

Pre-emptive Coil Embolization of IMA/Lumbar artery During EVAR Procedure

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Disclosure

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- | | |
|--|------|
| ① Consultation fees: | none |
| ② stock ownership/profit: | none |
| ③ patent fees: | none |
| ④ remuneration for lecture: | none |
| ⑤ manuscript fees: | none |
| ⑥ trust research/joint research funds: | none |
| ⑦ scholarship fund | none |
| ⑧ Affiliation with Endowed Department: | none |
| ⑨ Other remuneration such as gifts: | none |

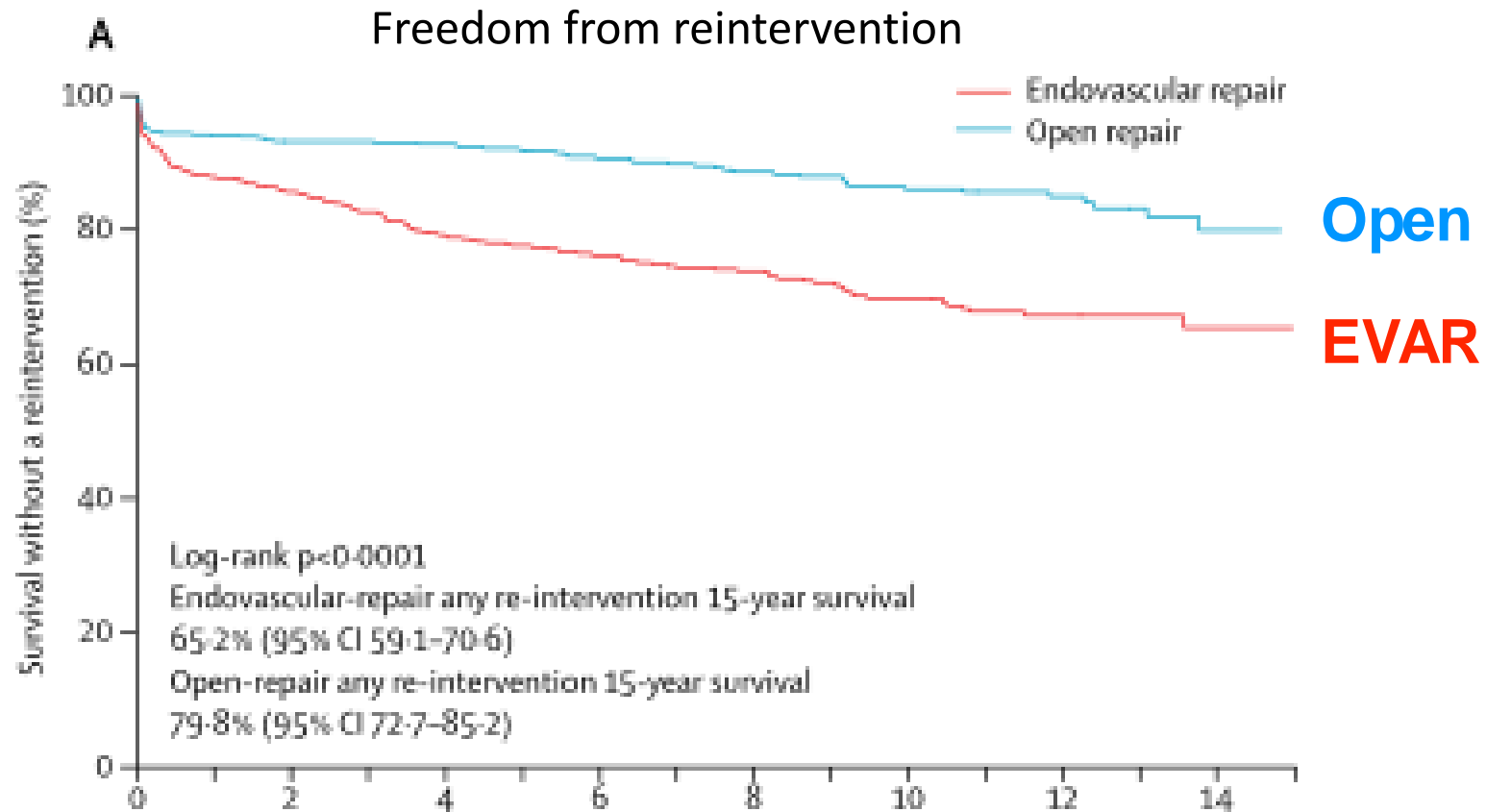
Endovascular versus open repair of abdominal aortic aneurysm in 15-years' follow-up of the UK endovascular aneurysm repair trial 1 (EVAR trial 1): a randomised controlled trial

EVAR1 trial :Lancet 2016; 388: 2366–74

1999-2004
1252 patients
AAA>55mm

Rajesh Patel, Michael J Sweeting, Janet T Powell, Roger M Greenhalgh, for the EVAR trial investigators*

OSR vs EVAR

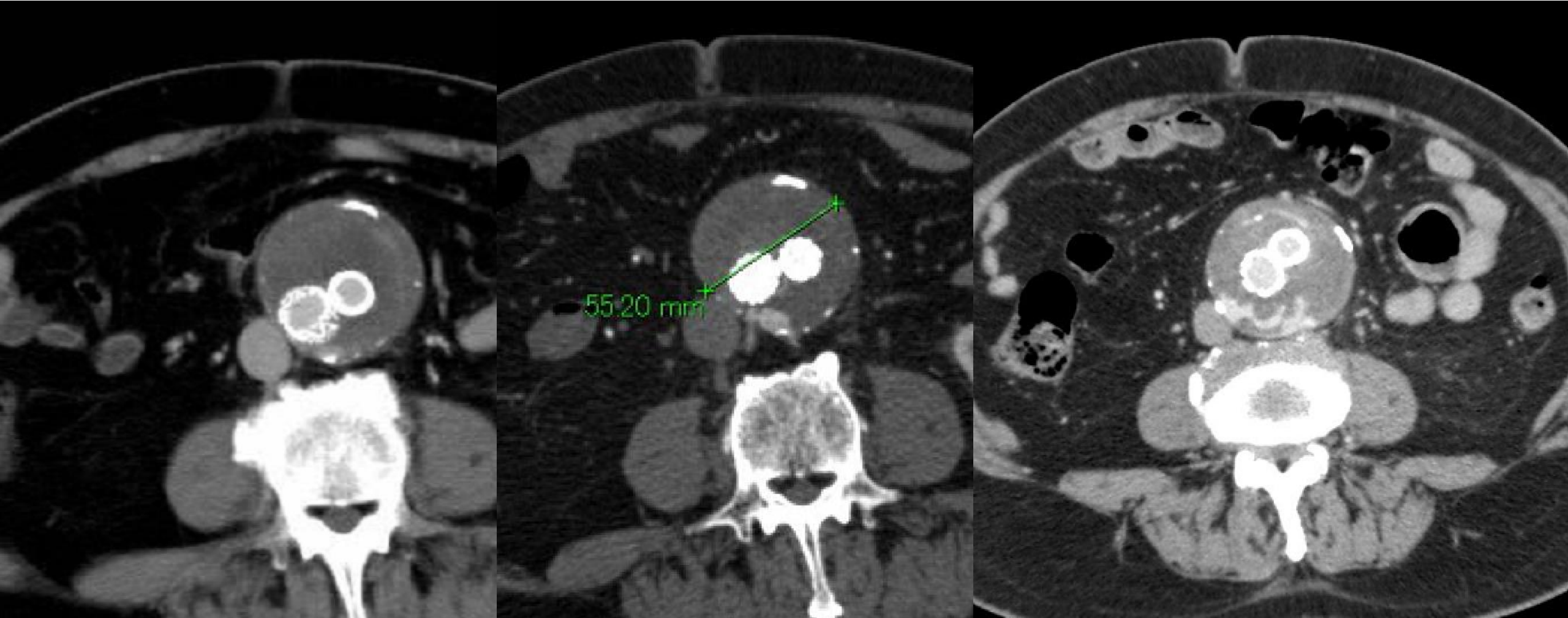


Number at risk		0	2	4	6	8	10	12	14
Endovascular repair	626	469	381	323	264	192	90	28	
Open repair	626	506	436	357	282	214	112	35	



