

# Type II Endoleak and Aortic Aneurysm Sac Shrinkage after Pre-emptive Embolization of Aneurysm Sac Side Branches



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Speaker name:

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I have the following potential conflicts of interest to report:

**1. Grants to the University of Leipzig:**

BD Bard, Bentley Innomed

**2. Travel Grants:**

COOK Medical, Beyer Medical, Terumo Aortic

**1. Non-financial support:**

Medyria AG, LimFlow Medical, Vivasure Medical Ltd, Endologix

- ☛ T2EL is generally considered benign, its management being controversial

Wanhainen A et al. Eur J Vasc Endovasc Surg 2019

- ☛ Recent studies with large patient cohorts and longer FU have identified T2EL as a cause of late rupture, affecting long-term outcomes after EVAR

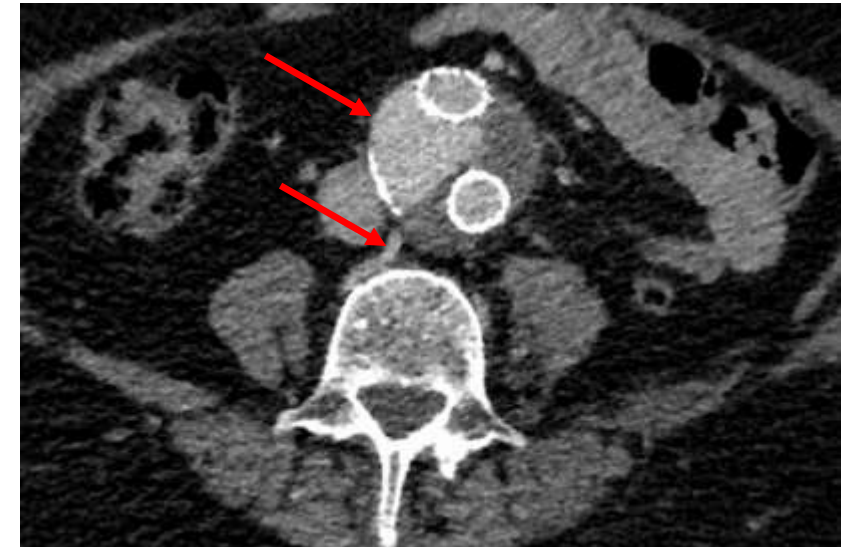
Sakaki M, et al. Ann Vasc Surg 2020

Dijkstra ML, et al. J Vasc Surg 2019

- ☛ Limited success rates of 62.5% after T2EL treatment have been reported

- ☛ Recurrence of T2EL at 3 years is diagnosed in more than half of the treated patients

Ultee KHJ, et al. Eur J Vasc Endovasc Surg 2018



# Prevention of T2EL: pre-EVAR Embolization of IMA

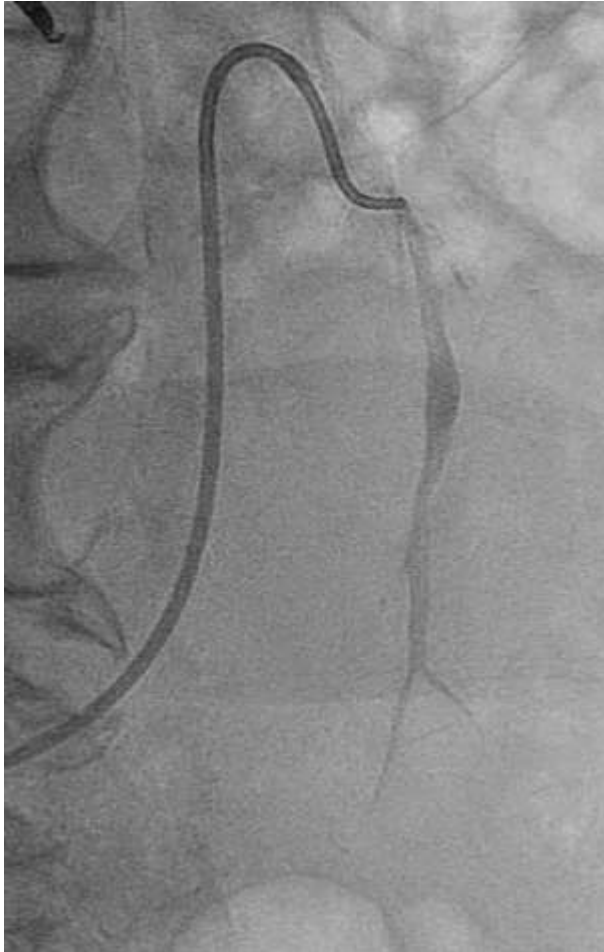
- ☞ Randomized controlled trial to IMA-coiling before EVAR
- ☞ 106 patients with ‚high-risk‘ for T2EL
  - IMA  $\geq$  3mm
  - LAs  $\geq$  2mm
  - aorto-iliac type aneurysm

