

Increased complexity of FEVAR equals increased complications

M. Austermann

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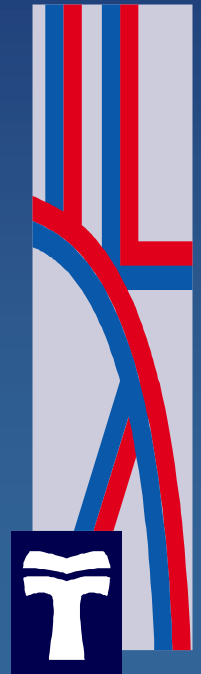
St. Franziskus Hospital Münster

Head: Univ.- Prof. Dr. G. Torsello

PD Dr. med. Martin Austermann

Senior consultant and

Leader of section „endovascular aortic therapy“



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Disclosure

- Speaker name:
-**Priv.-Doz. Dr. Martin Austermann**
.....
- I have the following potential conflicts of interest to report:
 - Consulting /Proctorship **Cook** and **Gore**
 - Employment in industry
 - Stockholder of a healthcare company
 - Owner of a healthcare company
 - Other(s)
- I do not have any potential conflict of interest

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Zenith[®] Fenestrated AAA Endovascular Graft:

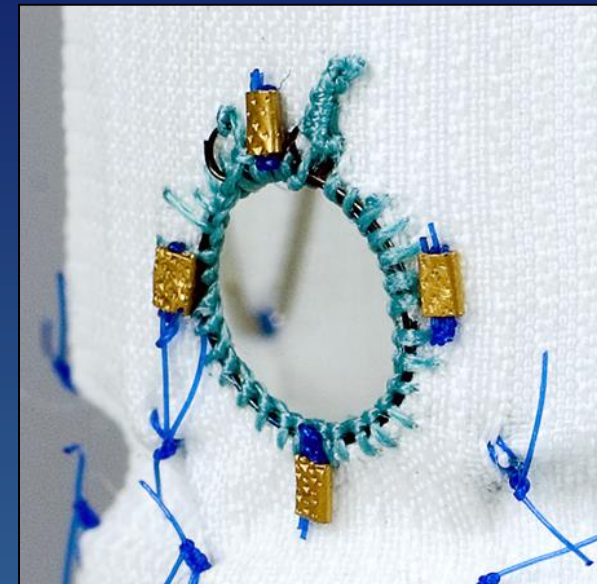


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scallop

Höhe 6 – 12 mm
Breite 10 mm
Option double wide

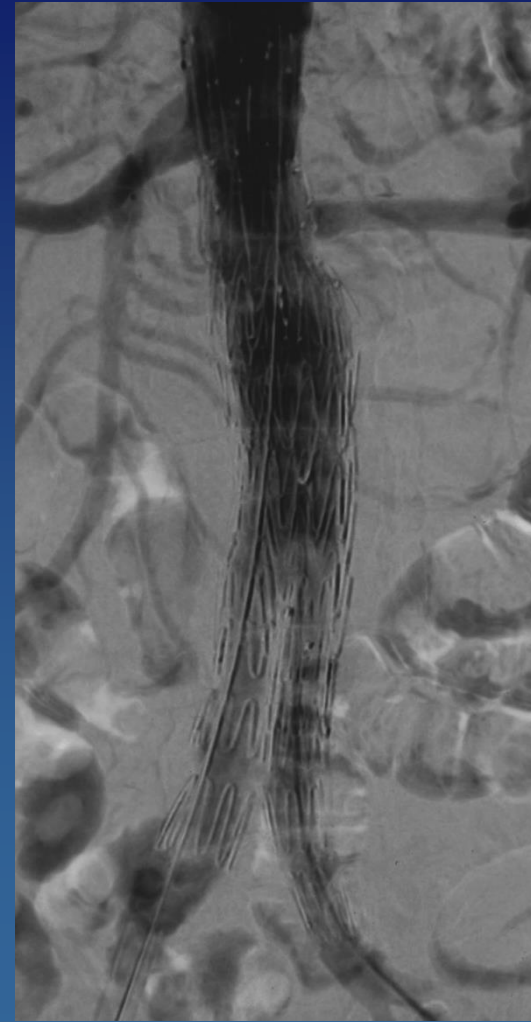


small fenestration

Höhe 6-8 mm
Breite 6 mm

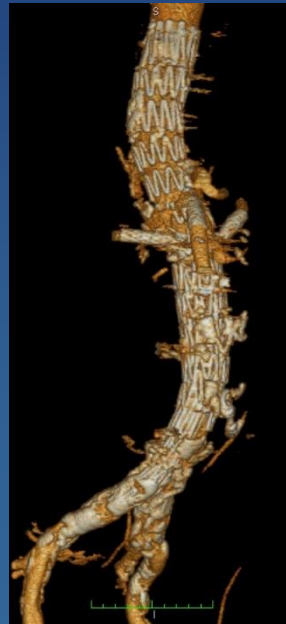
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FEVAR with scallop re NA ,small fenestration li NA



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Complex FEVAR with 4 fenestrations