Persistent Type II endoleak Case : 81y.o. male AF IHD HTN HLP

AAA pre 57mm → 6month 55mm → 4y 60mm

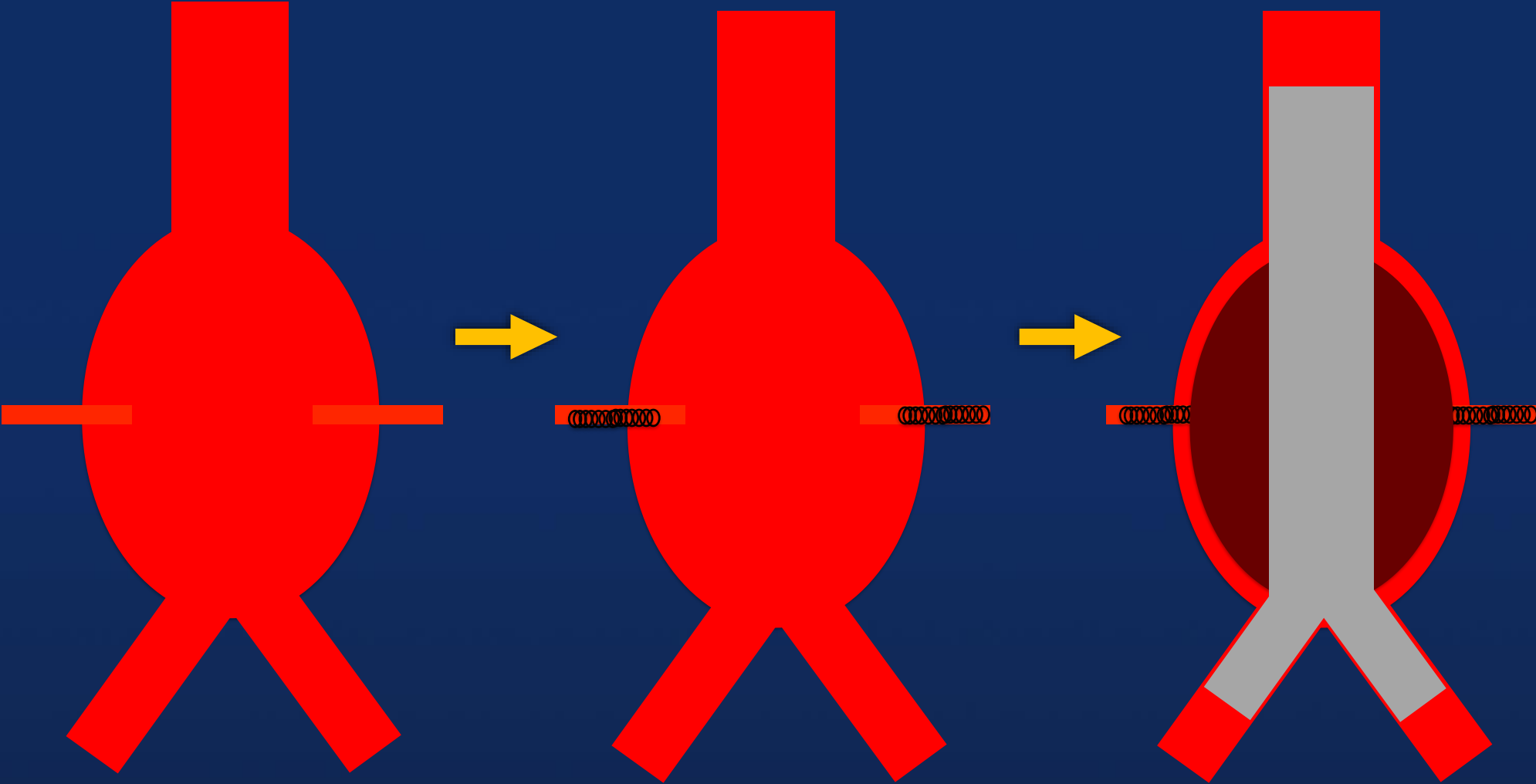


Persistent type II EL : cause of malignant cycle after EVAR

- Persistent type II EL was associated with high incidence of adverse event and additional procedure.
- Coil embolization after EVAR could not control all sac enlargement cases with type II endoleak.

We should perform EVAR without persistent type II EL!

Pre-emptive Coil embolization to avoid Type II EL before EVAR



Endovascular Aneurysm Repair With Inferior Mesenteric Artery Embolization for Preventing Type II Endoleak: A Prospective Randomized Controlled Trial

Samura M, Morikage N, Mizoguchi T, et al. *Ann Vasc Dis* 2018; **11**: 259–264.

Table Clinical outcomes in the intention-to-treat analysis of endovascular aneurysm repair with inferior mesenteric artery embolization for preventing type II endoleak in randomized control trial (quote from the reference 24)

Variables	Embolization (n=53)	Nonembolization (n=53)	<i>P</i>	ARR (95% CI)	NNT (95% CI)
Follow-up periods, mo	22.5±11.5	22.4±11.6	0.95		
Presence of T2EL	13 (24.5%)	26 (49.1%)	0.009	24.5 (6.2–40.5)	4.1 (2.5–16.1)
Source of T2EL (% in T2EL presence)					
IMA	0	3 (11.5%)			
LAs	13 (100%)	13 (50.0%)			
IMA+LAs	0	7 (26.9%)			
Others (MSA, LAs+MSA or ARA)	0	3 (11.5%)			
Aneurysmal diameter change, mm	−5.7±7.3	−2.8±6.6	0.037		
Aneurysmal growth ≥2 mm related to T2EL	2 (3.8%)	9 (17.0%)	0.030	13.2 (1.6–18.6)	7.6 (5.4–61.4)
Source of T2EL (% in related to T2EL)					
IMA, IMA+LAs	0	8 (88.9%)			
Others	2 (100%)	1 (11.1%)			
Secondary intervention	1 (1.9%)	1 (1.9%)	1.00		
Related to T2EL	0	0			

ARA indicates accessory renal artery; ARR, absolute risk reduction; CI, confidence interval; IMA, inferior mesenteric artery; LA, lumbar artery; MSA, medial sacral artery; NNT, number needed to treat; T2EL, type II endoleak.