Samura et al. *Ann Surg* 2019

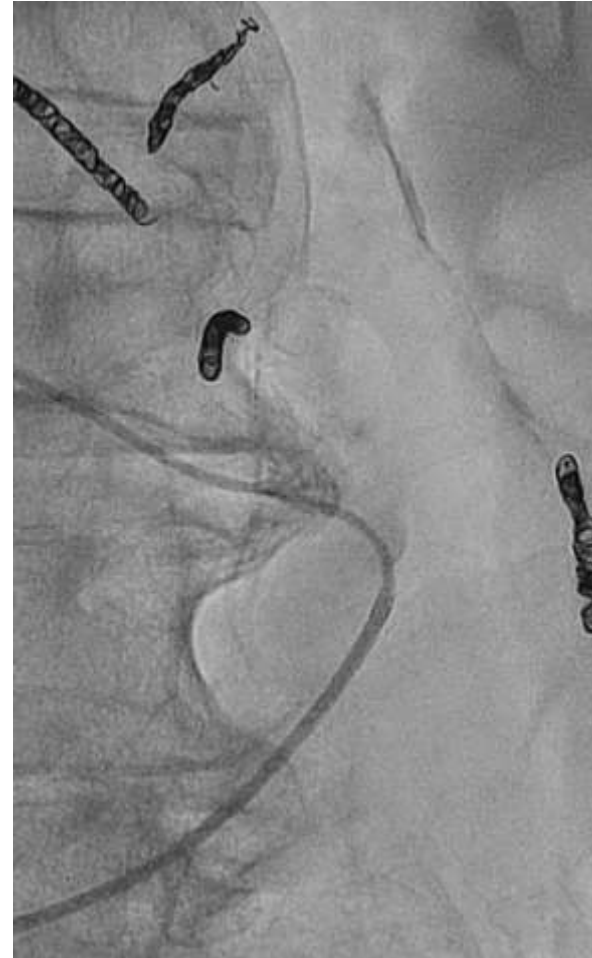
	Pre-EVAR- IMA-coiling	No Pre-EVAR -coiling	P
Incidence of T2EL	24.5%	49.1%	0.009
AAA $\emptyset$ -shrinking	- 5.7 $\pm$ 7.3mm	- 2.8 $\pm$ 6.6mm	0.037
AAA $\emptyset$ -growth related to T2EL	3.8%	17.0%	0.03

