Mid-Term Outcomes of Flared Iliac Limb Used for Combined Common Iliac Artery Aneurysm during EVARs

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Conflicts of Interests

No Disclosure

Introduction

- Common iliac artery (CIA) aneurysms have been reported to be combined in 15% to 40% of patients with abdominal aortic aneurysms (AAAs)
- Ectatic CIA can be treated with flared iliac limbs but a dilated artery used as a sealing zone could increase the risk of a late type 1b endoleak (EL) by 4.5-folds
- Additional iliac artery growth after EVAR could be associated with increased secondary interventions and/or late aneurysm rupture

- *Armon MP, et al. Common iliac artery aneurysms in patients with abdominal aortic aneurysms. Eur J Vasc Endovasc Surg 1998;15:255-7.*
- *Gray D, et al. EVAR with Flared iliac limbs has a high risk of late type 1b endoleak. Eur J Vasc Endovasc Surg 2017;54:170-6*
- *Ballotta E, et al. Natural history of common iliac arteries after aorto-aortic graft insertion during elective open abdominal aortic aneurysm repair: a prospective study. Surgery 2008;144:822-6*

Purpose

- To determine the outcomes of flared iliac limb used for combined common iliac artery aneurysm (CIAA) during endovascular aneurysm repair (EVAR) for AAA

Methods

- From January 2005 to September 2017
- The single center, retrospective study

- Total 444 cases of EVAR

  - Inclusion : 184 CIAAs in 149 patients

  - Group1: Flared iliac limb (≥ 24mm)
    - ✓ 77 limbs in 67 patients

  - Group2: Hypogastric artery embolization with iliac limb extension
    - ✓ 107 limbs in 98 patients

  - Exclusion
    - ✓ Ruptured AAA, isolated iliac artery aneurysm

Methods

- Early 30-day outcomes
  - ✓ Perioperative Type Ib / III
  - ✓ Adjuvant or reintervention
  - ✓ Limb occlusion/stenosis >50%
  - ✓ Mortality and morbidity
- Late outcomes
  - Late Type Ib / III
  - Re-intervention
  - Limb patency
  - Survival

Characteristics

	Flared limb (n=67)	IIE + EE (n=98)	Total (n=165)	P-value
Median age (years, IQR)	72 (68-77)	71 (66-77)	71.5 (67-77)	0.492[a]
AAA (Max. size, mm, IQR)	53.2 (51.3-58)	53.2 (50.9-62)	53.2 (51-60.6)	0.397[a]
Male	70 (90.9)	98 (91.6)	168 (91.3)	0.872[b]
Indication of EVAR				0.176[b]
Asymptomatic	64 (83.1)	80 (74.8)	144 (78.3)	
Symptomatic	13 (16.9)	27 (25.2.)	40 (21.7)	
Hypertension	63 (81.3)	71 (66.4)	134 (72.8)	0.020[b]
COPD	24 (32.0)	19 (18.8)	43 (24.4)	0.044[b]
Diabetes	15 (19.5)	23 (21.5)	38 (20.7)	0.739[b]
Smoking	40 (53.3)	59 (53.5)	99 (53.8)	0.668[b]
Hyperlipidemia	48 (64.0)	46 (43.0)	94 (51.1)	0.010[b]
IHD	19 (25.3)	33 (30.8)	52 (28.3)	0.359[b]
Renal disease	2 (2.7)	3 (3.0)	5 (2.8)	1.000[c]

[a] Mann-Whitney test; [b] Chi-square test; [c] Fisher's exact test

30-day Outcomes

	Flared limb (n=77)	IIE + EE (n=107)	Total (n=184)	P-value
Type Ib or III	7 (9.1)	1 (0.9)	9 (4.9)	0.010[a]
Intraoperative Ib	7 (9.1)	0	7 (3.8)	
Limb occlusion or stenosis (>50%)	1 (1.3)	0	1 (0.5)	0.418[c]
Adjuvant or 2nd intervention	8 (10.4)	1 (0.9)	9 (4.9)	0.004[a]
Mortality	0	0	0	