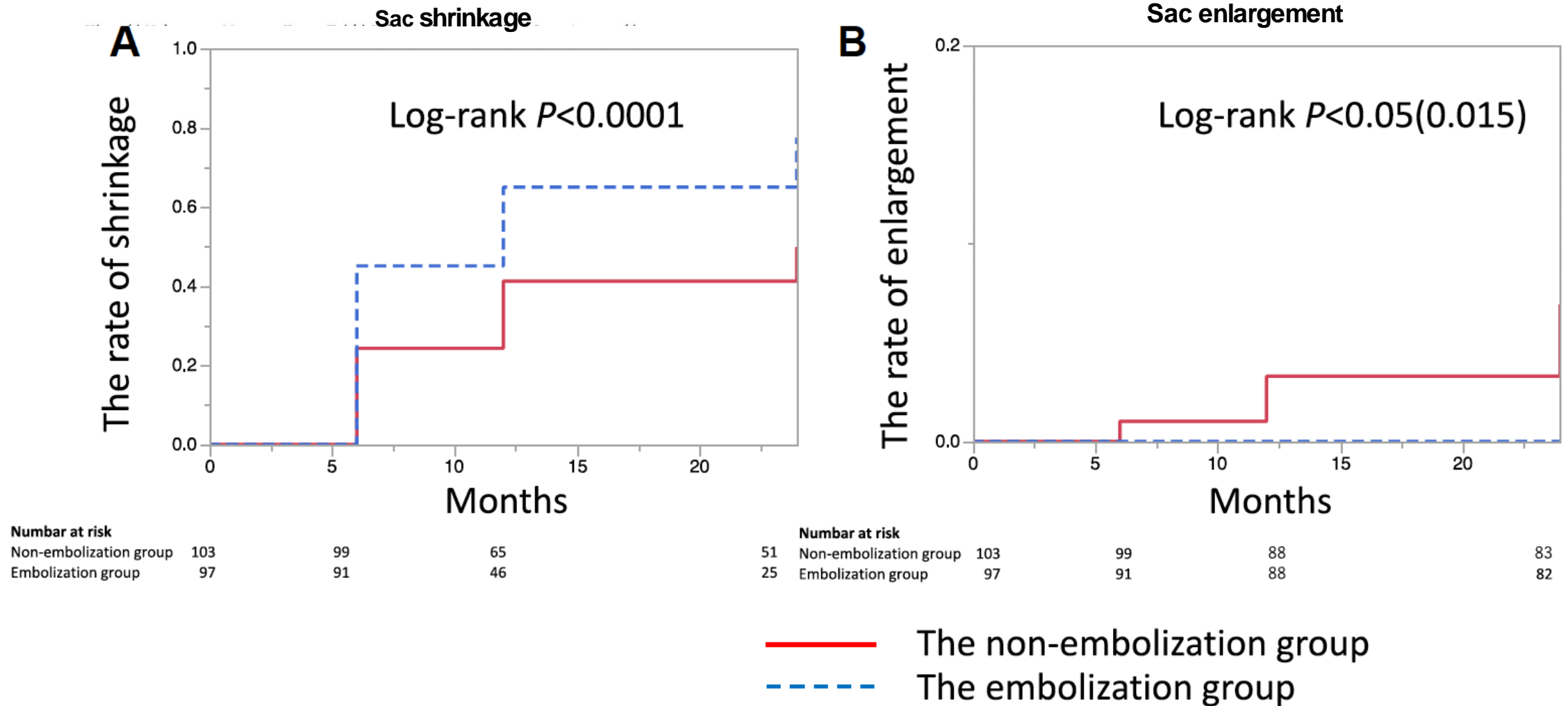


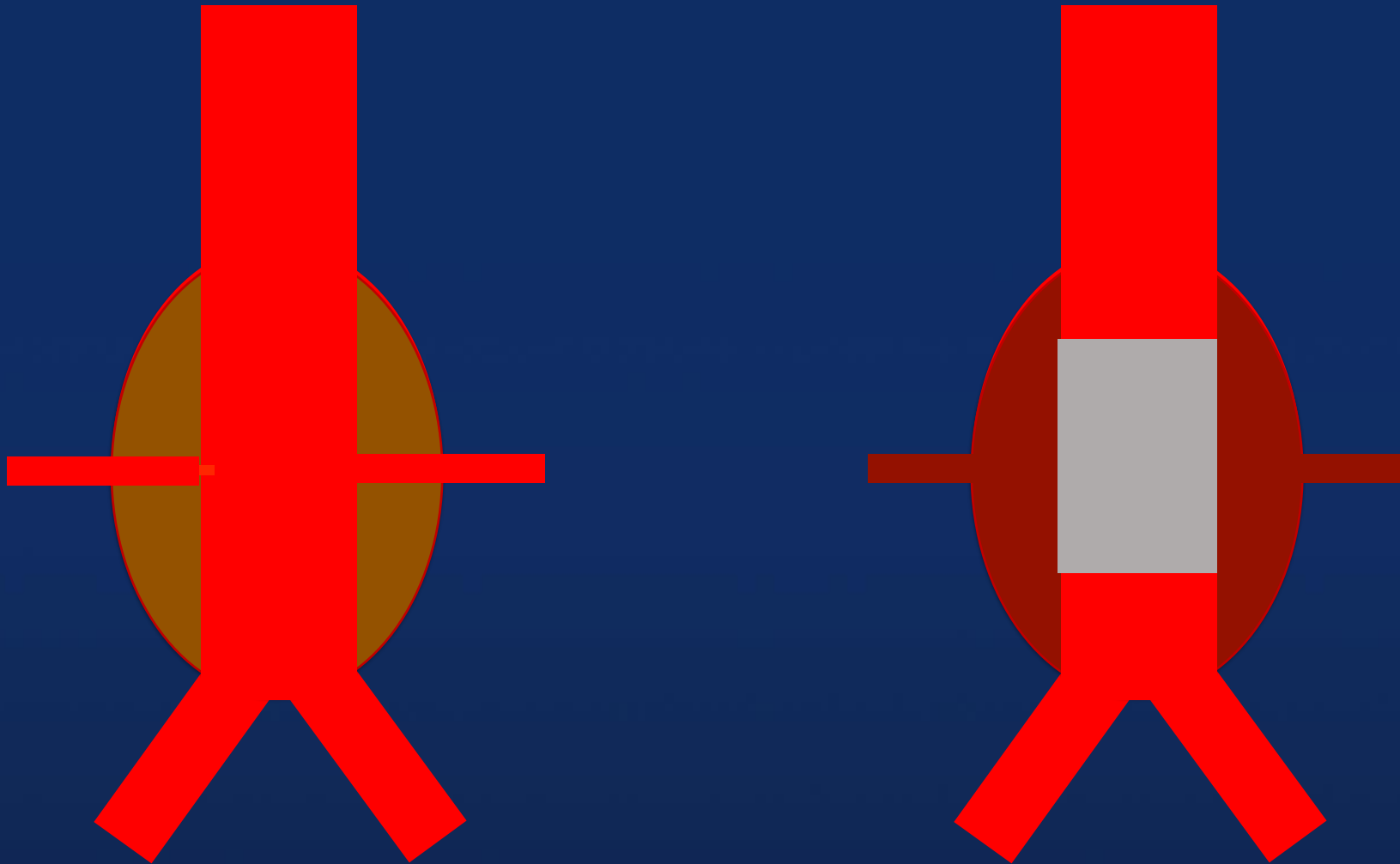
Fig. 3. Kaplan-Meier curves of aneurysm sac shrinkage (A) and aneurysm sac enlargement (B) up to 2 years after EVAR.

Pre-emptive Coil embolization

- Target
 - IIA: internal iliac A
 - IMA: inferior mesenteric A
 - lumbar A
 - Median sacral A
- Embolic material
 - Coil (pushable, Detachable)
 - Vascular plug
 - Stentgraft



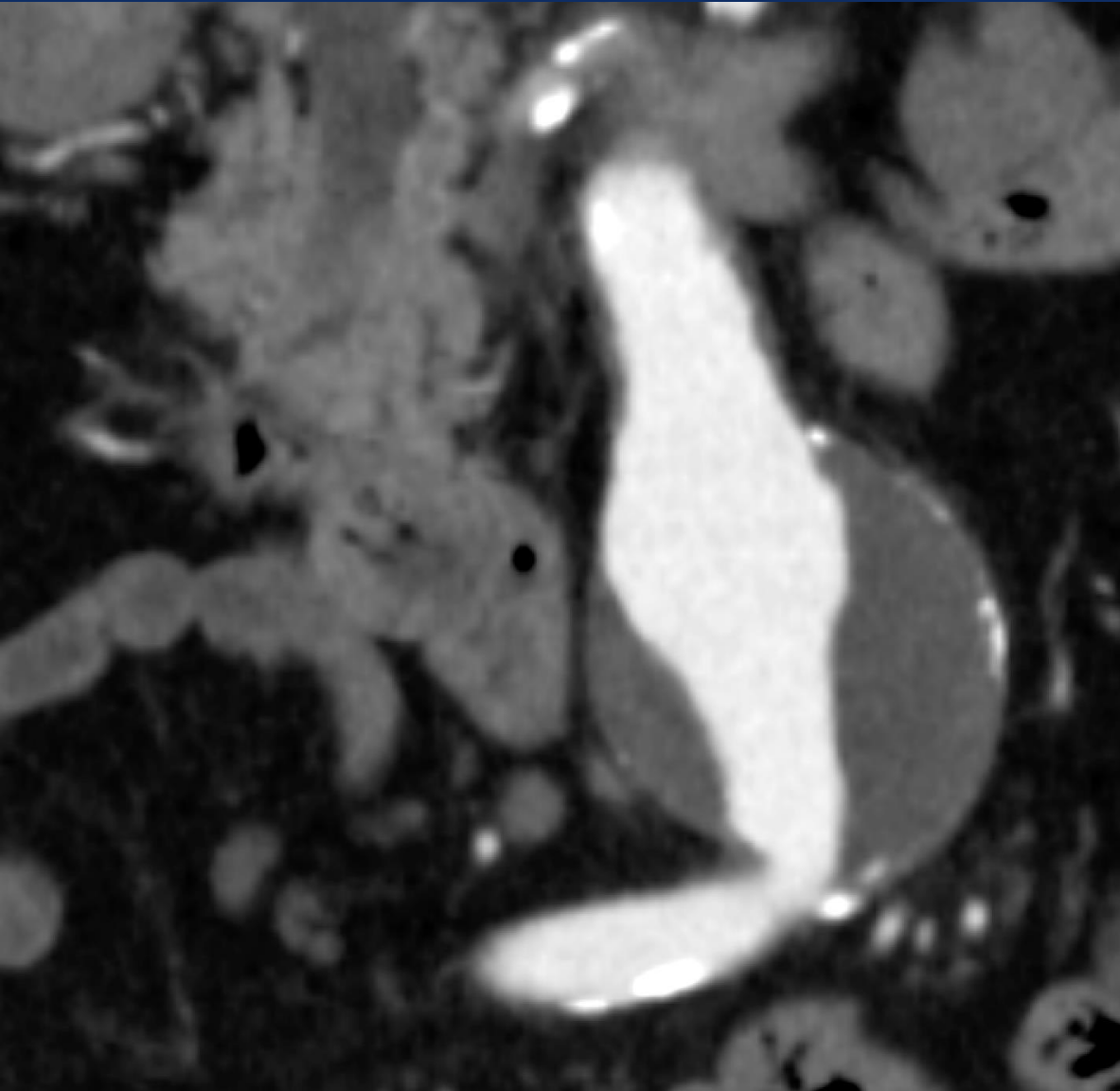
Pre-emptive embolization with Aorta extension