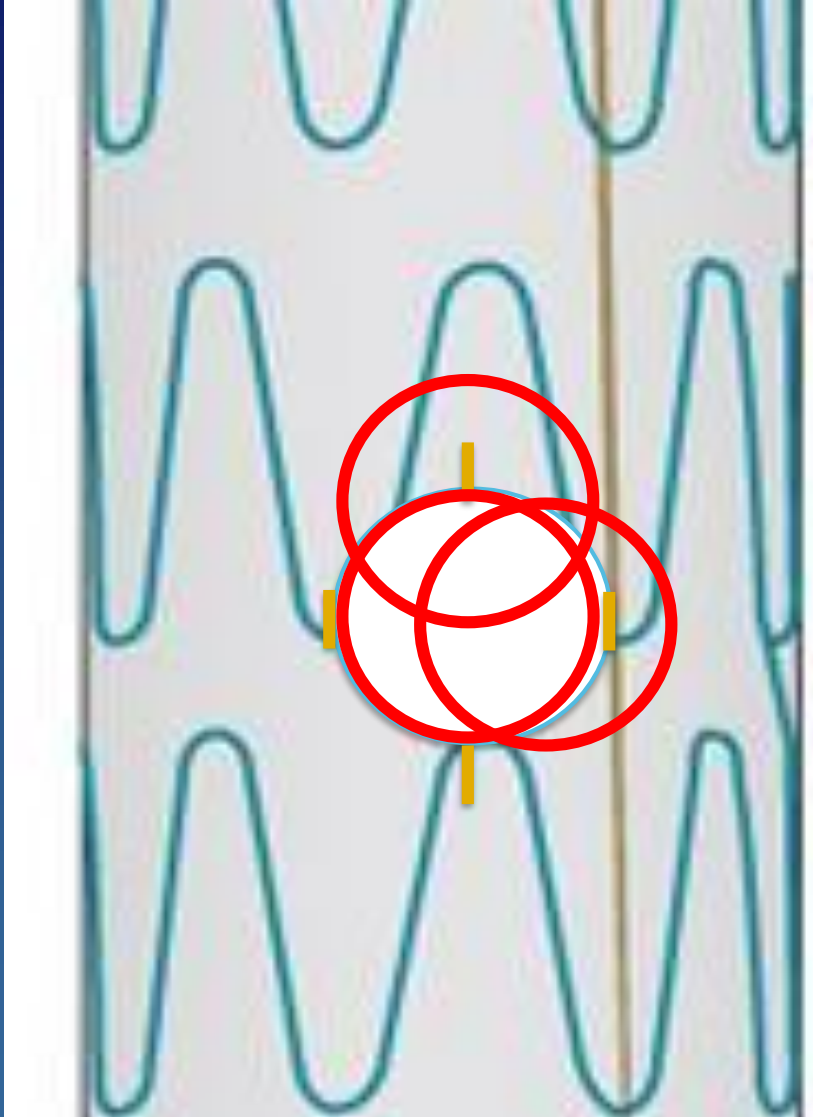
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Fenestrations:



Not forgiving!

Crucial:

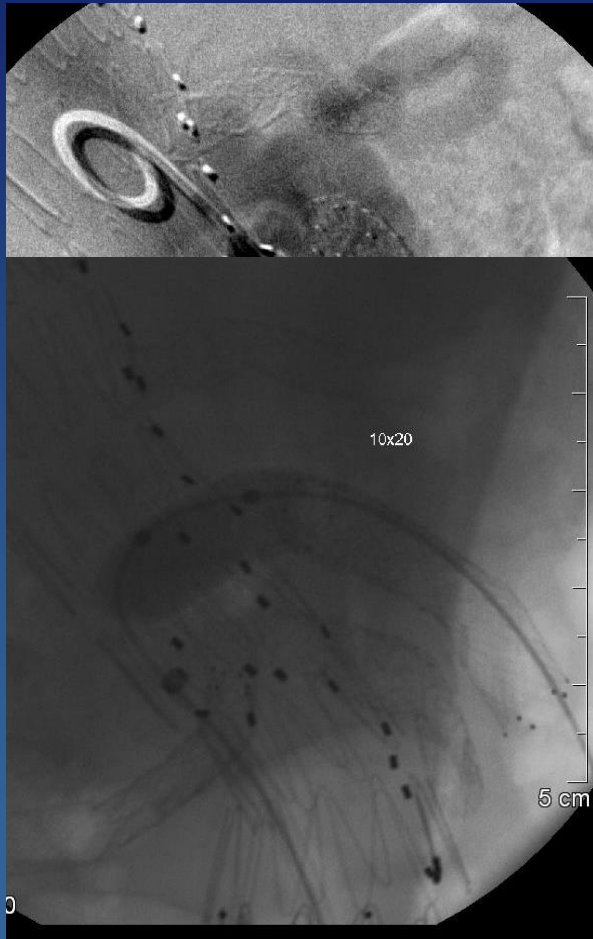
Exact sizing, planning
and implantation.

Meticulous patient selection.

