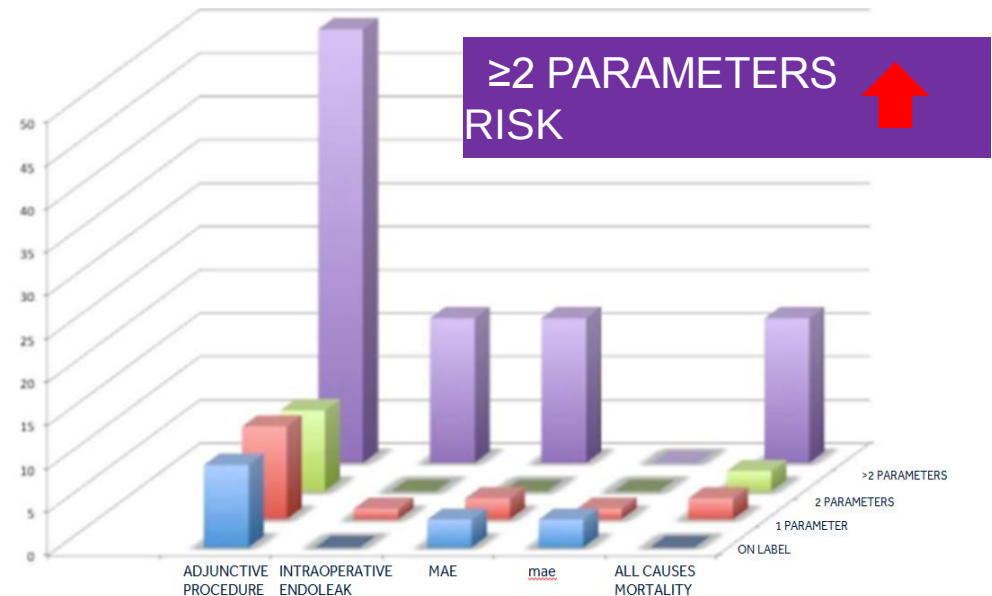
- Further substantiation that EVAR still faces significant challenges in hostile proximal neck anatomy

Stather et al. J EVT. 2013;20:623–637

Influence of multiple hostile neck parameters

Speziale et al. shows greater proximal seal complication risks as the number of hostile neck parameters increases

<u>Neck hostility</u>	<u>Intra-op adjunctive procedures</u>	<u>Intra-op endoleaks</u>	<u>All cause mortality</u>
On label	9.9%	0.5%	1.1%
2 hostile neck parameters	26.7%	6.7%	13.3%
>2 hostile neck parameters	50%	16.7%	16.7%

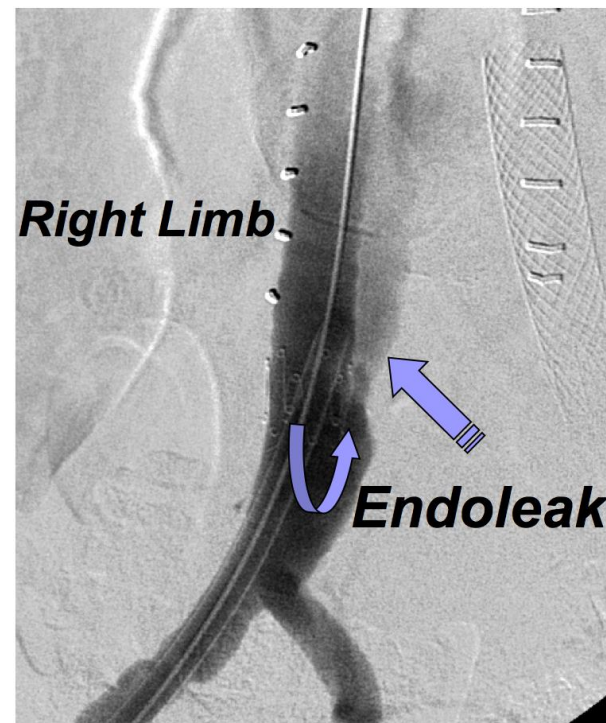
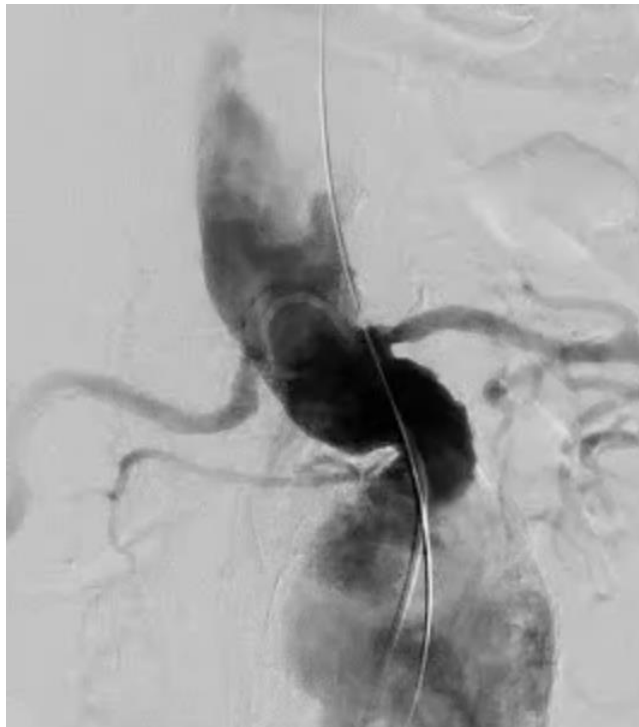