Aorta extension implantation

80's y.o. female

IMA embolization with 36mm aortic cuff Before EVAR

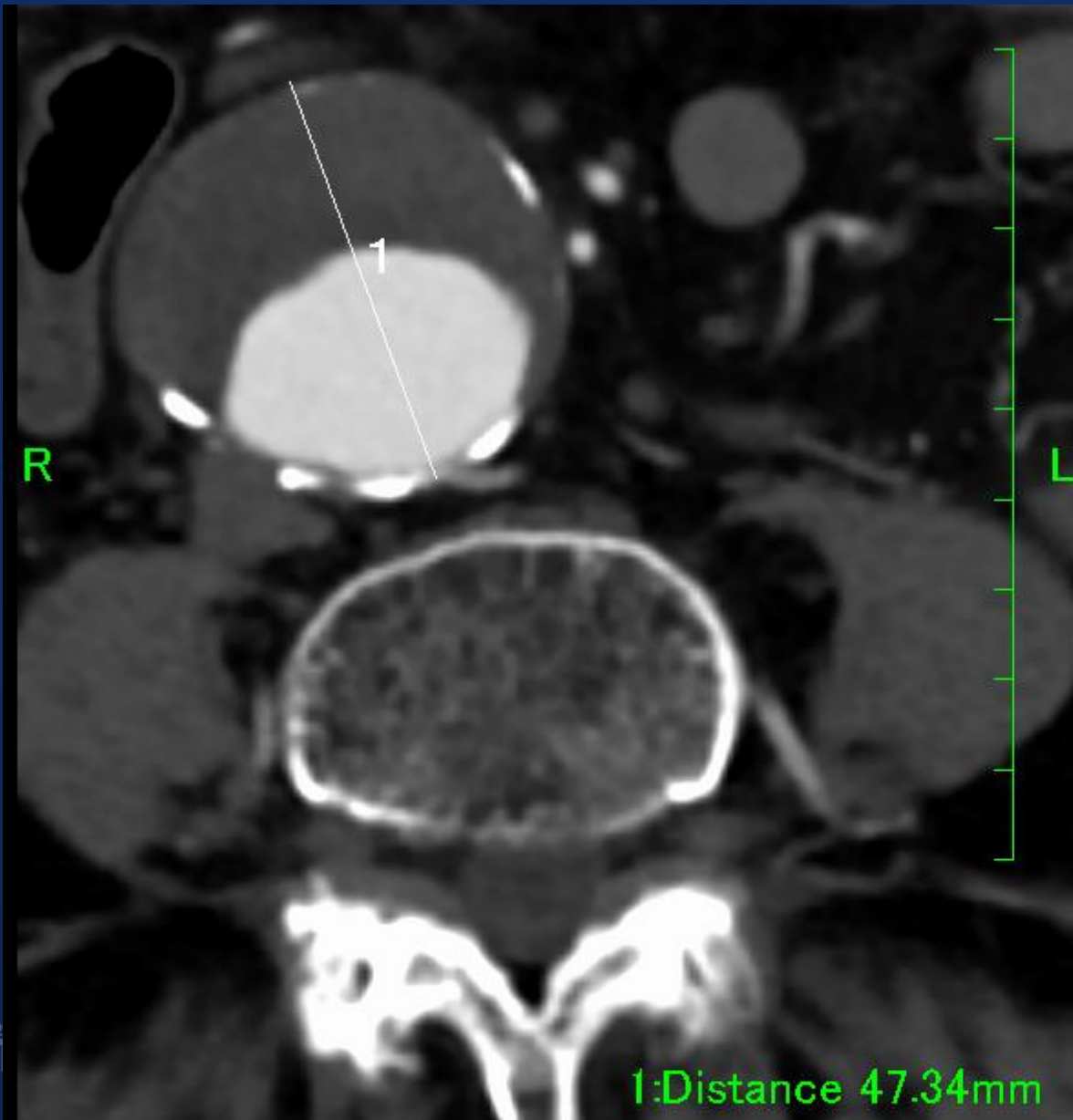


IMA & L3 lumbar embolization with 36mm aortic cuff Before EVAR

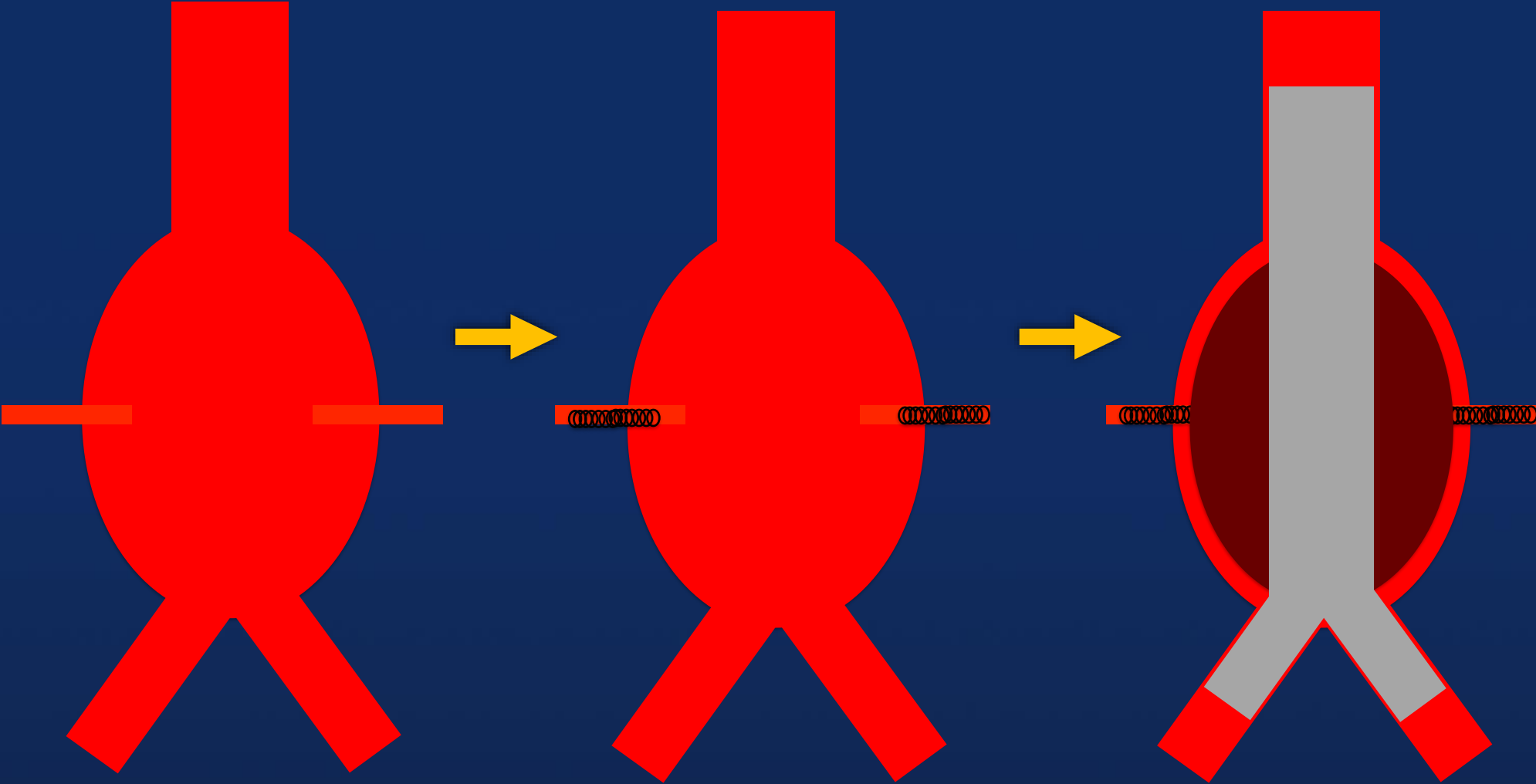


IMA embolization with 36mm aortic cuff Before EVAR

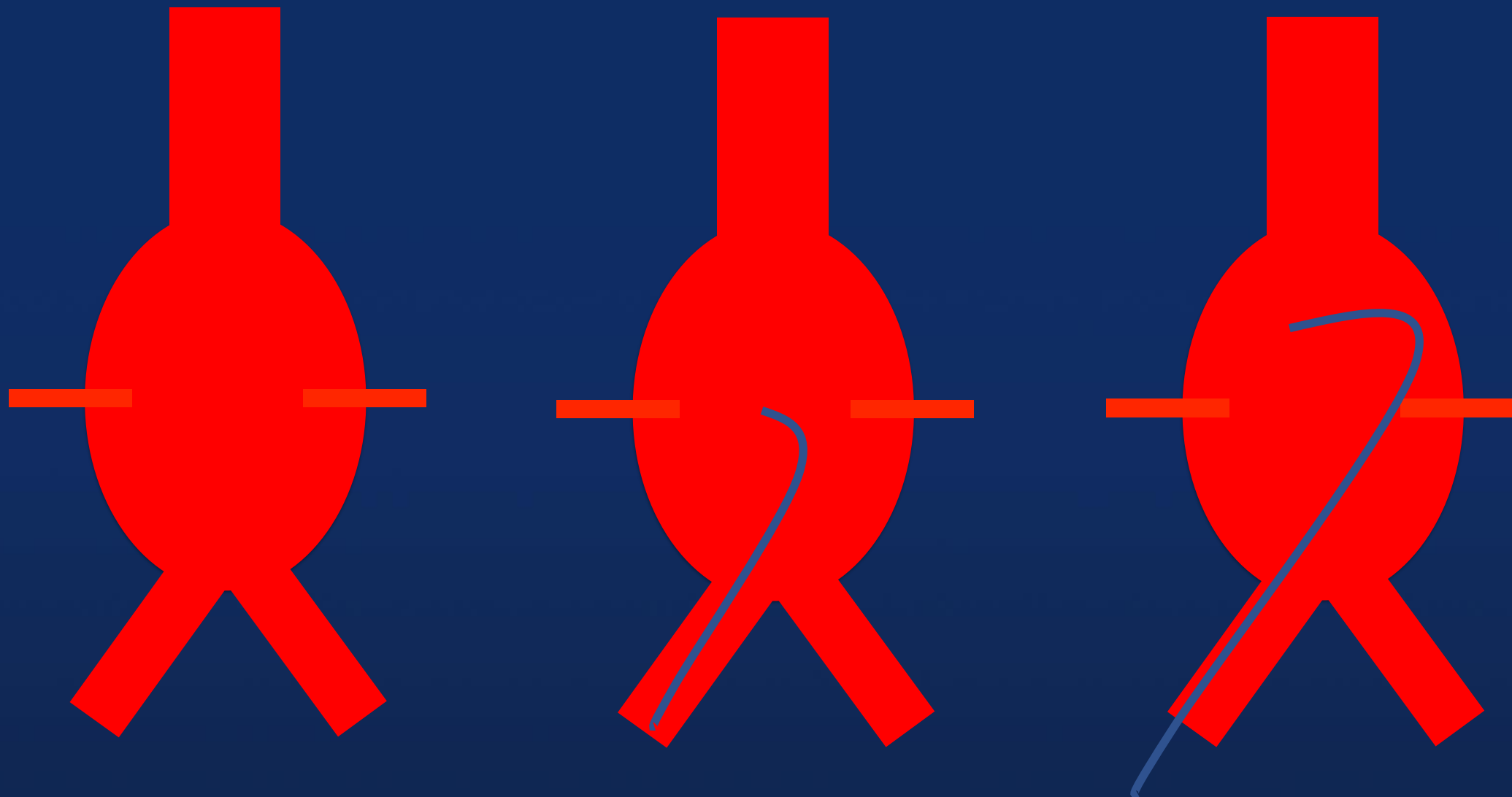
6 month after EVAR