Increased complexity of FEVAR equals increased complications

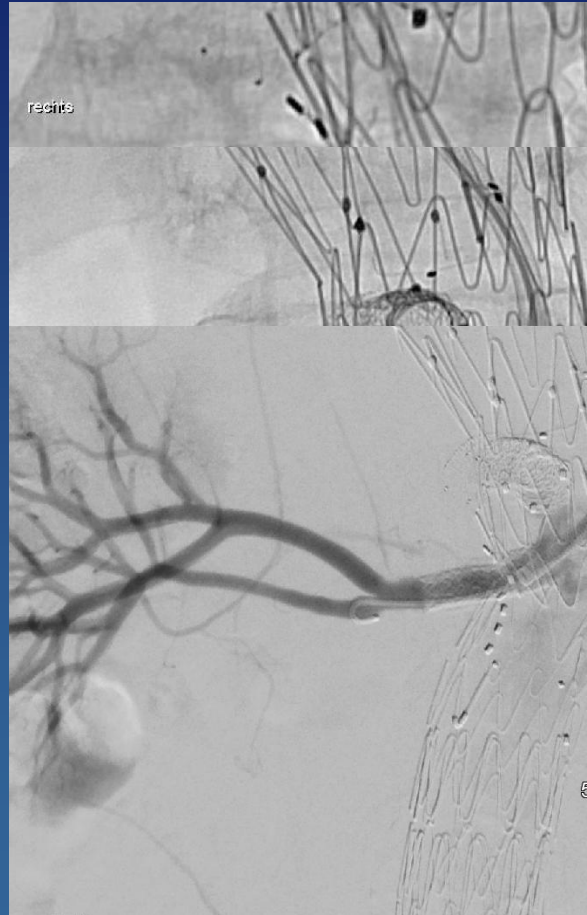
Complications of FEVAR

BSG-Dislocation 2 Y
after FEVAR



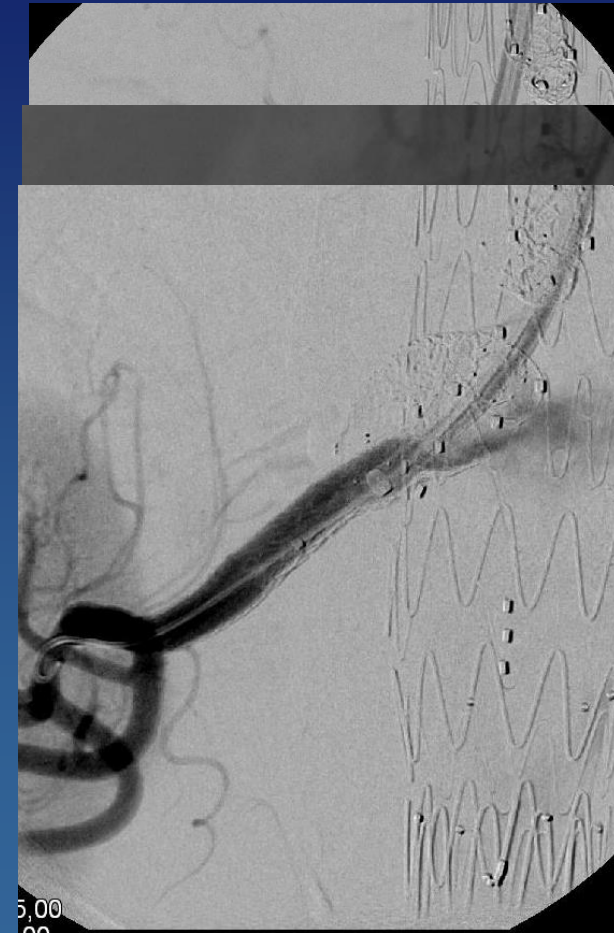
Therapy:
Relining with 8x38 V12

Crushing RRA BSG
6 month after FEVAR



Therapy:
Relining with 6x26 Begraft +

Type 1 c Endoleak
6 month after FEVAR

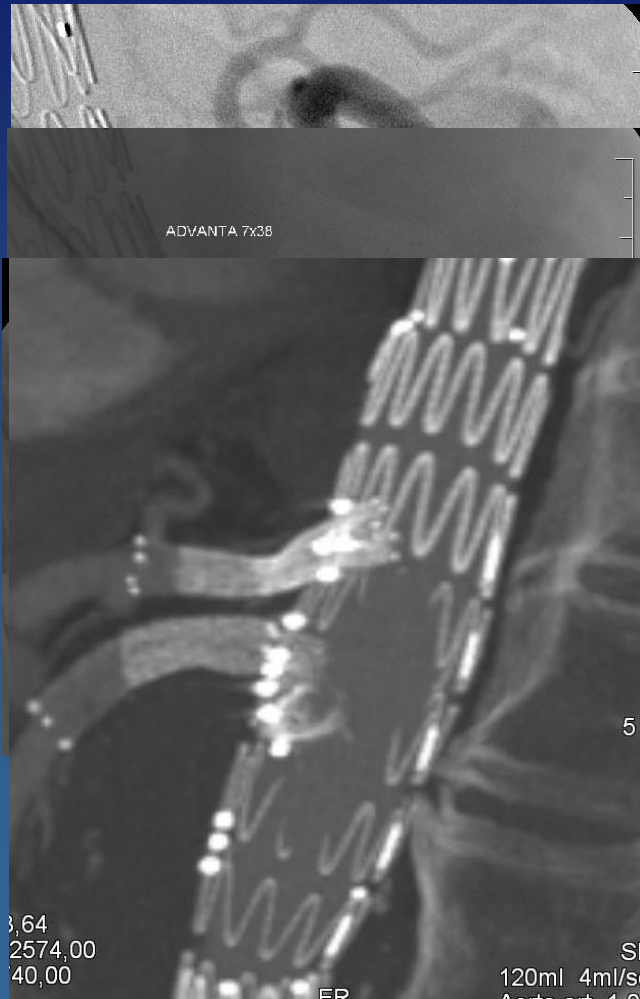


Therapy:
PTA and BSG-Extension with SECS

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Complications of FEVAR

CT-Stenosis 1year after FEVAR



Therapy:
Extension BSG with BECS and SES

Dislocation RRA BSG



Therapy: Relining with BECS

Increased complexity of FEVAR equals increased complications

Long-term follow-up of fenestrated endovascular repair for juxtarenal aortic aneurysm

I. N. Roy^{1,3} , A. M. Millen¹, S. M. Jones¹, S. R. Vallabhaneni^{1,3}, J. R. H. Scurr¹, R. G. McWilliams², J. A. Brennan¹ and R. K. Fisher¹

BJs 2017; **104**: 1020–1027

N=173, mean age=76, 90% male

Table 2 Fenestrated endovascular aneurysm repair stent-graft configuration in a single UK centre

No. of target vessels	No. of patients	Coeliac axis	SMA	RRA	LRA
4 (44.5)	30	Fenestration	Fenestration	Fenestration	Fenestration
	47	Scallop	Fenestration	Fenestration	Fenestration
3 (46.8)	11		Fenestration	Fenestration	Fenestration
	62		Scallop	Fenestration	Fenestration
	4	Fenestration	Fenestration	Fenestration to RRA or LRA renal	
	3	Scallop	Fenestration	Fenestration to RRA or LRA renal	
2 (3.5)	1		Scallop	Scallop	Fenestration
	1*	Fenestration	Fenestration		
	1		Fenestration	Fenestration	
	1		Scallop	Fenestration	Fenestration
	1			Fenestration	Scallop
1 (5.2)	2			Fenestration	
	9			Scallop to RRA or LRA renal	

Values in parentheses are percentage of patients. *Patient with end-stage renal failure on dialysis. SMA, superior mesenteric artery; RRA, right renal artery; LRA, left renal artery.