# Systematic Embolization of Aneurysm Side Branches before EVAR - Leipzig Experience

## IMA Embolization



## L2, L3 Embolization



# Systematic Embolization of Aneurysm Side Branches before EVAR - Leipzig Experience

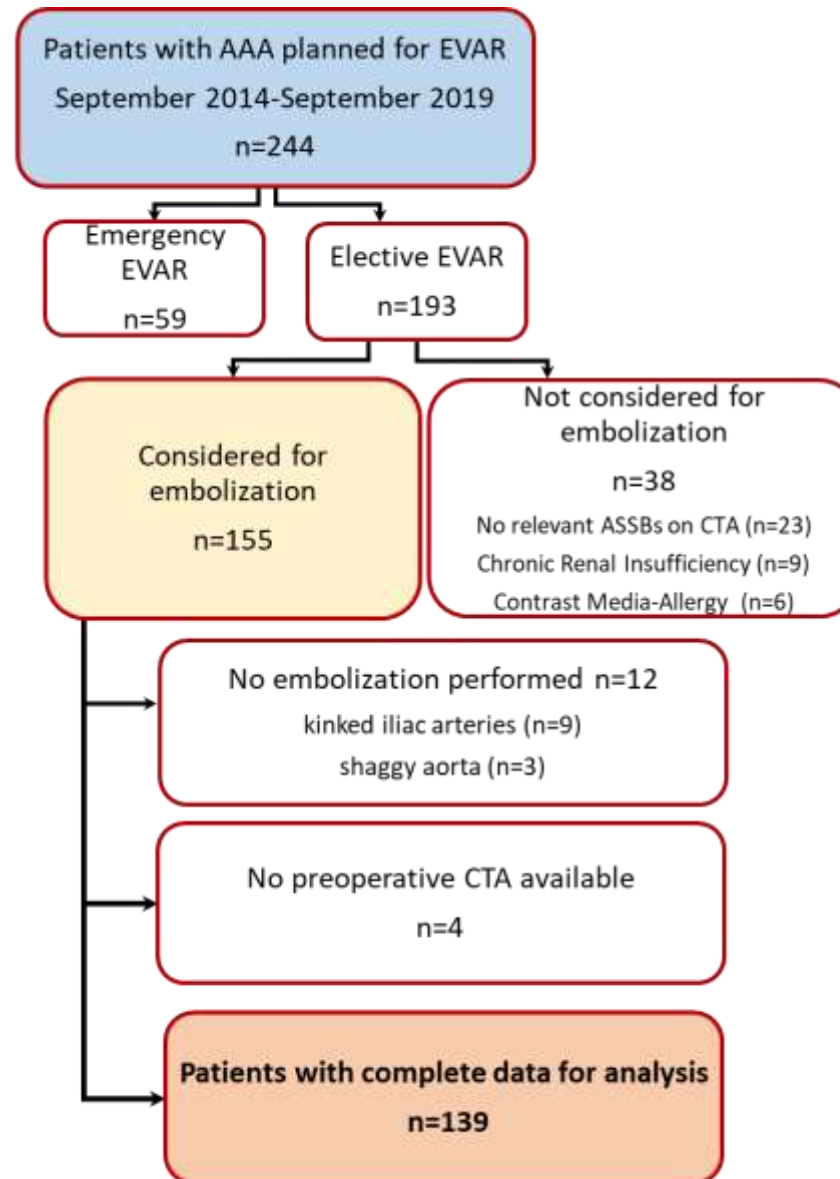
## L4 Embolization



## Final Result



# Systematic Embolization of Aneurysm Side Branches before EVAR - Leipzig Experience



**57% of all AAA**

# Fate of Aneurysm Sac Side Branches during EVAR

	Open	Embolized		Open before EVAR	
		n	%	n	%
<b>LA</b>	481	370	76.9	111	23.1
<b>IMA</b>	108	86	79.6	22	20.4
<b>Others</b>	37	22	59.5	15	40.5
<b>Total</b>	626	478	76.4	148	23.6
<b>Median</b>	5 (1-8)	3 (1-8)		1 (0-5)	

## EVAR Procedure

Variables	N	%
<b>Local Anesthesia</b>	114	82
<b>Percutaneous access</b>	139	100
<b>Aortobiiliac Graft</b>		
with polymer sealing	52	37.4
standard graft	87	62.6



# 30-Days Results after EVAR

Variables		N	%
<b>Mortality</b>		1	0.7
<b>Complications</b>	PSA	4	2.9
	Backpain	1	0.7
	Limb occlusion	3	2.2
	Graft infection	1	0.7
<b>Reinterventions</b>		5	3.6

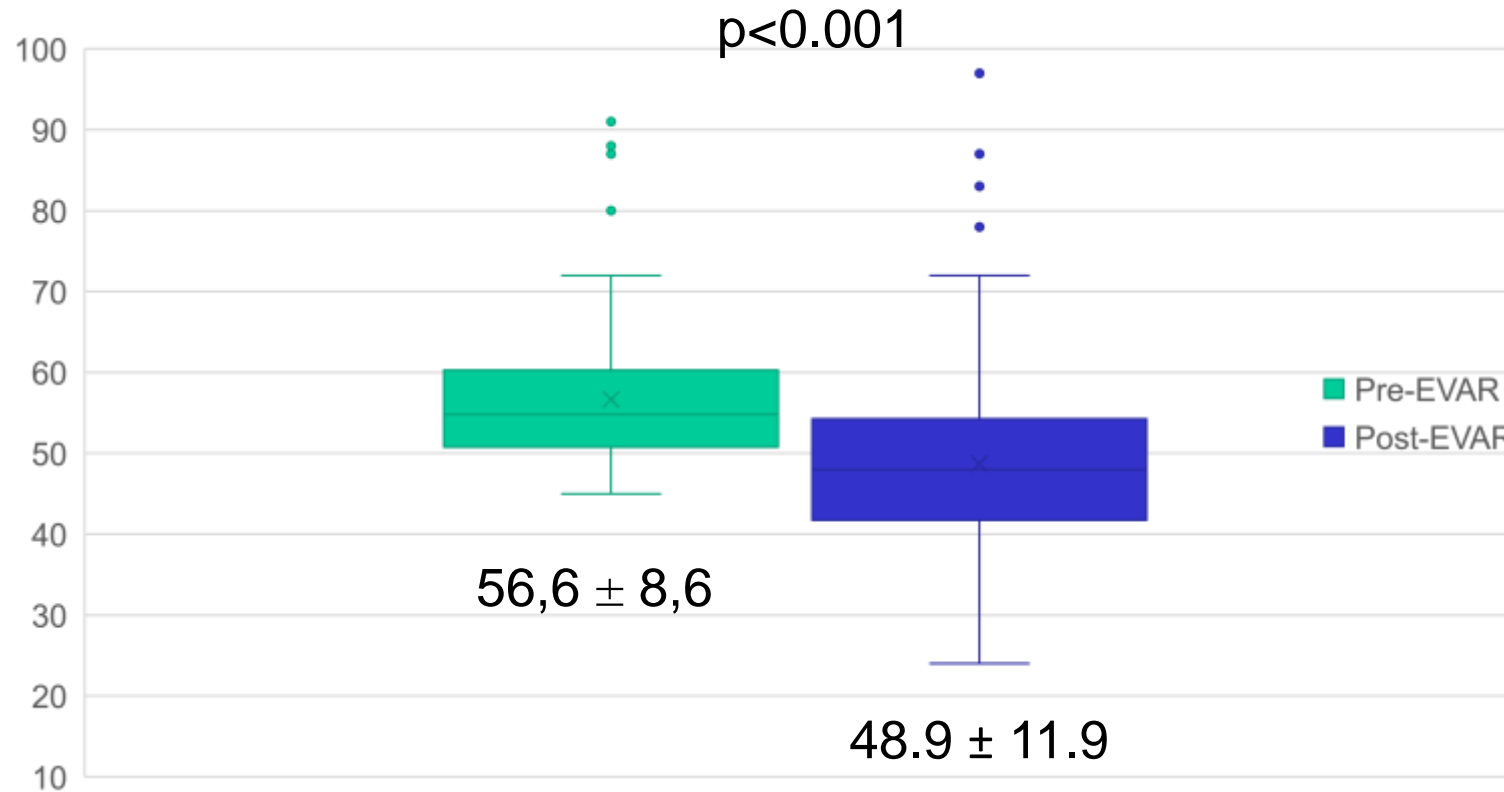
## Mid-Term FU after EVAR: 1.9 ± 1.3 years