Pre-emptive Coil embolization to avoid Type II EL before EVAR

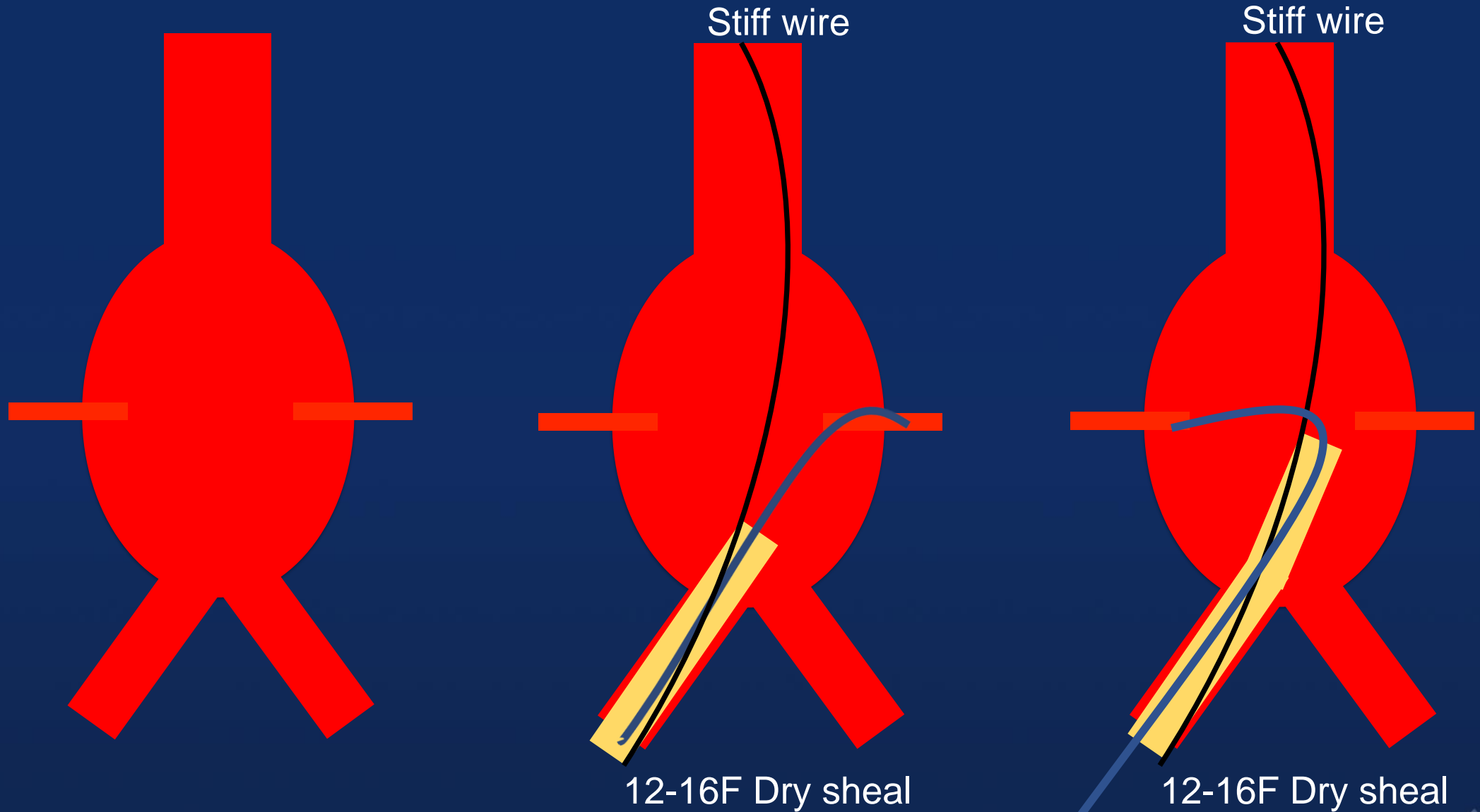


Sheath support technique for pre-emptive coil embolization

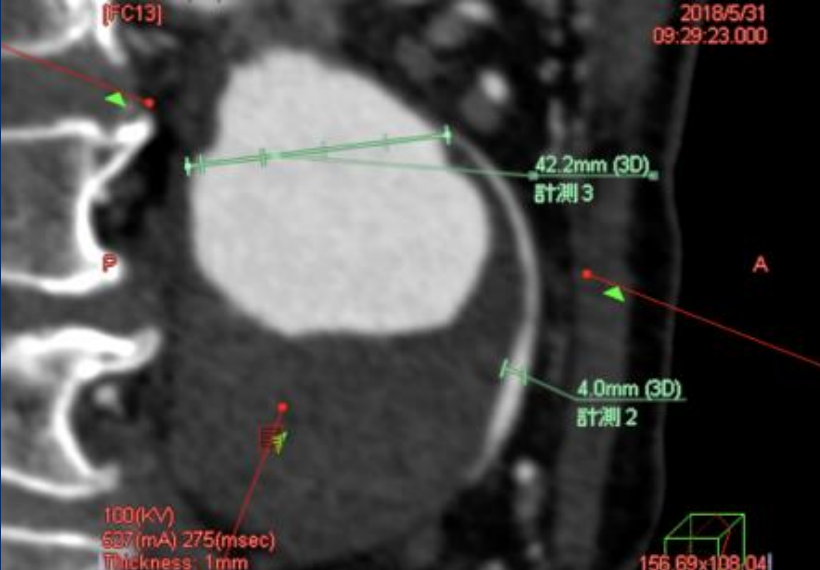


Difficult to manipulate catheter

Sheath support technique for pre-emptive coil embolization



Pre-emptive embolization for IMA