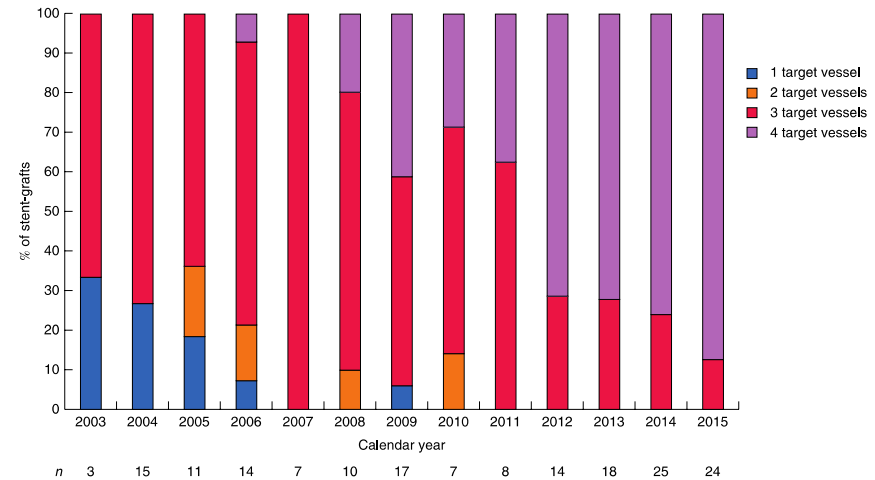


Fig. 1 Percentage of stent-grafts with each number of target vessels by calendar year

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BJs 2017; **104**: 1020–1027

30d mortality: **5,2% (9 pt)**

3 visceral ischemia (4 and 3 fens)

2 myocardial infarction

2 MOF

1 retroperitoneal bleeding

1 aspiration and pneumonia

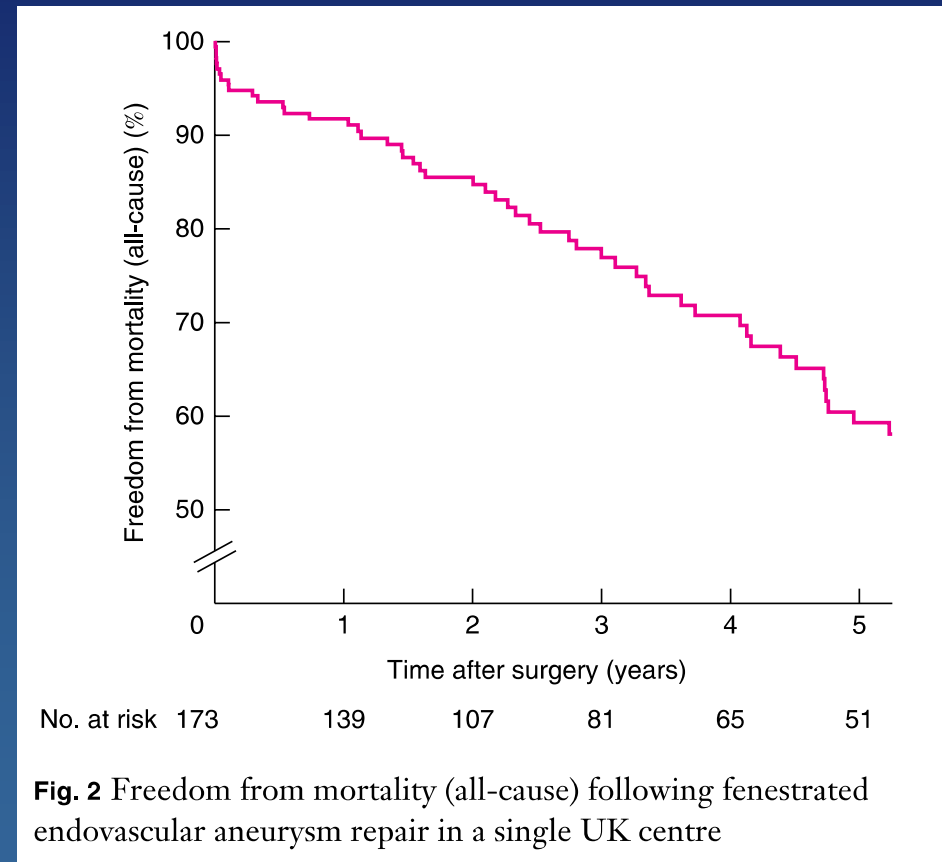
30d mortality 1 and 2 fens:

2% 2/83 pt

30d mortality 3 and 4 fens:

8% 7/90 pt

P=0,059



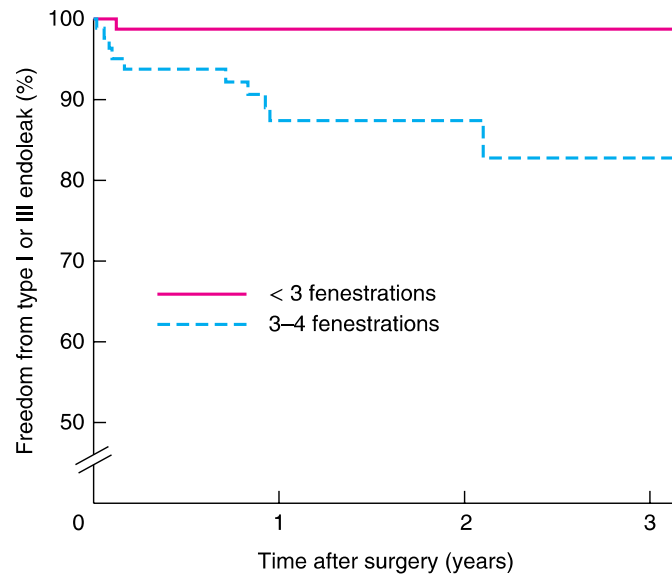
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BJS 2017; **104**: 1020–1027

Long-term follow-up of fenestrated endovascular repair for juxtarenal aortic aneurysm

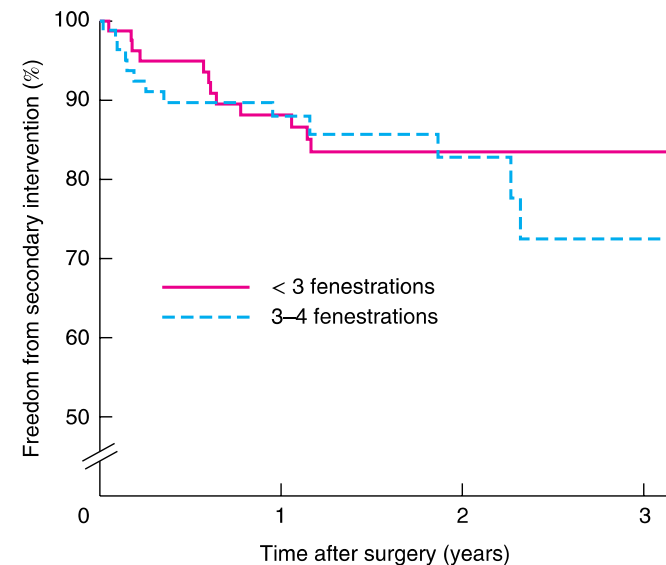
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Median FU 34 months
IQR 16 – 50 months