Greater than 1 hostile neck parameter *substantially* increases mortality, major adverse events, intra-op endoleaks and adjunctive procedures

Speziale et al, Annals VS. 2014

Type 1 Endoleak

- When you push the anatomy
- When the device has been in place a long time





Aneurysm Rupture after EVAR: Can the Ultimate Failure be Predicted?

F.J.V. Schlösser^a, R.J. Gusberg^a, A. Dardik^a, P.H. Lin^b, H.J.M. Verhagen^c,
F.L. Moll^d, B.E. Muhs^{a,*}

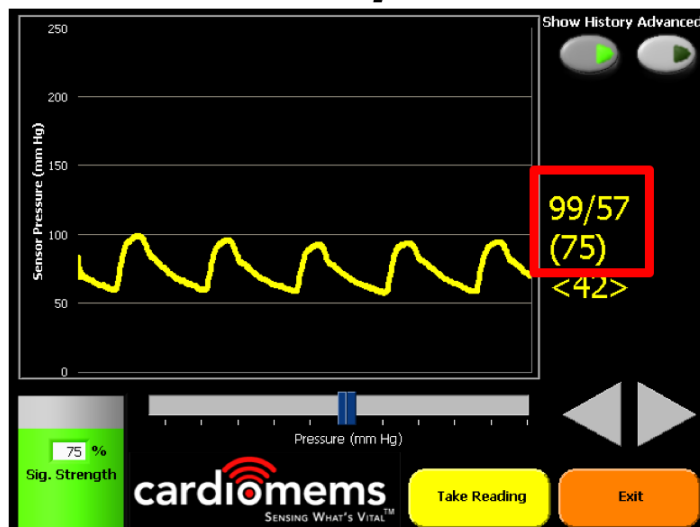
World Review of Ruptures after EVAR

55% (129/235) of All Ruptures

are due to Type I endoleaks

38 of the ruptures in the first 30 days

Before Implantation



Type I endoleak



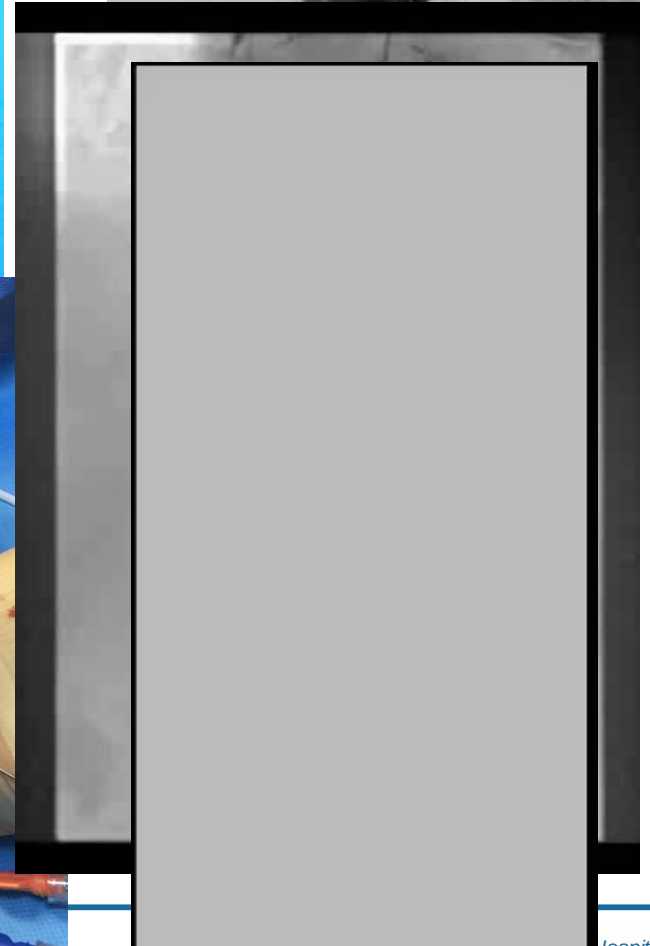
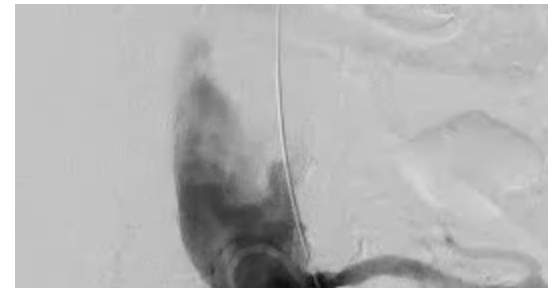
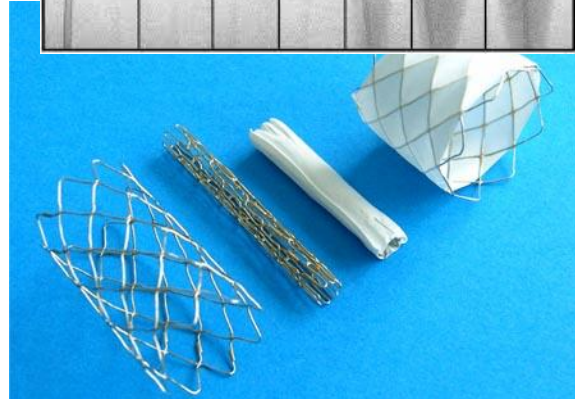
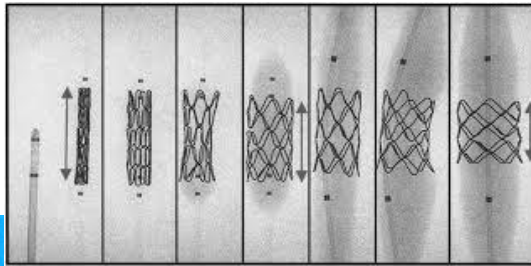
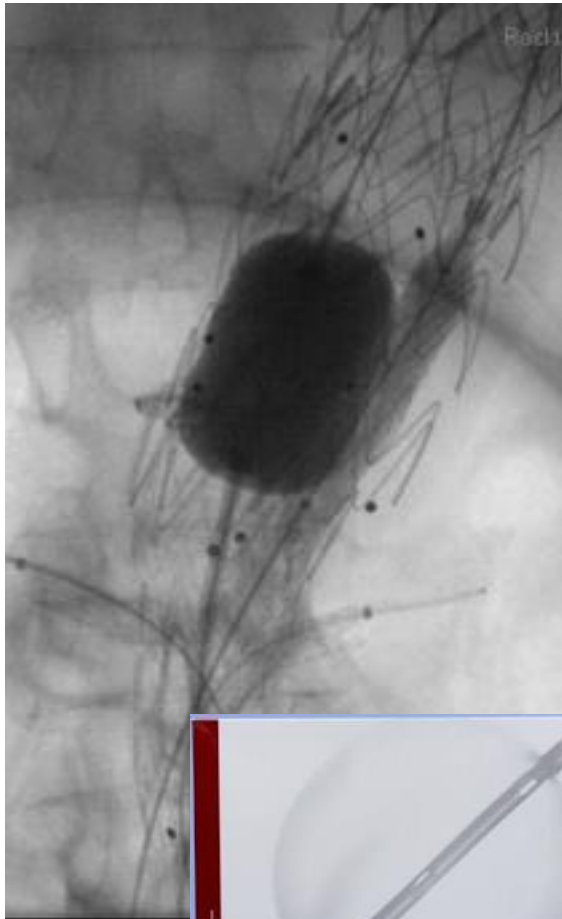
Endovascular Rx of Type I