[a] Fisher's exact test

Late Outcomes

Median follow up duration of 24.4months

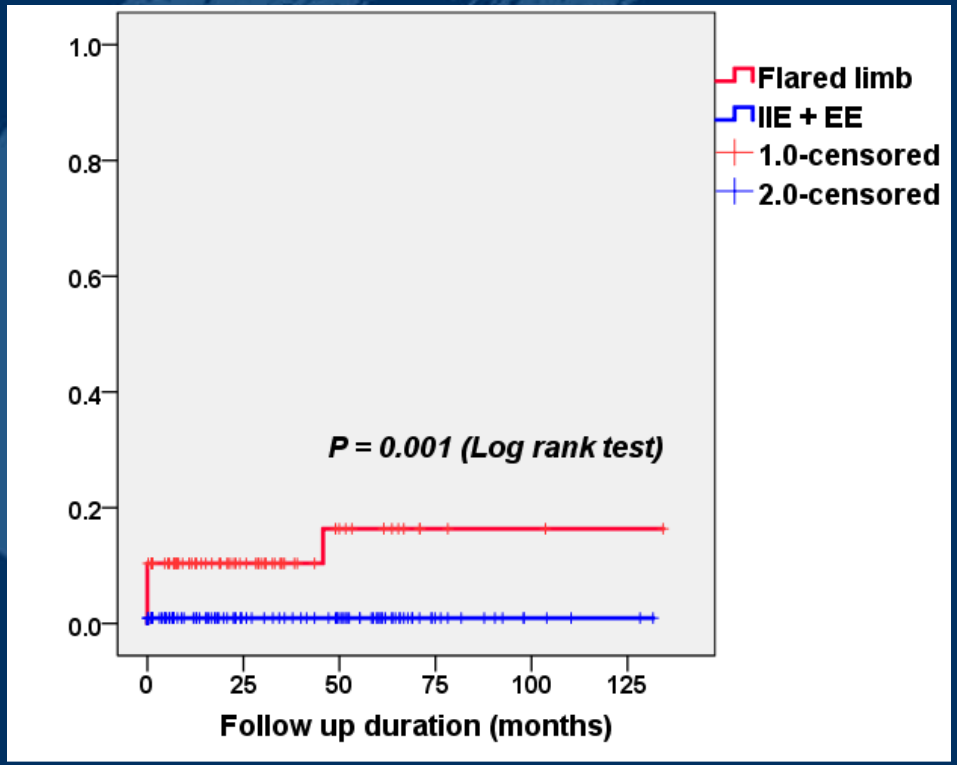
	Flared limb (n=77)	IIE + EE (n=107)	Total (n=184)	P-value
Type Ib	1 (1.3)	0	1 (0.5)	0.418[c]
Type III	0	0	0	
Limb occlusion or stenosis (>50%)	1(1.3)	1 (0.9)	2 (2.2)	1.000[c]
Re-intervention	2 (2.6)	1 (0.9)	3 (1.6)	1.000[c]
Mortality[a]	7 (9.1)	11 (10.3)	18 (9.8)	0.789[b]
Median OPD f/u (IQR, mo)	20.9 (7.5-38.2)	30.4 (6.9-61.6)	24.4 (7.5-55.3)	0.116[b]
Median CT/duplex f/u (IQR, mo)	12.0 (1.7-31.8)	17.8 (4.2-51.7)	14.1 (3.6-44.3)	0.159[b]

[a] No aneurysm-related mortality

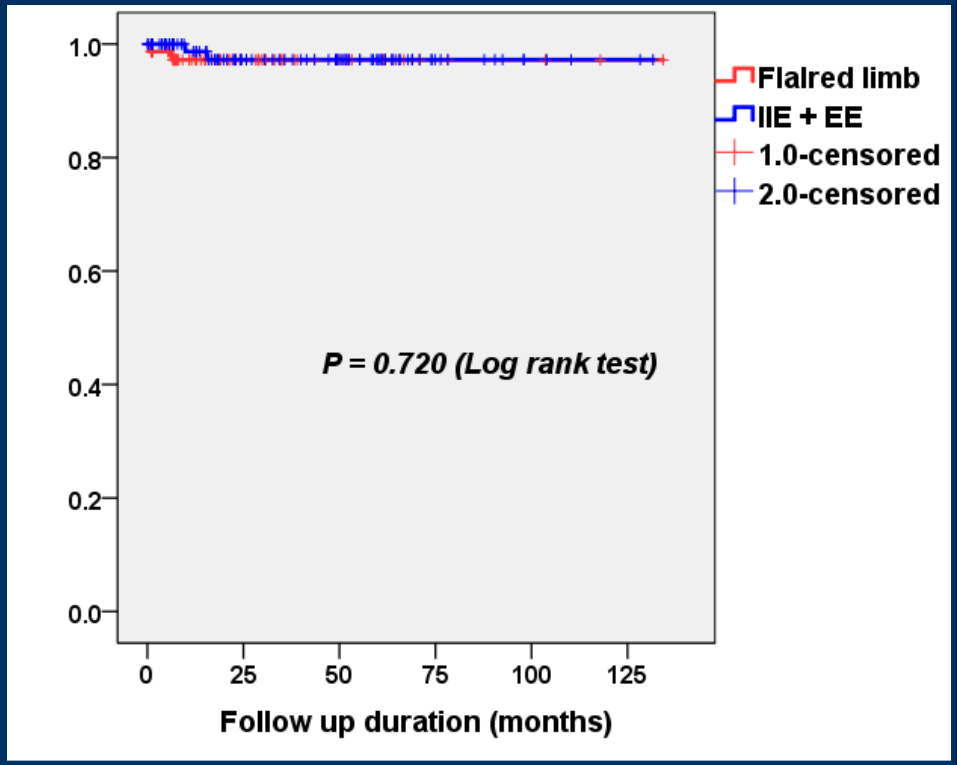
[b] Chi-square test; [c] Fisher's exact test