No. at risk				
< 3	83	66	55	44
3-4	90	45	28	15

Fig. 3 Freedom from type I or III endoleak following fenestrated endovascular aneurysm repair in a single UK centre in relation to number of fenestrations in stent-graft. $P < 0.001$ (log rank test)



No. at risk				
< 3	83	58	46	37
3-4	90	45	27	13

Fig. 4 Freedom from secondary intervention following fenestrated endovascular aneurysm repair in a single UK centre in relation to number of fenestrations in stent-graft. $P = 0.508$ (log rank test)

Increased complexity of FEVAR equals increased complications

Early Results of Fenestrated Endovascular Repair of Juxtarenal Aortic Aneurysms in the United Kingdom

On behalf of the British Society for Endovascular Therapy and the Global Collaborators on Advanced Stent-Graft Techniques for Aneurysm Repair (GLOBALSTAR) Registry

N=318 pt from 14 centers

Perioperative mortality: 4,1%

Group 1 (renal fenestrations)	2,7%	2/73
Group 2 (renal fens and scallop SMA)	2,9%	5/168
Group 3 (incorporation of the CT)	9,4%	6/64

P=0,098 n.s.

(Circulation. 2012;125:2707-2715.)

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Comparison of outcomes for double fenestrated endovascular aneurysm repair versus triple or quadruple fenestrated endovascular aneurysm repair in the treatment of complex abdominal aortic aneurysms

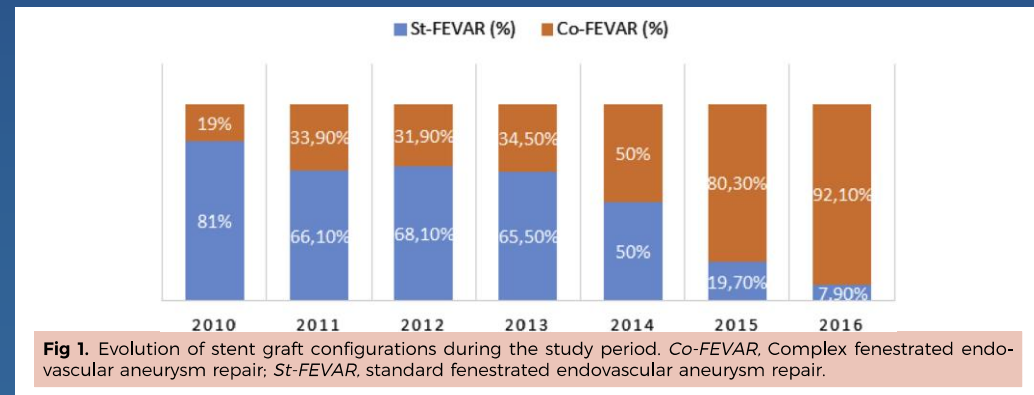
Athanasios Katsargyris, MD,^a Kyriakos Oikonomou, MD,^a George Kouvelos, MD,^a Hozan Mufty, MD,^a Wolfgang Ritter, MD,^b and Eric L. G. Verhoeven, MD, PhD,^a Nuremberg, Germany

Journal of Vascular Surgery
 ■■■ 2017

N=384

Table I. Demographic data, aneurysm characteristics, and cardiovascular risk factors

Variable ^a	St-FEVAR (n = 199)	Co-FEVAR (n = 185)	P
Age, years	72.6 ± 7.8	72.9 ± 7.9	.7
Male gender	85.9	94.1	.1
Aneurysm diameter, mm	59.9 ± 10	62 ± 10.3	.054
Aneurysm neck length, mm	2.3 ± 2.2	0.9 ± 1.6	<.001 ^b
Hypertension	78.4	76.2	.63
Diabetes mellitus	17	10	.08
CAD	58.3	56.2	.76
COPD	46.2	53	.22
Serum creatinine >100 μmol/L	40.7	47	.22
ASA Physical Status ≥III	36.7	44.9	.119



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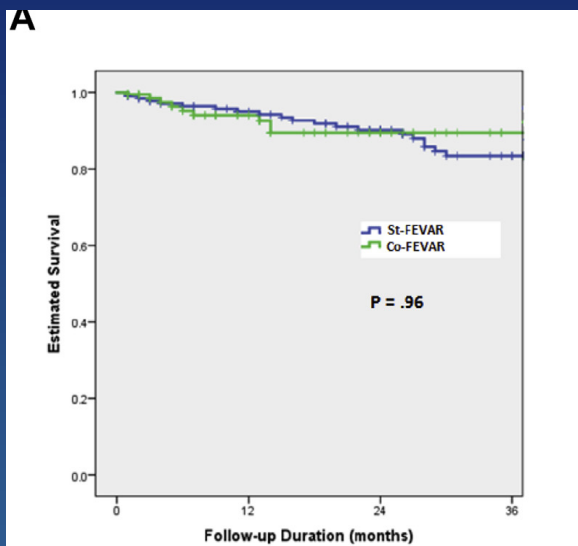
Comparison of outcomes for double fenestrated endovascular aneurysm repair versus triple or quadruple fenestrated endovascular aneurysm repair in the treatment of complex abdominal aortic aneurysms

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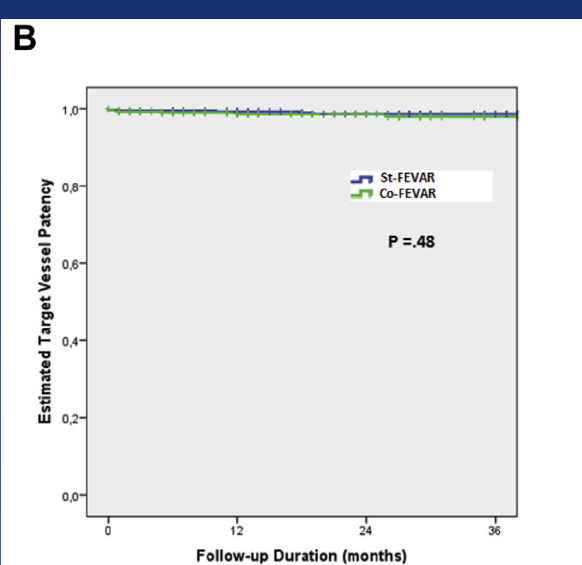
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Survival