Endoleaks

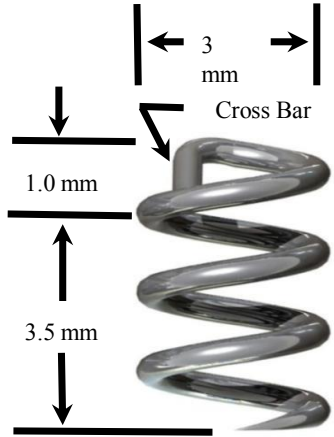
- *Ballooning +/- higher pressure*
- *Giant Palmaz stent*
- *Stent extension*

- *Endostaples*
- *Chimneys*
- *Coils +/- glue to track*

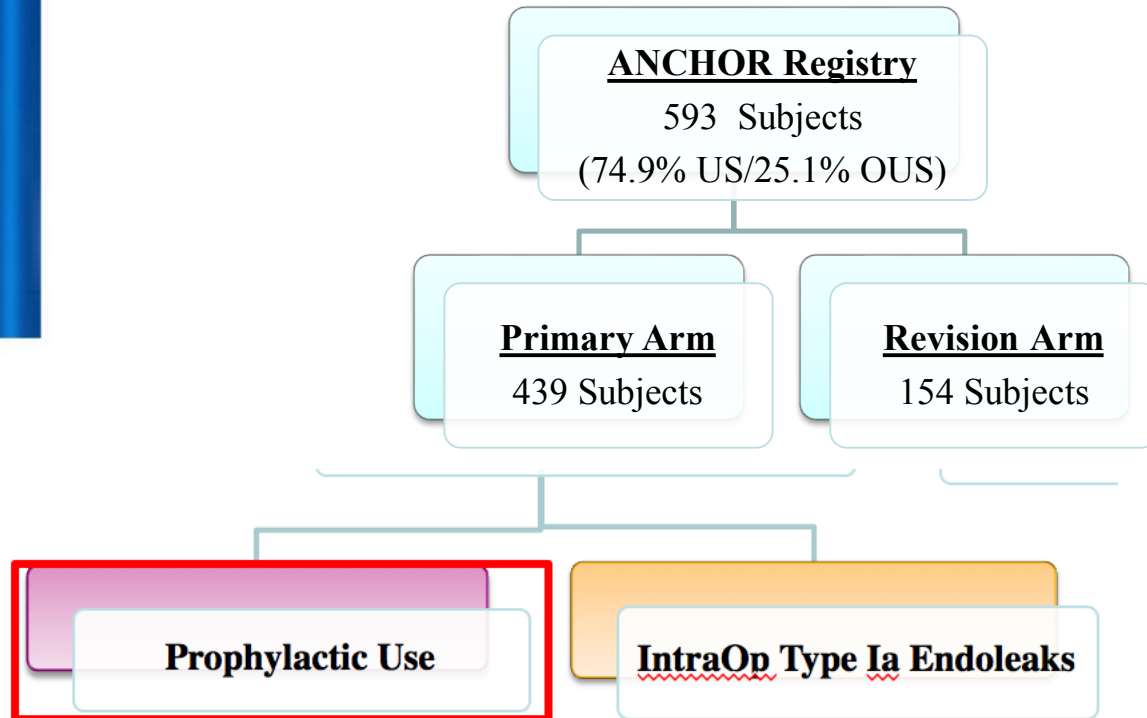
*Rarely Open Conversion is required
(high mortality and morbidity)*



Heli-FX System: Applier + Guide + 10 EndoAnchors



ANCHOR Registry – Enrollment Status



ANCHOR Registry – Prophylactic Subjects

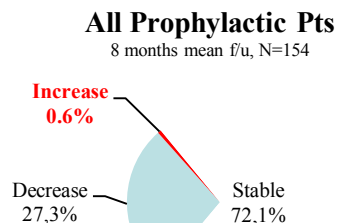
INDEX PROCEDURE AND HOSPITALIZATION*

Technical Success Deployment of desired number of EndoAnchors without fracture or loss of integrity	94.8%
Procedural Success Technical success without type Ia endoleak at completion arteriography	92.2%

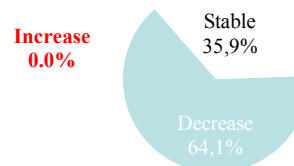
MEAN FOLLOW-UP 8.2 MONTHS

Type Ia Endoleaks	1.7% (3/177)
Endograft Migration (>10mm)	0.0% (0/112)

Migration was assessed in comparison to the 1-month CT scan



Prophylactic Pts with 1-Year CTs
N=39



Analysis includes only patients with a 1-month CT and at least one more CT after 1 month.