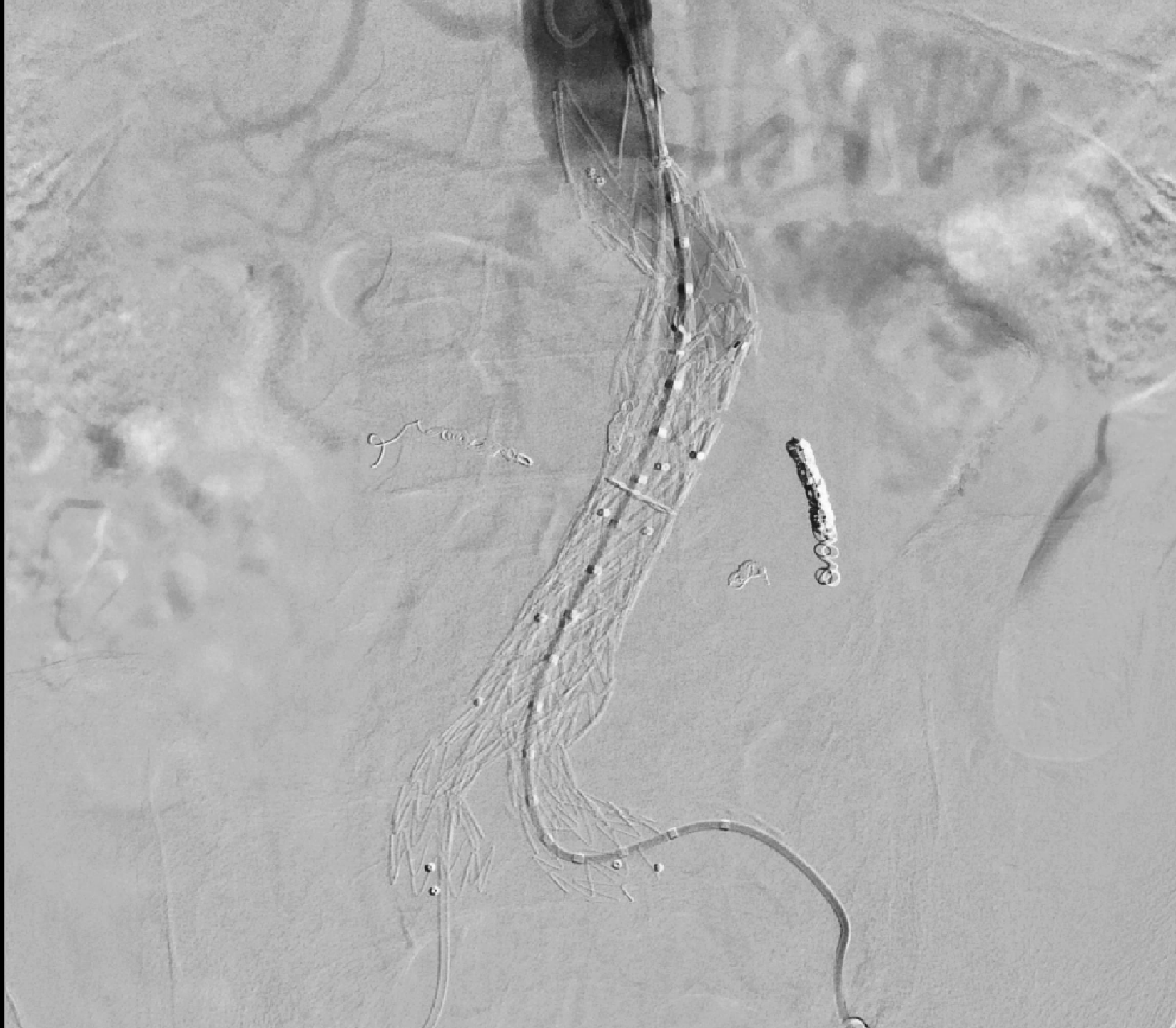
80's y.o male

IMA embolization

Interlock 5/15, 4/15, 3/12

Cobra + Microcatheter

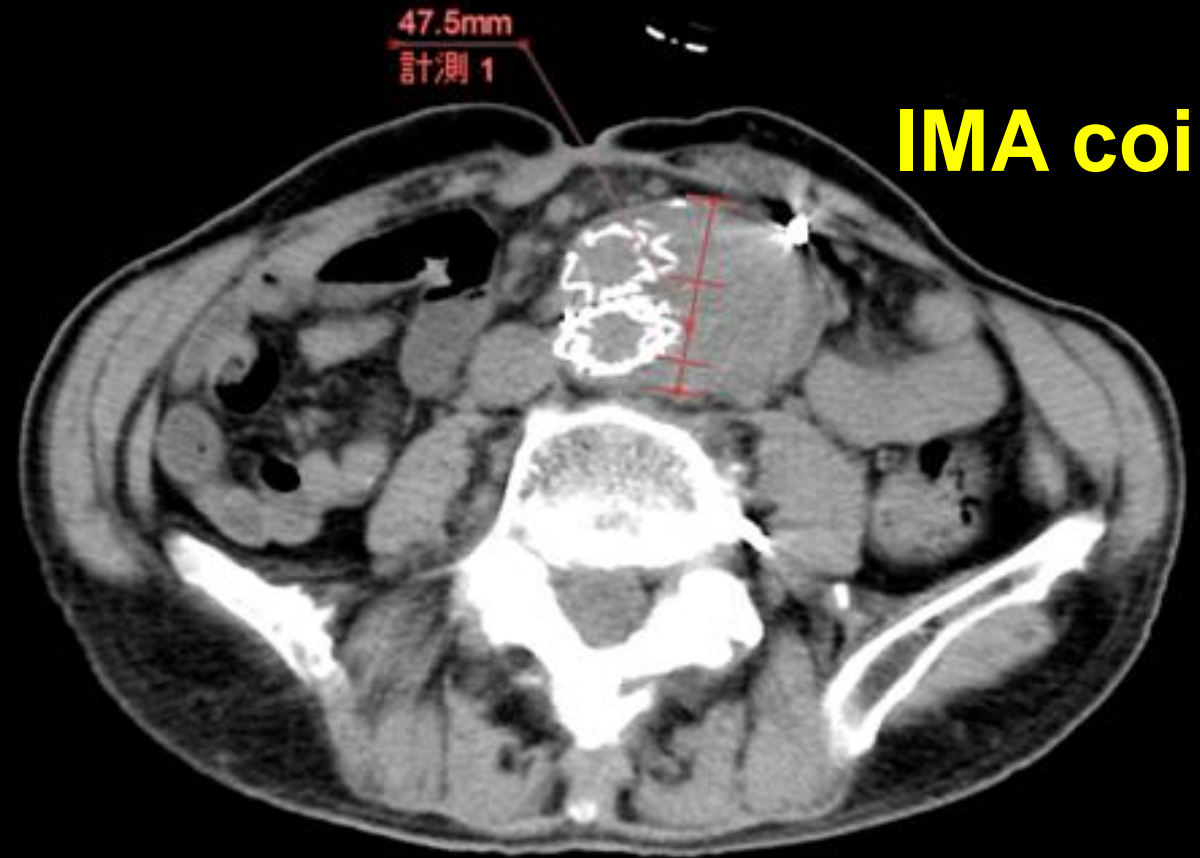
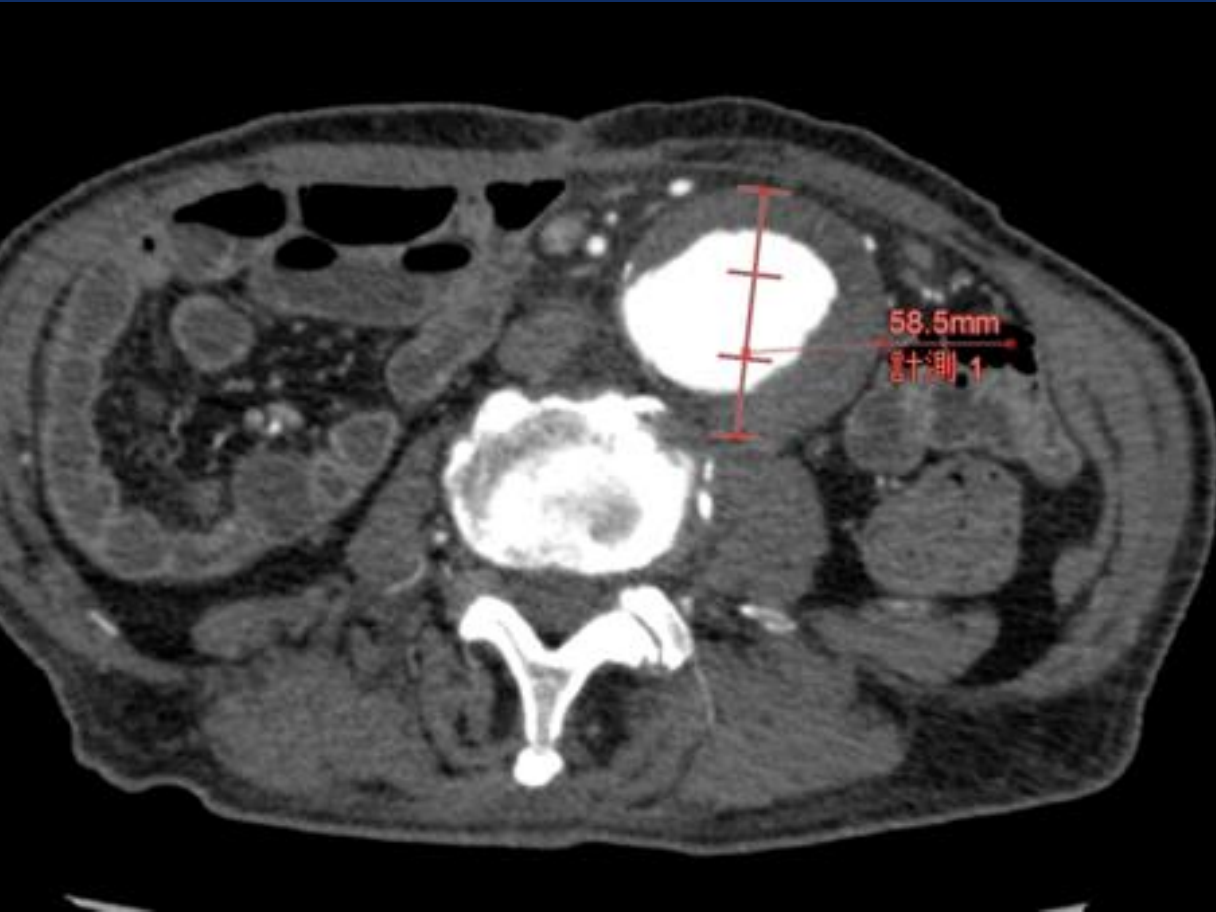
18F Dry seal



Sac decreased 6 month after EVAR

Before EVAR
58mm

6month after EVAR
47mm

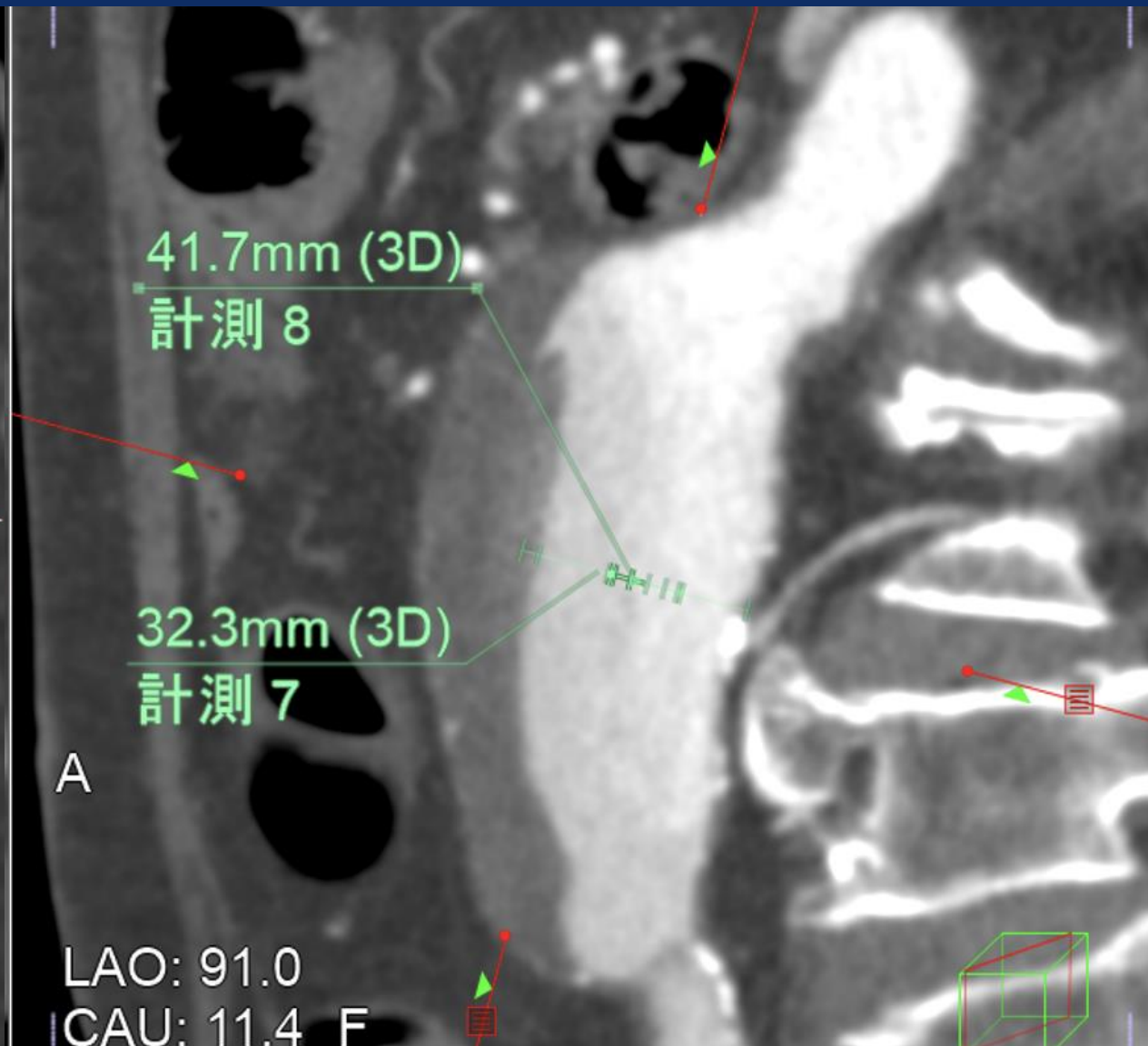
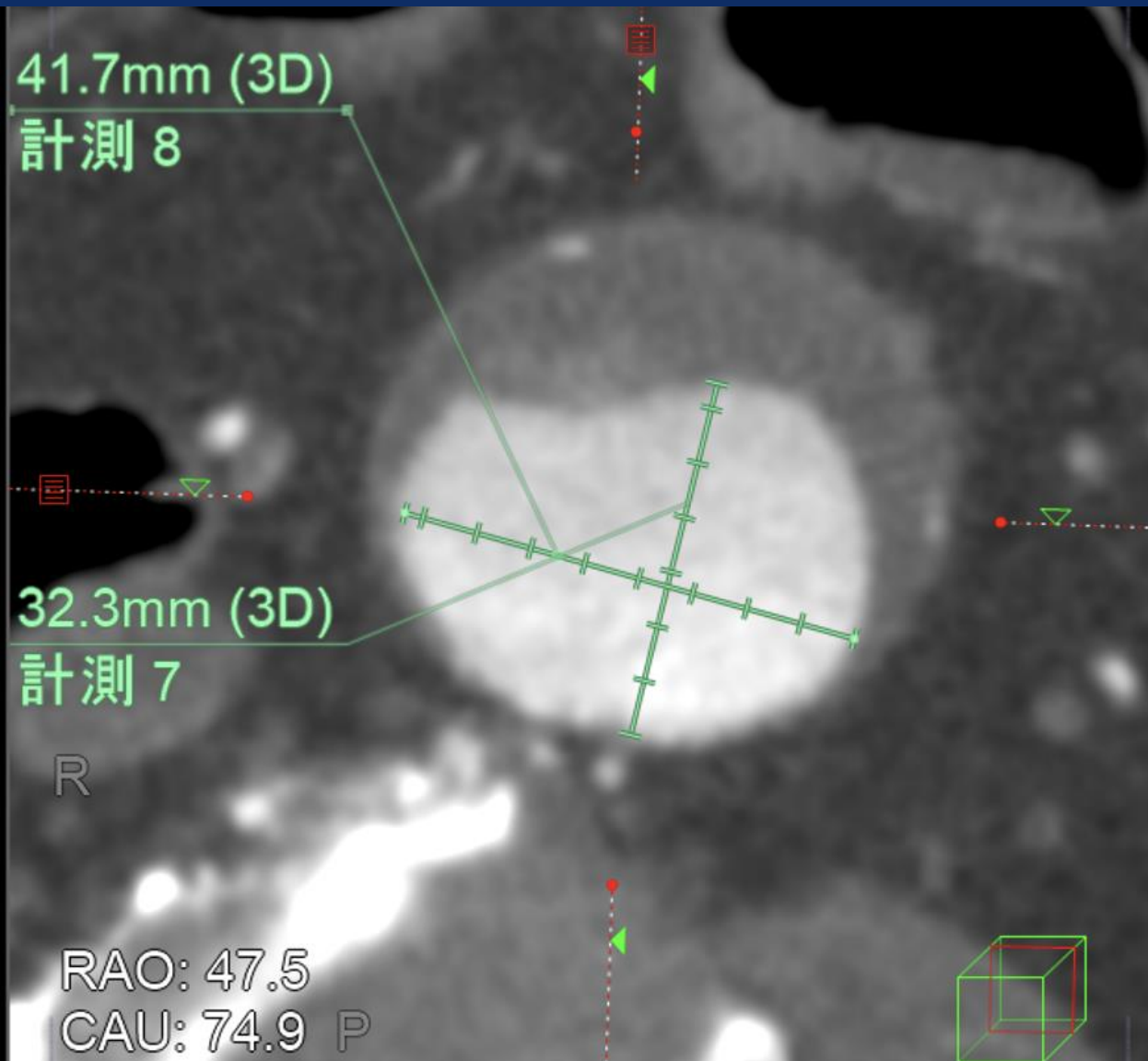