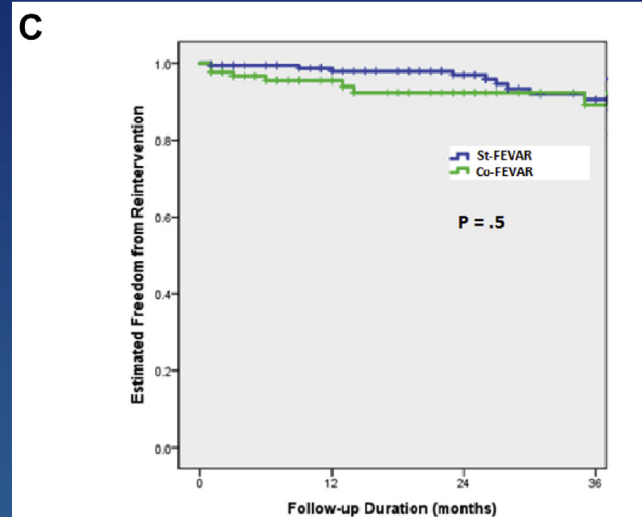
	Time (months)	12	24	36
Standard 2x FEVAR	Patients at risk	130	95	61
	Standard Error (%)	1.7	2.5	3.6
	Survival (%)	95	90.1	83.4
Complex 3x/4x FEVAR	Patients at risk	69	44	26
	Standard Error (%)	2.4	3.5	3.5
	Survival (%)	94	89.4	89.4

TV Patency



	Time (months)	12	24	36
Standard 2x FEVAR	Target vessels at risk	381	281	181
	Standard Error (%)	0.4	0.6	0.6
	Patency (%)	99.2	98.6	98.6
Complex 3x/4x FEVAR	Target vessels at risk	267	171	102
	Standard Error (%)	0.6	0.6	0.9
	Patency (%)	98.6	98.6	97.9

Freedom from reintervention



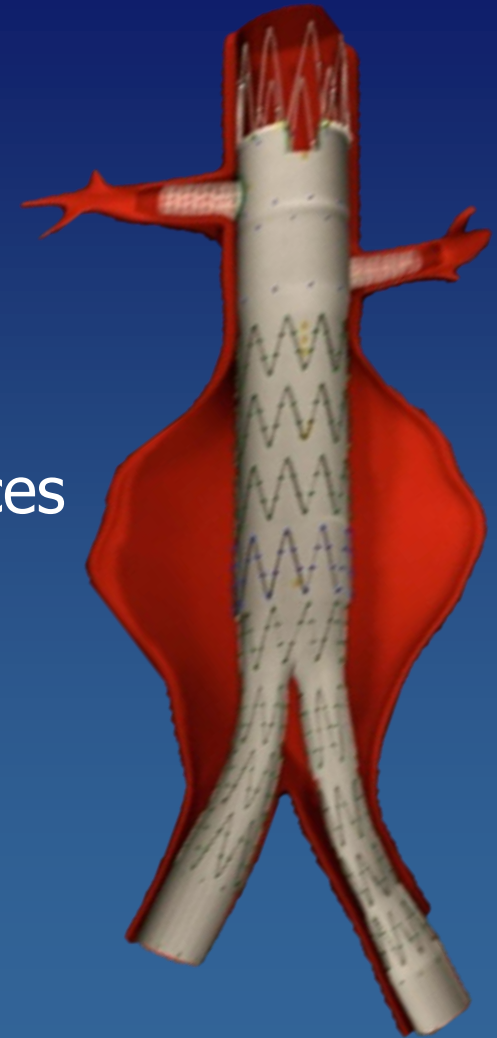
	Time (months)	12	24	36
Standard 2x FEVAR	Patients at risk	125	94	60
	Standard Error (%)	1.2	1.6	3.1
	Freedom from Reinterventions (%)	97.9	96.9	90.5
Complex 3x/4x FEVAR	Patients at risk	68	43	25
	Standard Error (%)	2.0	2.9	4.2
	Freedom from Reinterventions (%)	95.4	92.3	89.1

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So....

If we put all this together: FEVAR works

But the more complex the graft and the procedure becomes, you have more chances to fail or to have troubles.