ANCHOR Registry – Therapeutic Use for Proximal ELs

INDEX PROCEDURE AND HOSPITALIZATION*

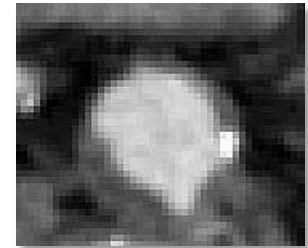
	Primary	Revision
Technical Success Deployment of desired number of EndoAnchors without fracture or loss of integrity	95.7%	93.4%
Procedural Success Technical success without type Ia endoleak at completion arteriography	85.1%	82.8%

PERSISTENT/RECURRENT TYPE Ia ENDOLEAKS

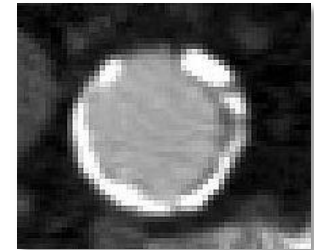
	All Cases		
	1a ELs	CTs	%
All	24	142	16.9%
Primary	3	76	3.9%
Revision	21	66	31.8%

Limitations of endoanchors

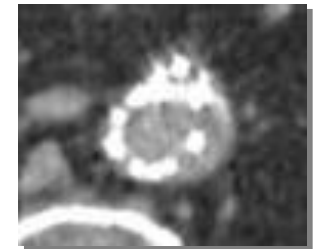
- Not recommended in proximal necks where thrombus, calcification and/or plaque is greater than 180° in target area
- Irregular or eccentric thrombus, calcification and/or plaque that may compromise EndoAnchor penetration
- Attaching multiple components and/or layered endografts without aortic penetration
- Bridging an endoleak gap if the native aorta has dilated beyond the max diameter of the endograft



Excessive Thrombus in Aorta



Excessive Calcification in Aorta

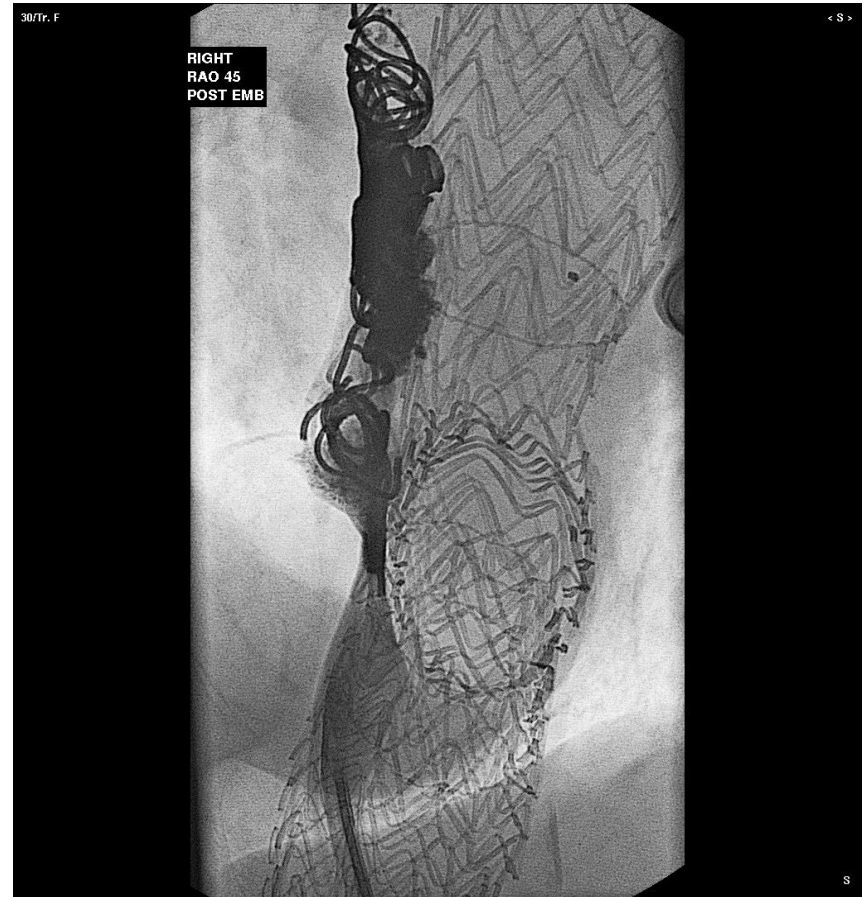
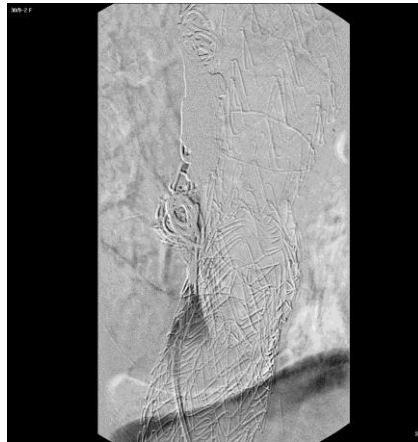