Pre-emptive embolization for Lumbar

83's y.o. male

AAA AF HTN DM

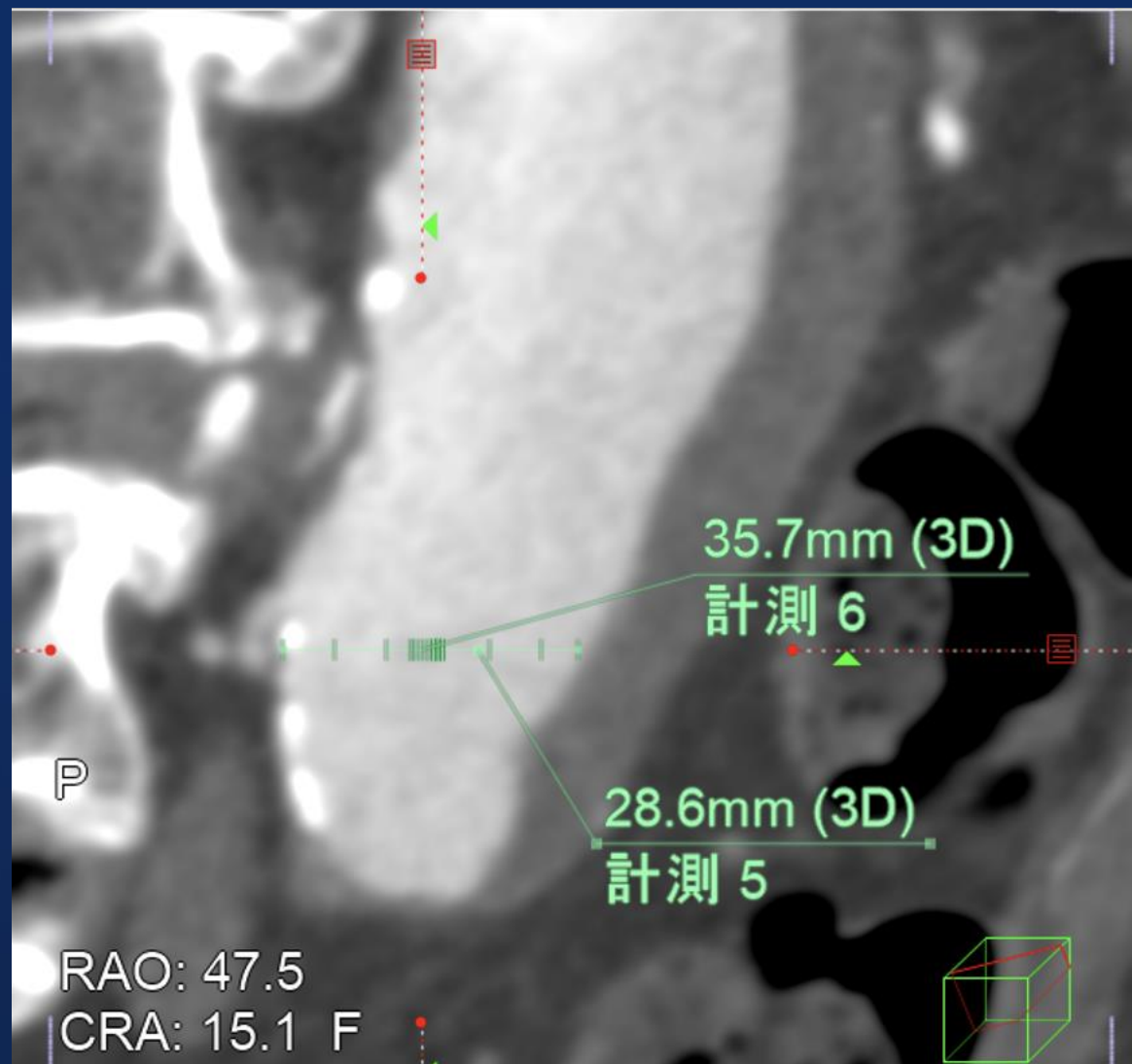
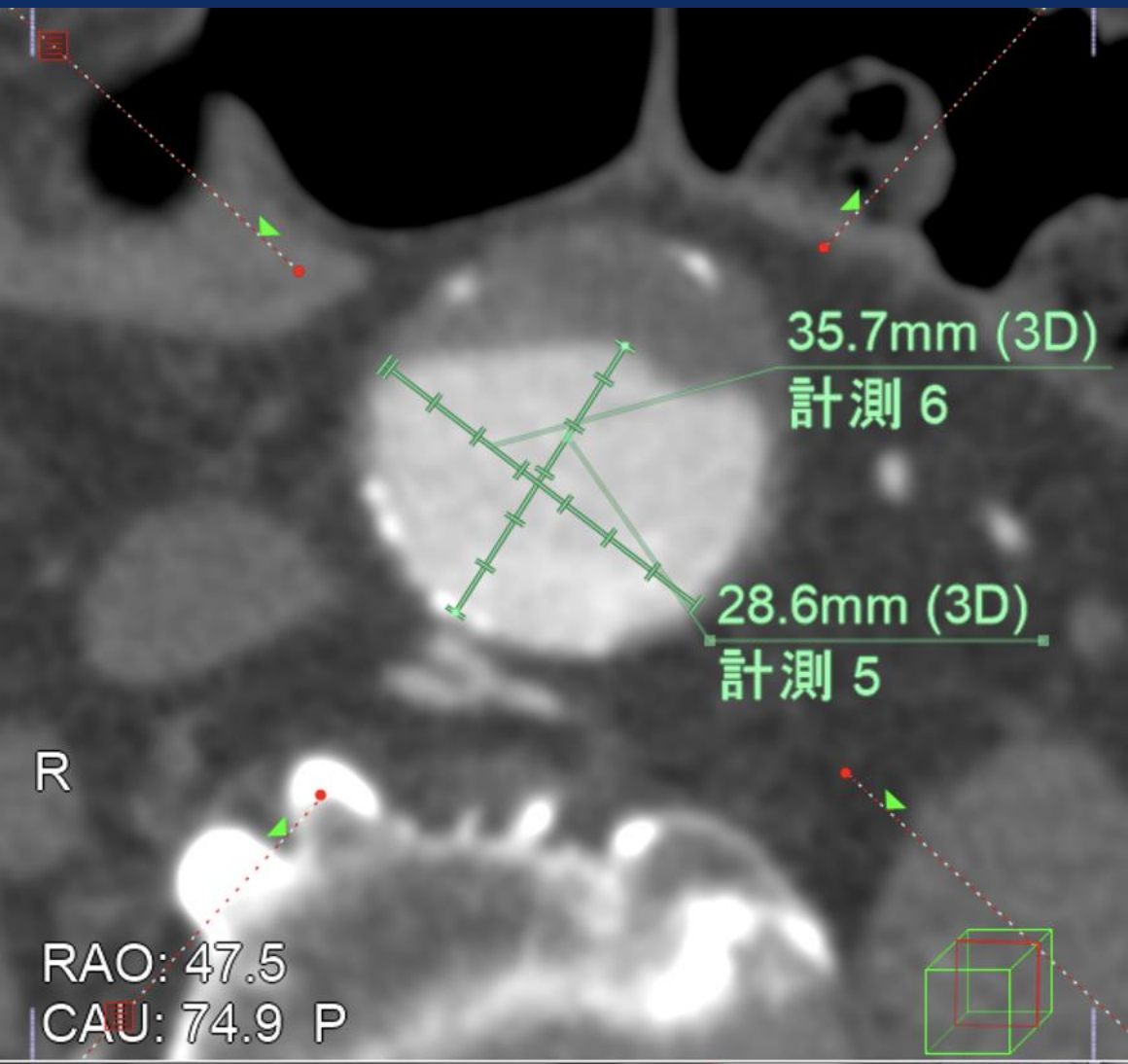
L3 Lumbar embolization with EMBOLD