Variables	N	%
<b>Endoleak Type II</b>	7	5
<b>Mortality on FU (non-AAA related)</b>	14	10

# Discriminative Factors for T2EL

Variables	No T2EL	Persistent T2EL	p
	n=132	n=7	
Age (years)	74.5 ± 8.0	79.3 ± 3.4	0.128
Male gender	116	6	0.865
AAA diameter (mm)	56.7 ± 8.8	55.4 ± 7.4	0.707
Atherosclerotic AAA	130	7	0.744
Post-dissection AAA	2	0	0.744
PAU	24	1	0.794
Hypertension	125	7	0.533
DM	42	4	0.167
CAD	52	4	0.353
Hyperlipidemia	84	4	0.709
Tobacco	90	4	0.544
COPD	26	0	0.194
PAOD	41	0	0.08
BMI (Kg/m <sup>2</sup> )	28.0 ± 4.1	25.6 ± 3.7	0.199
Patent ASSB before embolization	4.5 ± 1.6	5.3 ± 1.5	0.209
Polymer-sealing stentgraft	36.4%	57.1%	0.270
Nr. embolized ASSBs	3.5 ± 1.6	2.4 ± 1.6	0.111
Patent ASSBs after embolization	1 ± 1.1	2.9 ± 1.2	<.001

# Aneurysm Sac Diameter (mm) during Follow-Up



**Mean AAA diameter reduction: 9.2 ± 7.7mm**

# AAA-Shrinkage in Comparison to Literature

Leipziger Cohort:  $1.9 \pm 1.3$  years

<b>Total Number</b>	<b>139</b>
<b>Decreased</b>	<b>86.7%</b>
Stable	6.7%
Increased	6.7%

Branzan D et al, J Vasc Surg 2020

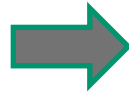
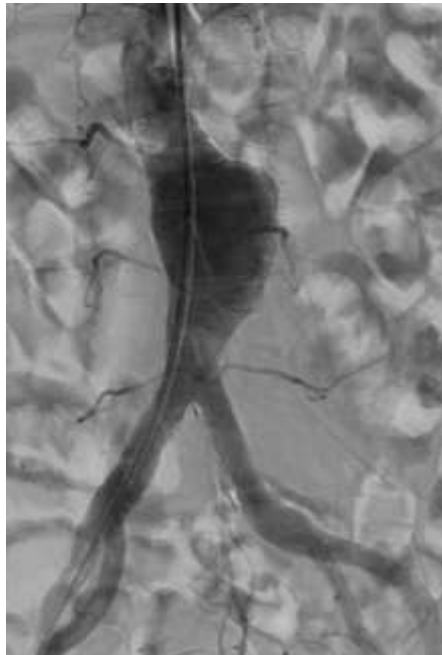
ENGAGE Registry (Endurant): @2 years

<b>Total Number</b>	<b>939</b>
<b>Decreased</b>	<b>38.1%</b>
Stable	48.7%
Increased	2.6%

Dijkstra ML, et al. J Vasc Surg 2019

# Conclusions

- Pre-emptive embolization of ASSBs for patients with AAA is safe and effective in preventing T2EL after EVAR.
- Aneurysm sac shrinkage is observed in a high proportion of patients.



# Thank you!



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