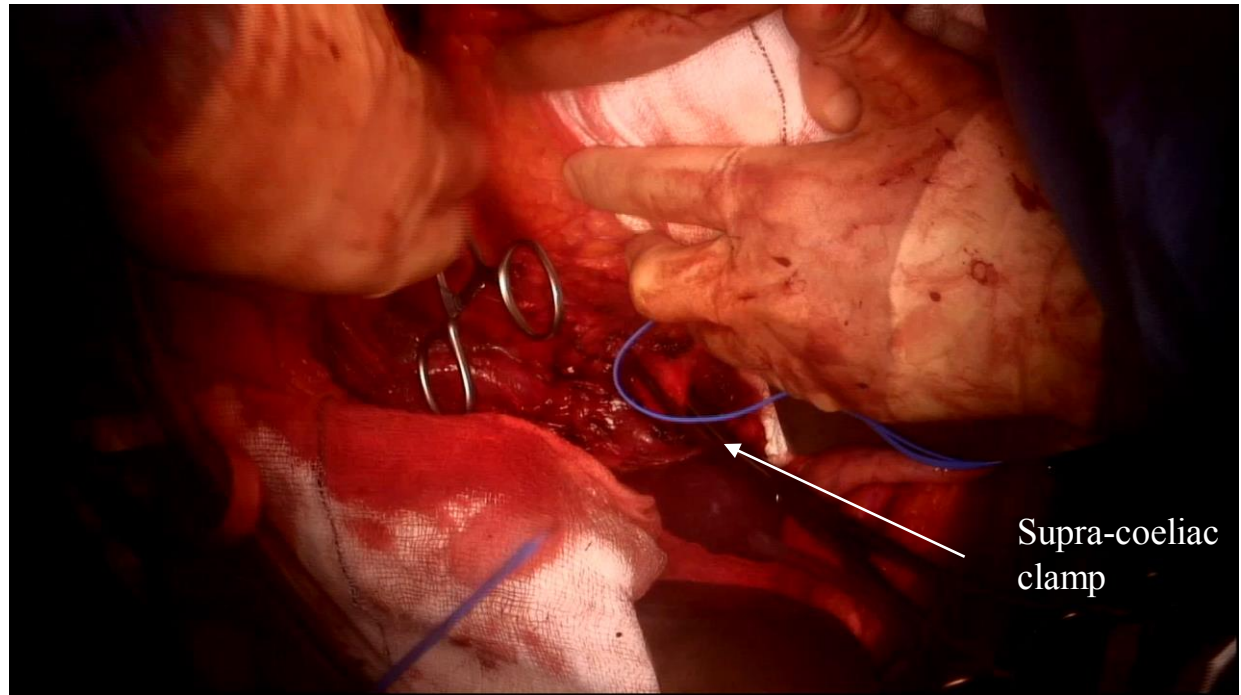
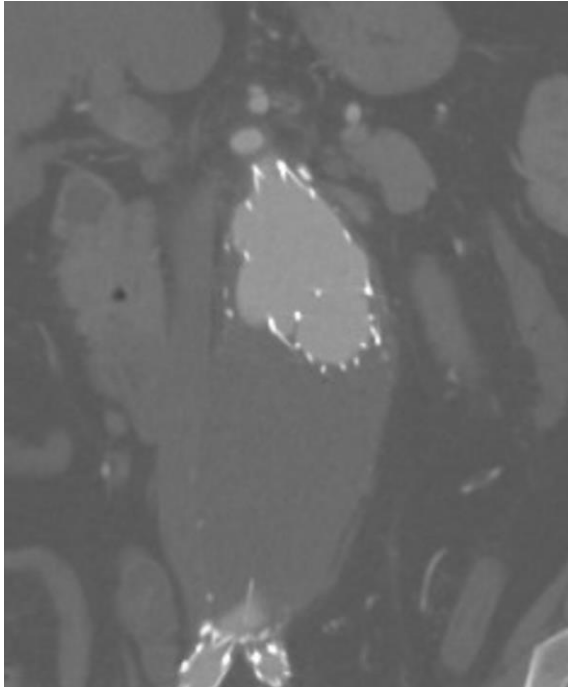
Aorta dilated beyond endograft