Results

Cumulative Type 1b/3 endoleak

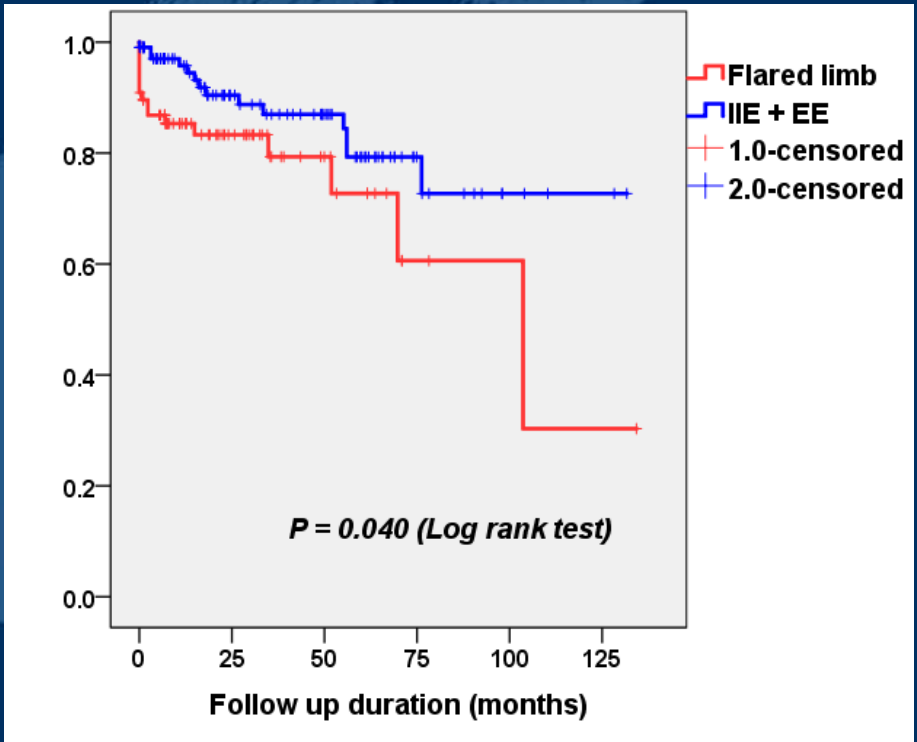


Cumulative Limb patency