83's y.o. male

AAA AF HTN DM

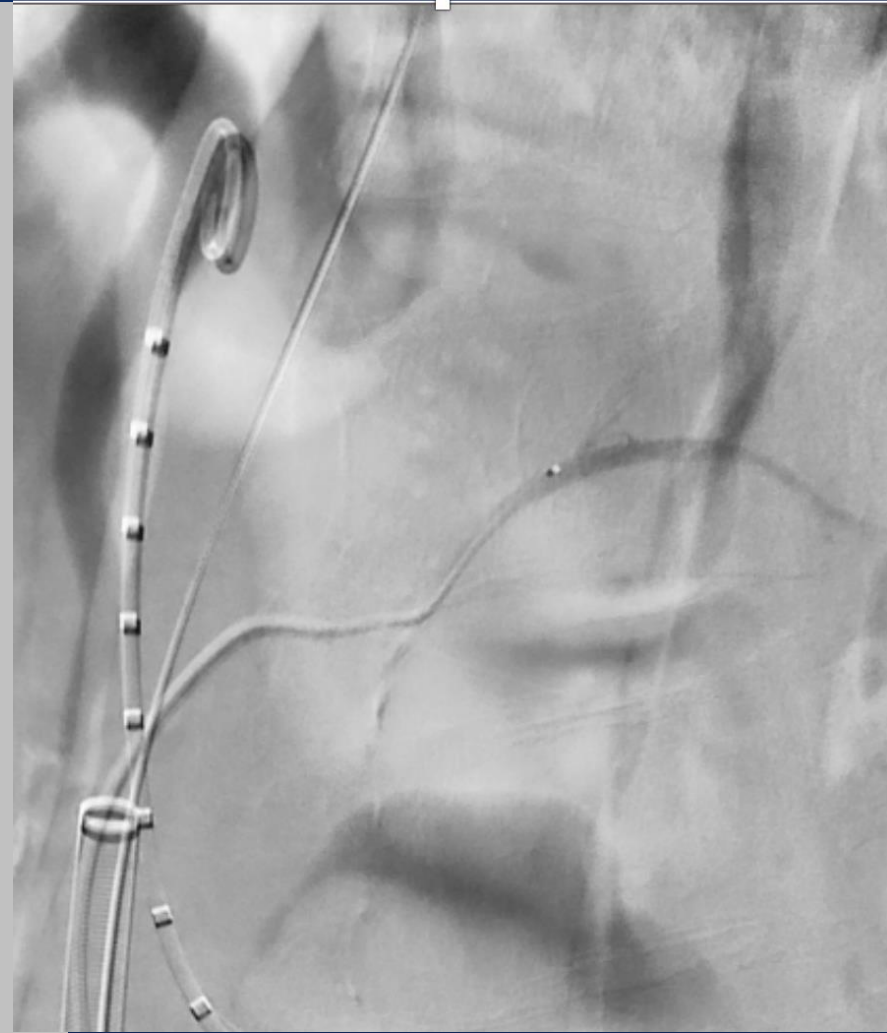
L4 Lumbar embolization with EMBOLD



83's y.o. male

AAA AF HTN DM

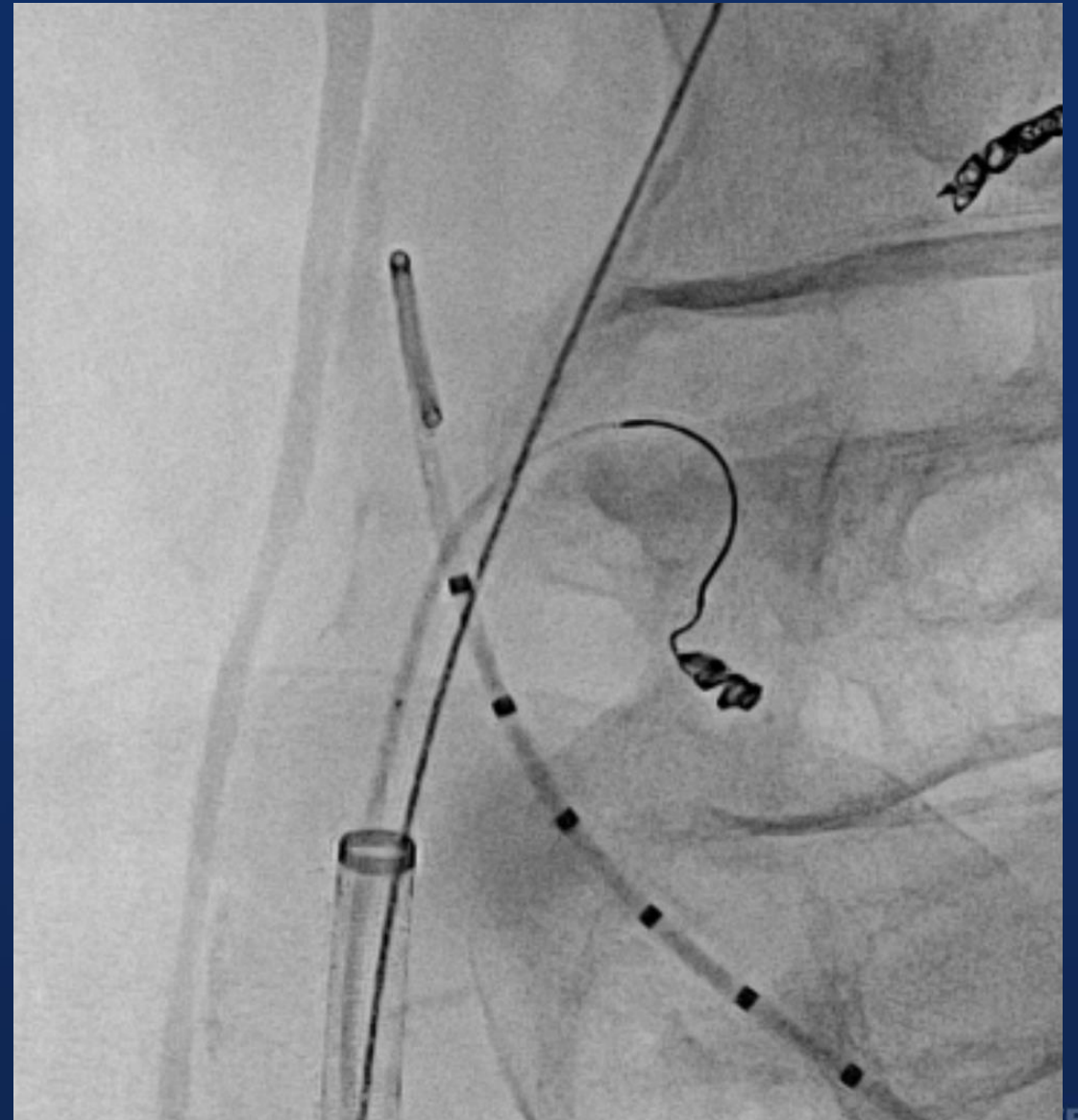
L3 Lumbar embolization with EMBOLD



83's y.o. male

AAA AF HTN DM

L4 Lumbar embolization with EMBOLD



Excluder conformable
28-14.5-120

Rt:16-20-135

Lt:16-20-135

L3 Lt lumbar coil

L4 lumbar coil

Failure

Rt L3 lumbar

Procedure time 166min
contrast 120ml

KUHP pre-emptive coil cases

2013/Jan-2019/Sep

AAA patients planned to perform EVAR

Baseline characteristics

	overall (n=127)	Simple EVAR (n=79)	Pre-emptive coil (n=48)	P
Age	78.0±7.6	77.9±0.9	78.0±1.1	0.50
Male	110 (87%)	76 (85%)	43 (90%)	0.44
Aneurysm Diameter(mm)	51.9±7.1	51.4±7.1	52.7±7.0	0.85

Baseline CT analysis

	overall (n=127)	Simple EVAR (n=79)	Pre-emptive coil (n=48)	P
IMA patency	89 (71%)	50 (64%)	39(81%)	0.04
IMA diameter (mm)	2.1±1.6	2.0±1.7	2.4±1.4	0.13
Lumbar A patency	118(94%)	70 (89%)	48 (100%)	0.01
Lumbar A diameter (mm)	2.3±0.8	2.2±0.9	2.4±0.6	0.09
Number of patent Lumbar A	3.5±1.8	3.2±1.9	4.1±1.5	0.004

KUHP EVAR In-hospital outcome

	overall (n=127)	Simple EVAR (n=79)	Pre-emptive coil (n=48)	P
Skin-to skin Procedure time(min)	160 (120-197)	120 (120-206)	150 (125-180)	0.21
Contrast volume(ml)	80 (65-110)	83 (65-120)	80 (63-100)	0.05

+30min

KUHP EVAR In-hospital outcome

	overall (n=127)	Simple EVAR (n=79)	Pre-emptive coil (n=48)	P
Diameter Change (mm)	-4 (2-8)	-3 (-1- -7)	-5 (-3 - -10)	0.14
Diameter dilatation>2mm	6 (5%)	5 (6.3%)	1 (2.1%)	0.41
Diameter Shrinkage>5mm	57 (45%)	31 (39%)	26 (54%)	0.10

Conclusion

- EVAR has been required long term durability as well as open surgical repair addition to the minimally invasiveness.
- Persistent type II endoleak associated with adverse event including aneurysm sac enlargement and additional procedure.
- Pre-emptive embolization of IMA/Lumbar artery might associate with long term durability of EVAR.