Extension of Short Proximal Neck



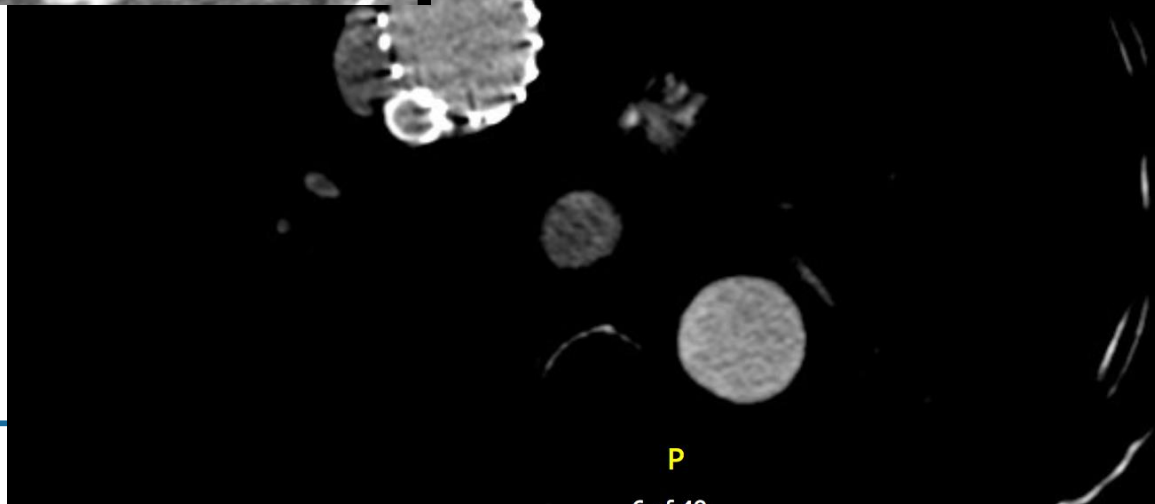
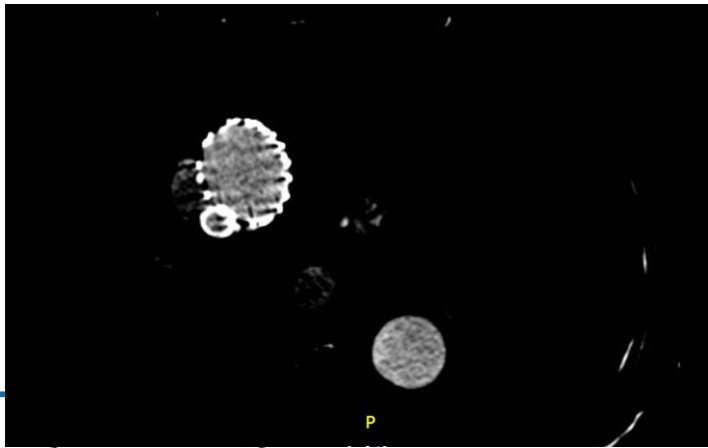
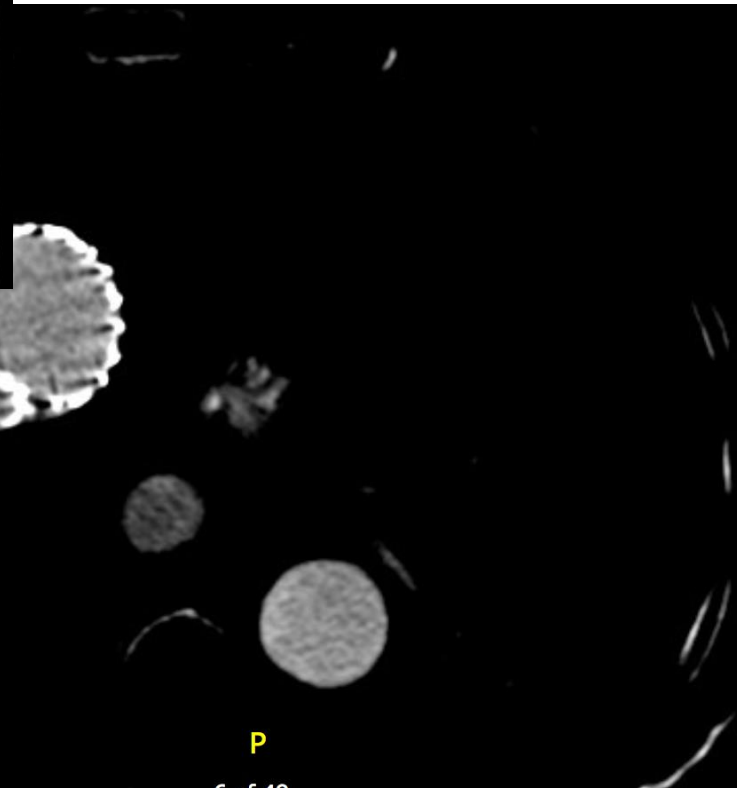
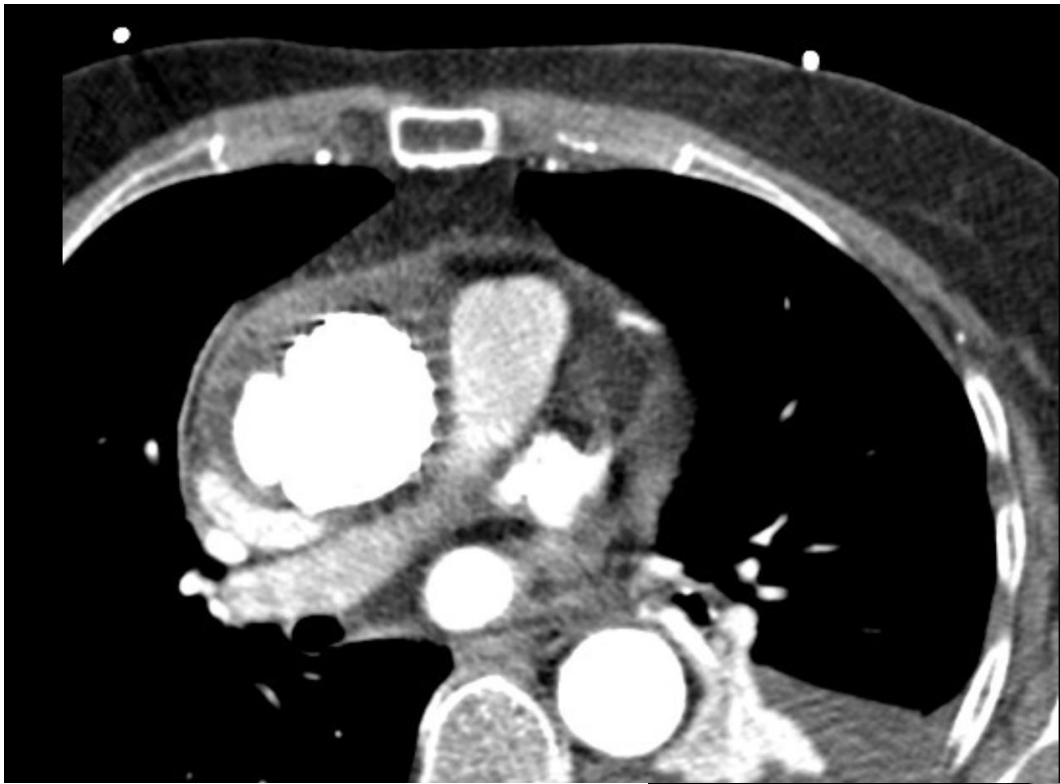
Embolization with Onyx & coils





Stent graft excision; medial visceral rotation





Summary

- Type 1 endoleak
 - occurs in 5-10% patients either primarily or during FU
 - Strongly associated with adverse outcome
- Traditional techniques remain important
 - Ballooning/high strength stents/extension cuffs
- Newer techniques have emerging body evidence
 - Anchors may be better used at time of detection
- Explant still sometimes required; high risk