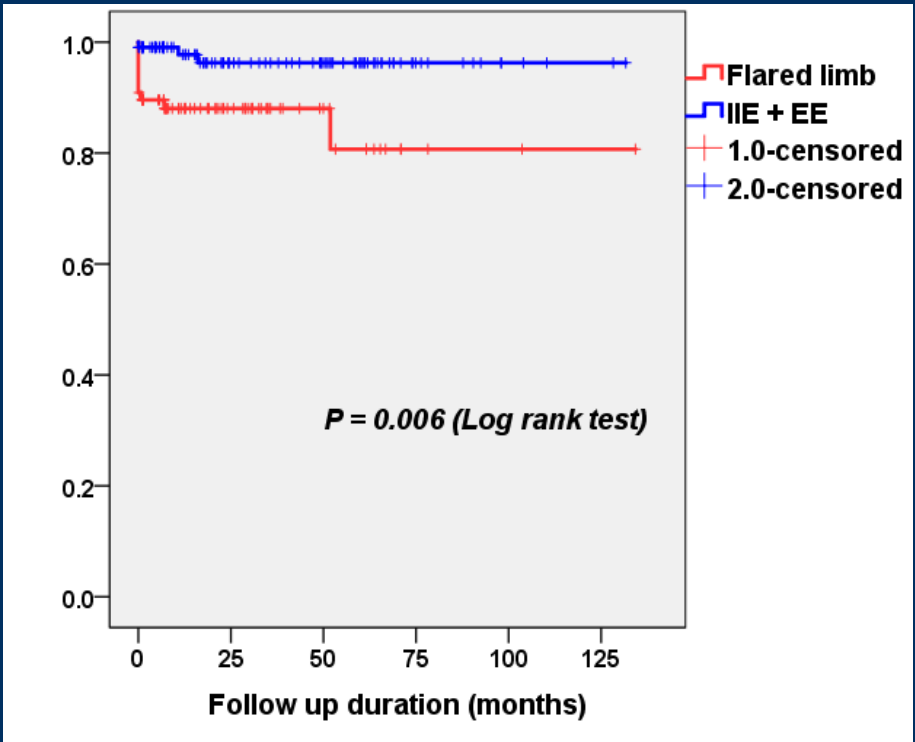


Results

Reintervention-free patients survival

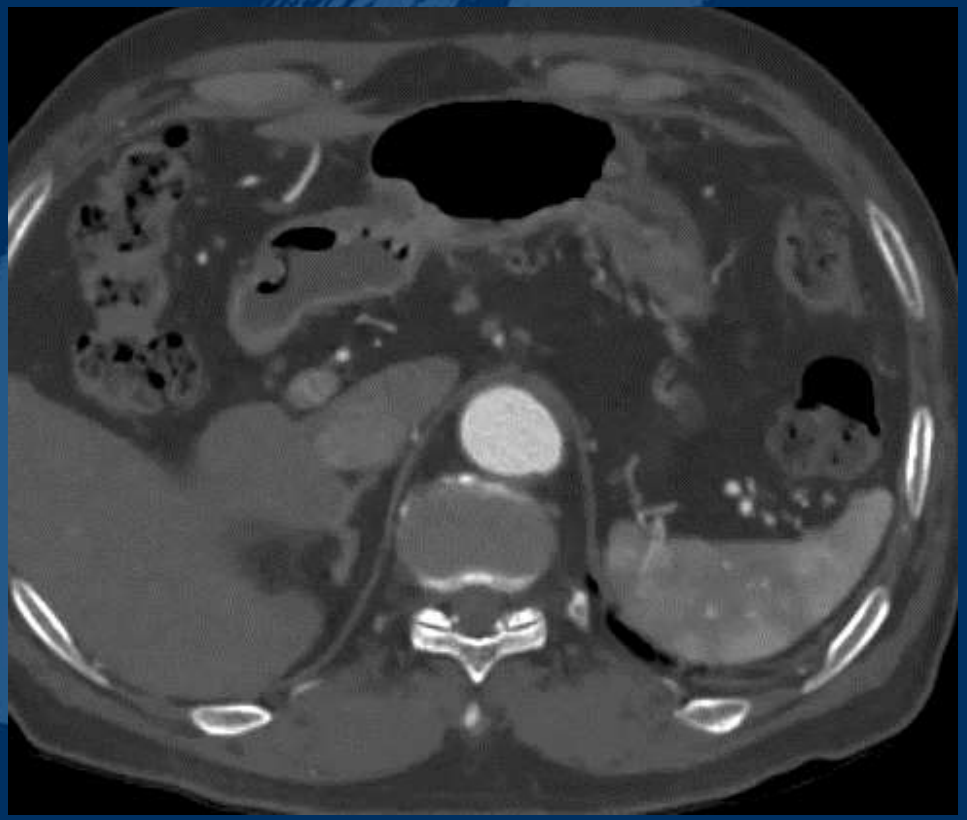