Increased complexity of FEVAR equals increased complications

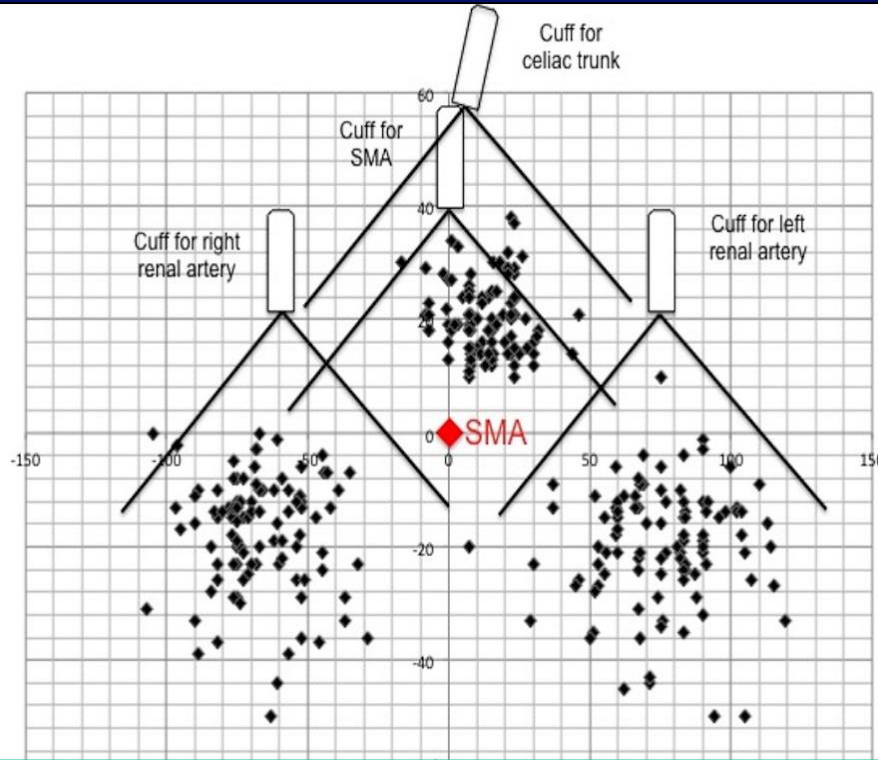
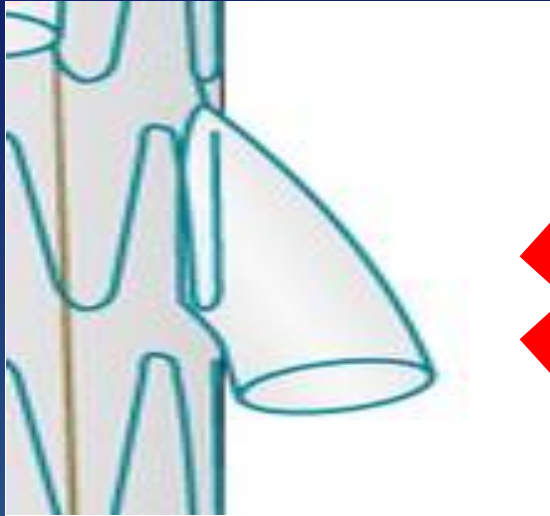
My way to go:

If I have to go for a sealing above the celiac trunc,
I like to use branches .



Increased complexity of FEVAR equals increased complications

Branches: F



**Münster
applicability**

63%

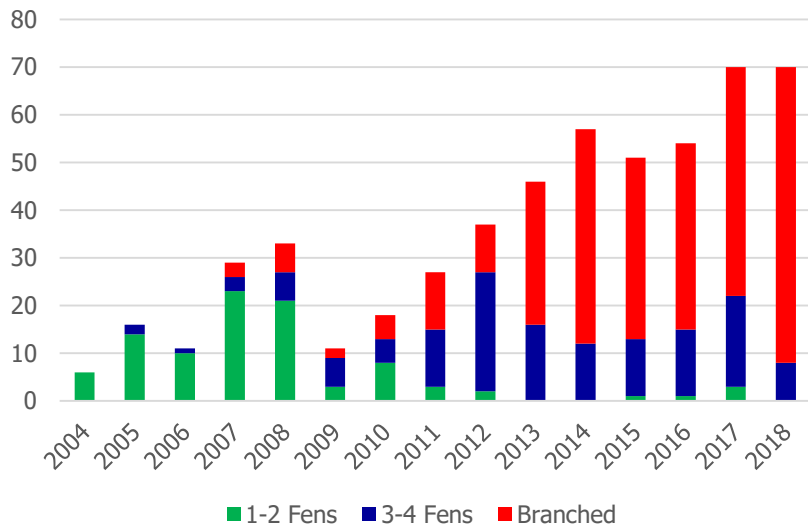
Bisdas et al. J Endovasc Ther 2013;20:672-77



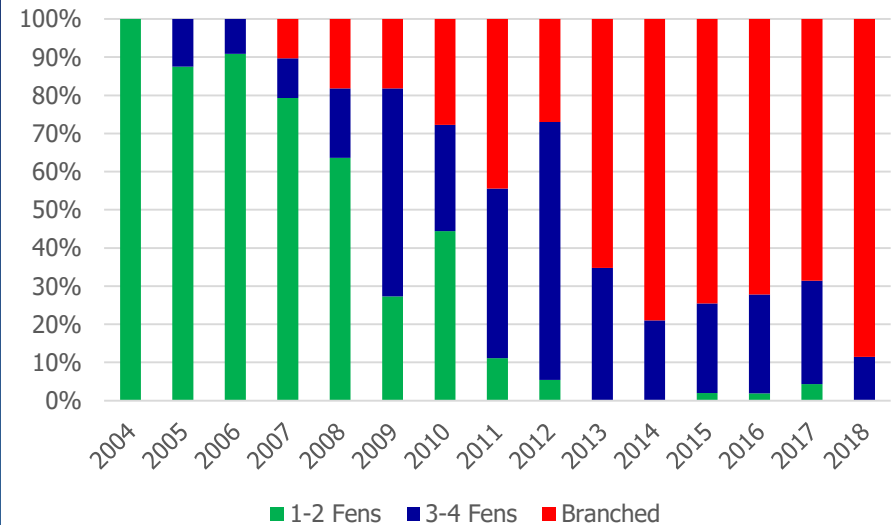
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Evolution of stentgraft configurations in Münster

FEVAR and BEVAR in Münster



FEVAR and BEVAR in Münster



N= 536 :