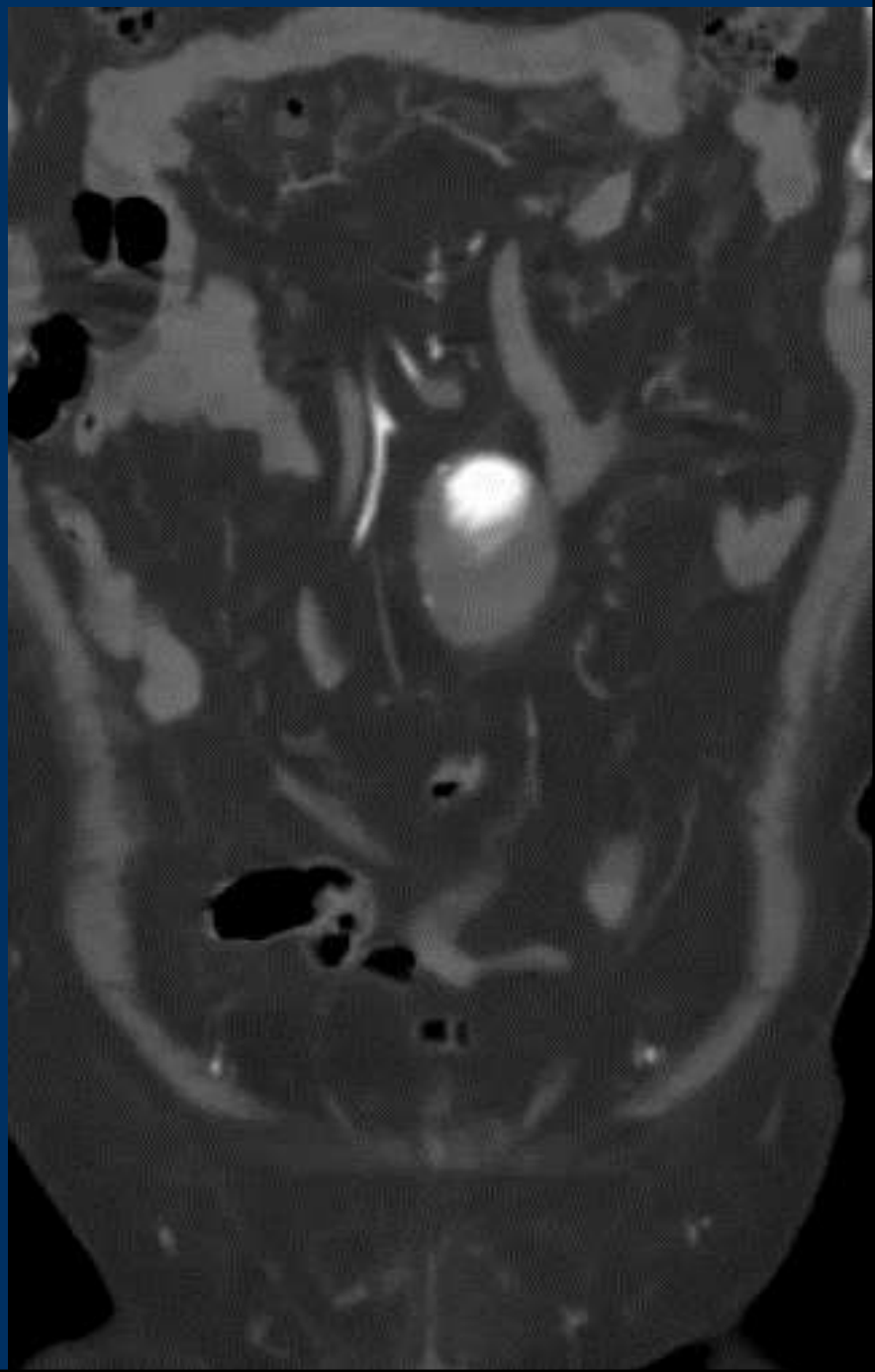
Reintervention-free rate (%)



Case 1.

- 82/M
- 2017.8.18 EVAR d/t AAA (53mm)



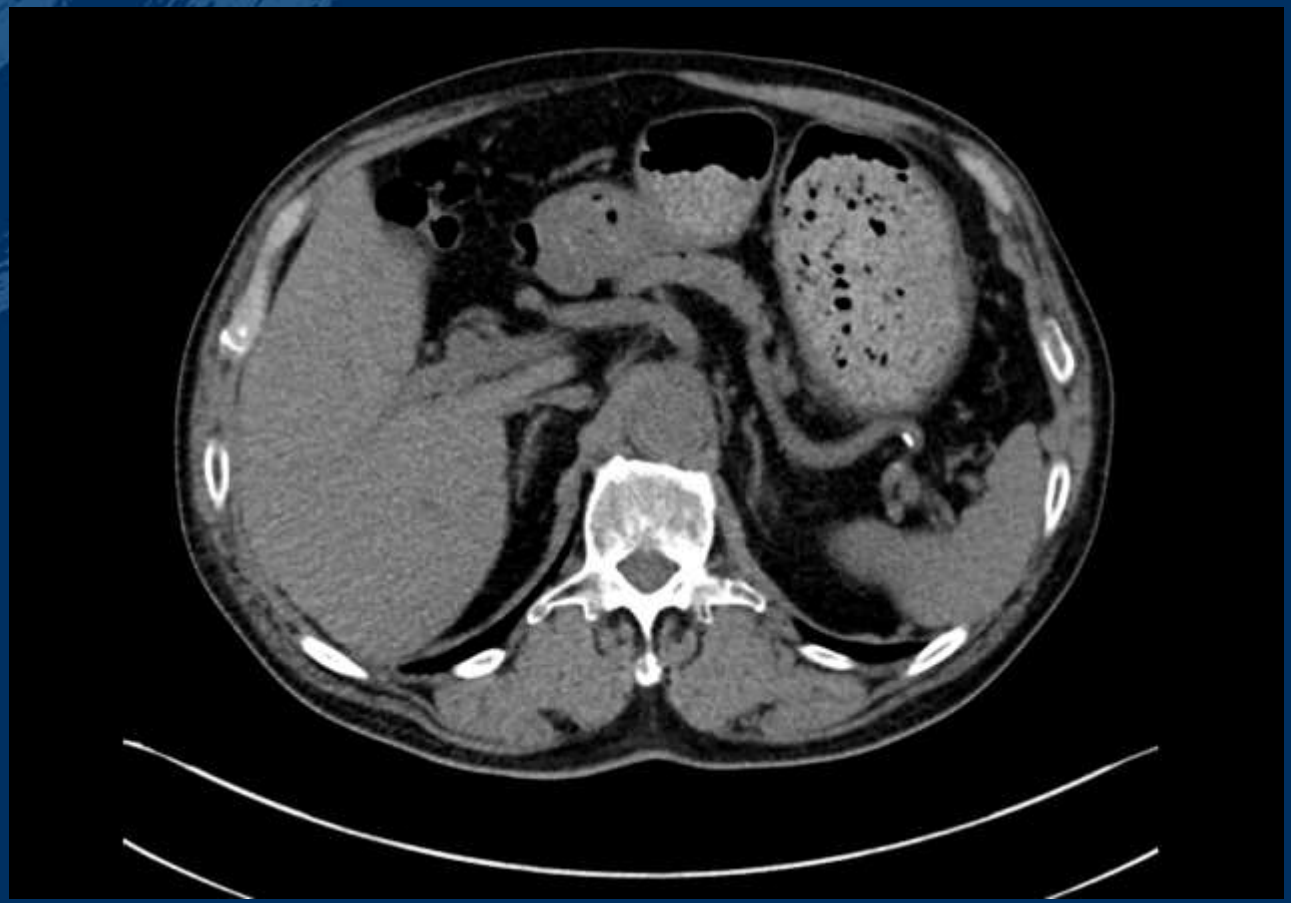




Right
FINAL

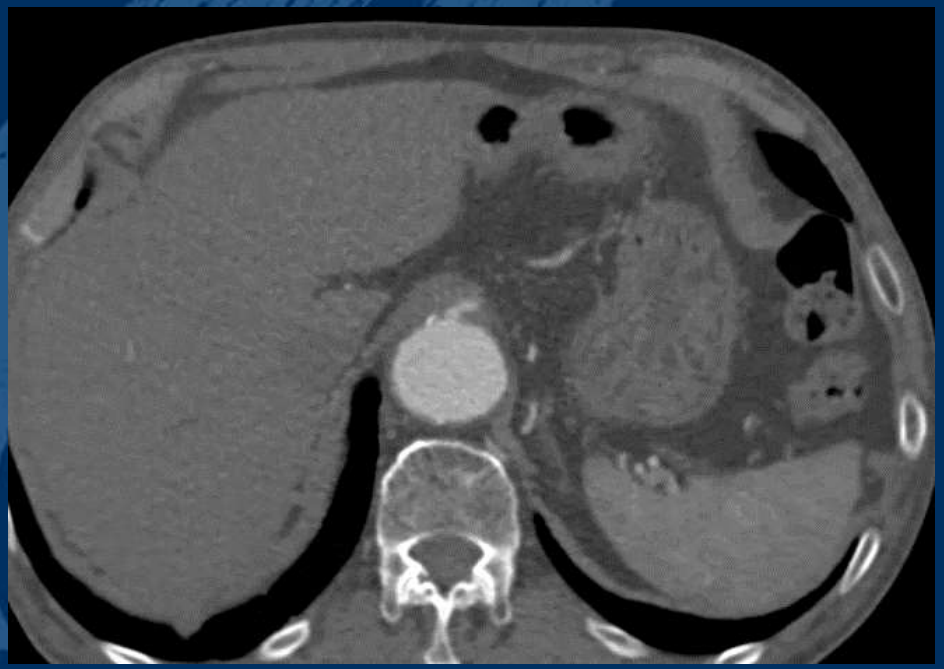
Case 2.