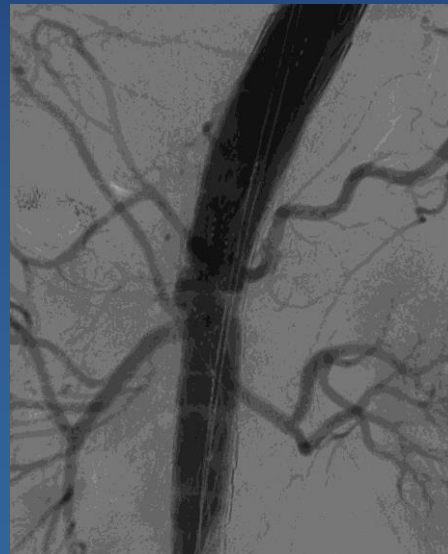
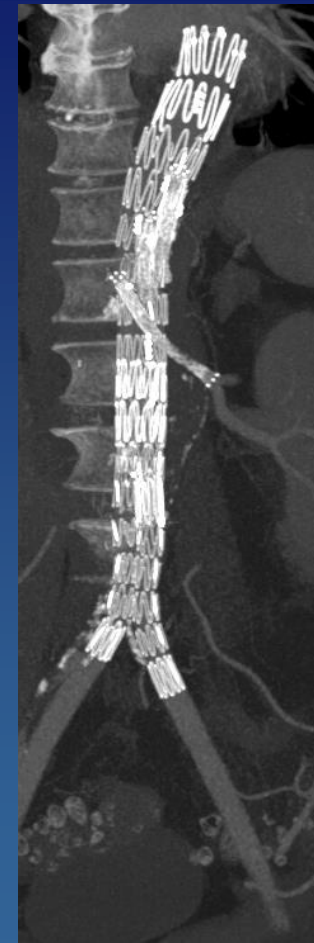
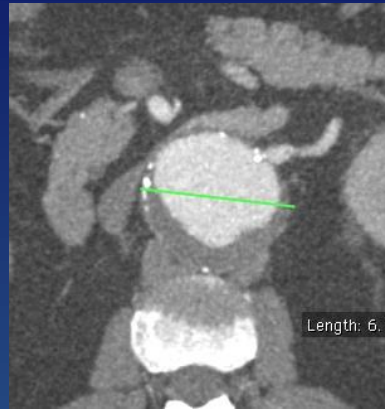
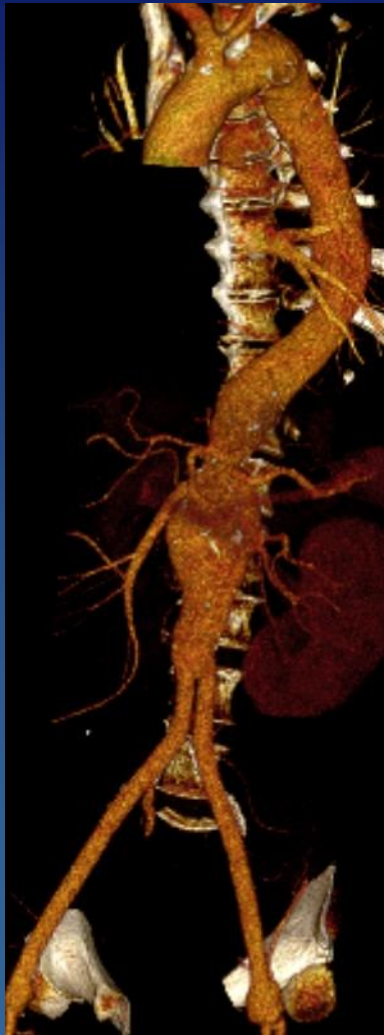
1-2 Fens: 95

3-4 Fens: 141

Branched: 300

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male, 61 Y, AFB , single left renal artery, 6 cm TAAA type 4



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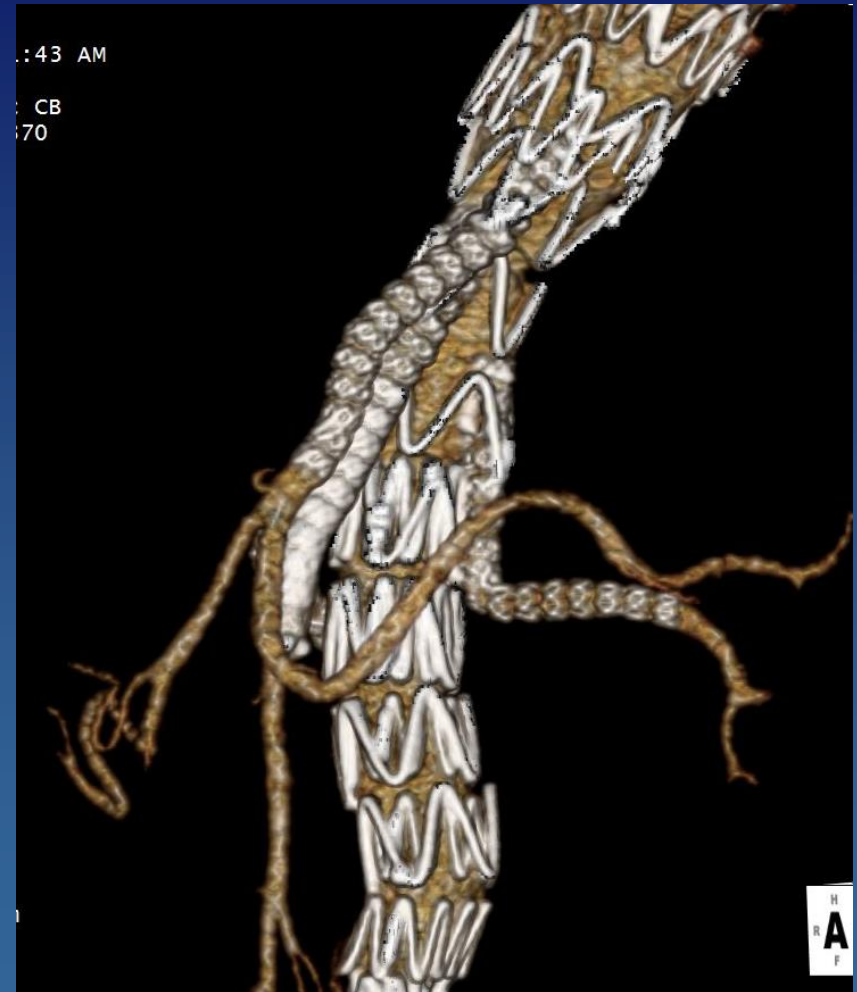
BEVAR needs flexible bridging stentgrafts



GORE® VIABAHN® VBX Balloon
Expandable Endoprosthesis

Increased complexity of FEVAR equals increased complications

Bridging the target vessels



Increased complexity of FEVAR equals increased complications

Summary:

Fenestrations - not forgiving

- suitable anatomie is needed
- The more fenestrations you have the more complications can occur.

Branches - more forgiving

- enough **space** is needed for the branches.
- **more coverage** of the thoracic aorta (SCI)

Flexibel bridging stentgrafts are needed for optimal long term results.

Plan your FEVAR or BEVAR as complex as necessary and try to keep it as simple as possible.

Balance is the key.

Increased complexity of FEVAR equals increased complications

Thank you for your attention !

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St. Franziskus Hospital Münster