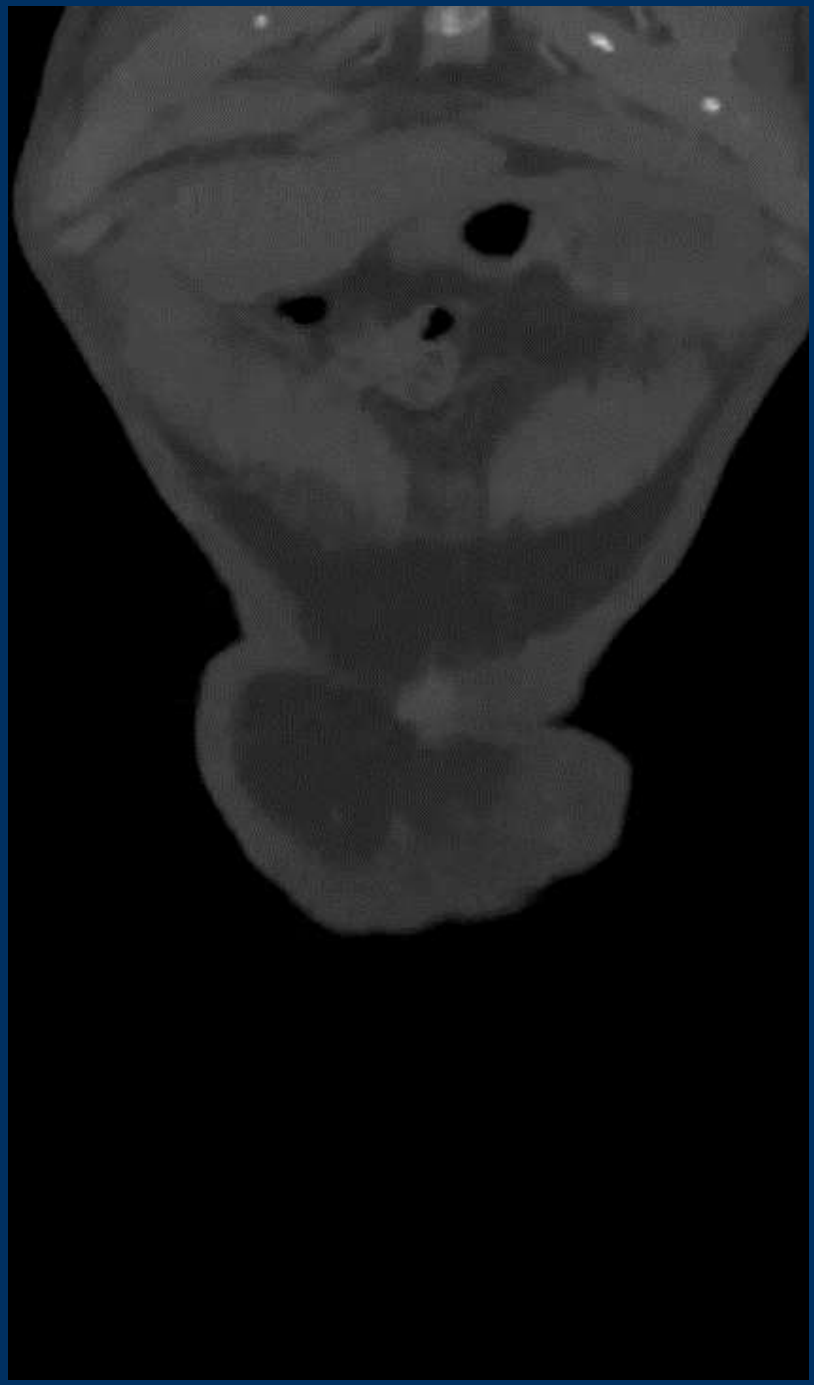
- 78/M
- 2013.6.28 EVAR d/t AAA (51mm)

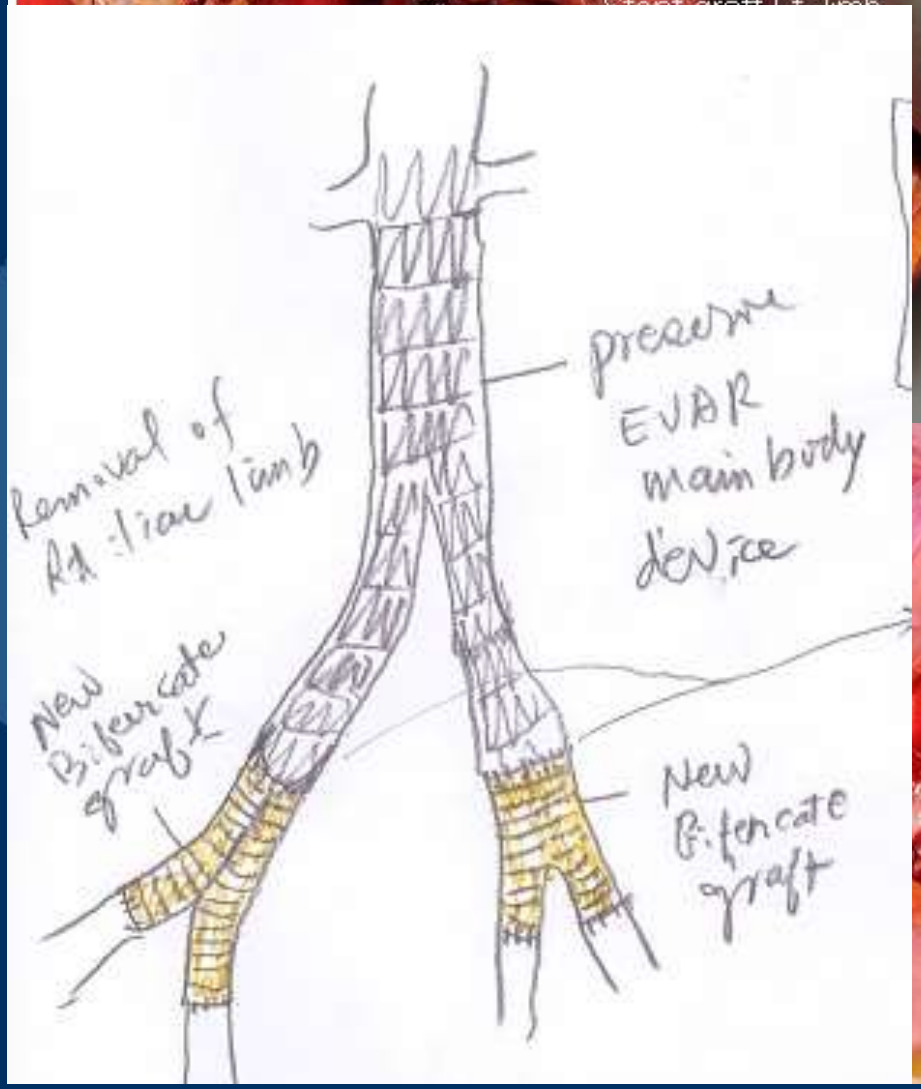



[H]

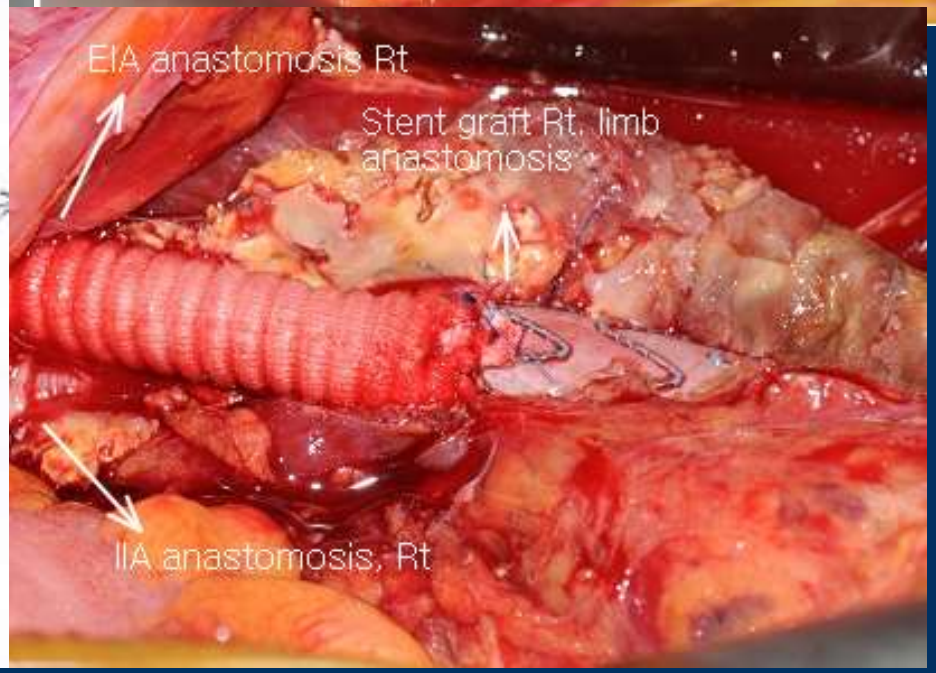
4 years later






Removal of Rt iliac limb
preserve EVAR main body device
New Bifurcate graft
New Bifurcate graft


IIA anastomosis
EIA anastomosis


EIA anastomosis Rt
Stent graft Rt. limb anastomosis
IIA anastomosis, Rt

Conclusions

- There was a significant higher incidence of type 1b endoleak and intraoperative adjuvant or 2nd re-intervention in flared limb group compared to limb extension during EVAR in the mid-term

- Close long term follow-up and careful surveillance is mandatory

- Further study for the risk factors which could be related with late type 1b EL after flared iliac limb usage, would be necessary.

Thank you for your kind attention

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