



PAU – Versorgung mit ballonexpandierbaren Stents **möglich und sinnvoll?**

24. Norddeutsche Gefäßtage

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Hamburg, 09.06.2017

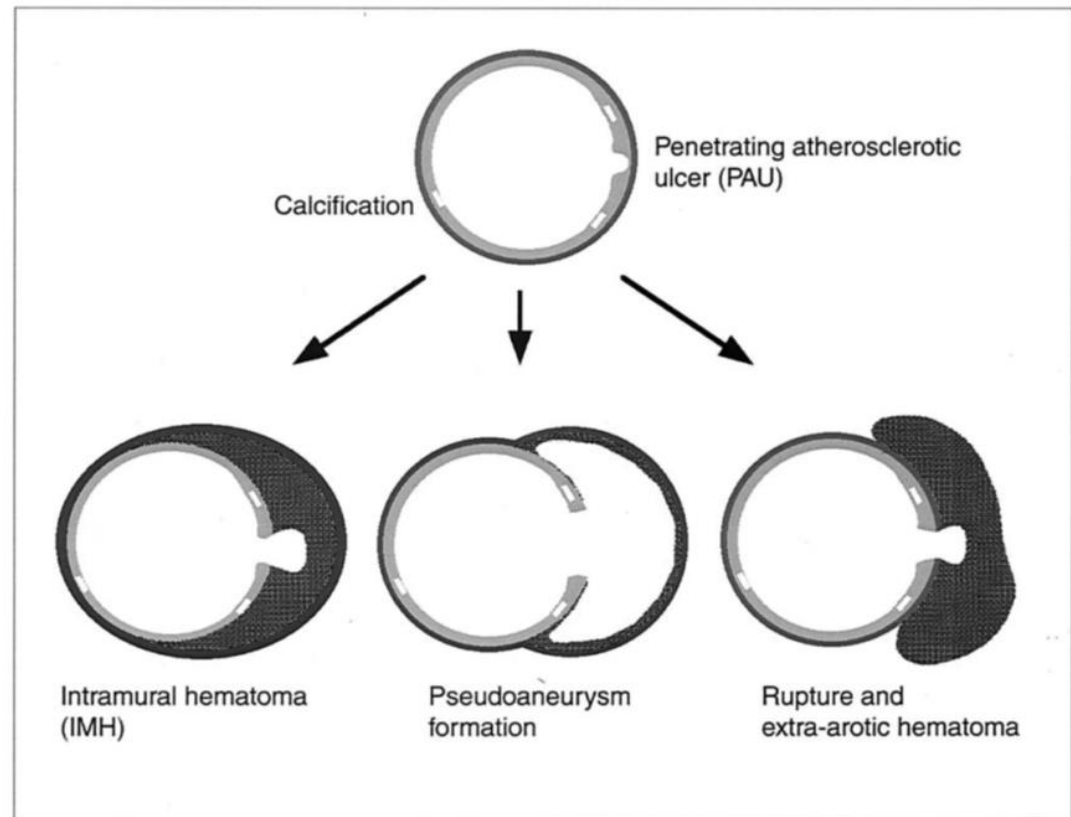
Keine Interessenskonflikte

Evangelisches Amalie
Sieveking-Krankenhaus

albertinen[†]

in besten Händen

- **Histopathologisch**: Ulceration eines arteriosklerotischen Plaques mit Penetration der Intima und Formierung eines Hämatoms in der Media u. Adventitia
- **Aktuell**: CT-Diagnose



- Seltene Entität, natürlicher Verlauf unklar
- häufiger in der thorakalen Aorta, seltener infrarenal
- Verantwortlich für 2-7 % aller akuten Aortensyndrome¹
- Einerseits berichtete Rupturraten von bis zu 38% bei klin. Symptomatik², andererseits benigner Verlauf mit geringer Expansion und Rupturrate³

¹Eggebrecht H, Eur J Vasc Endovasc Surg 2009;38:659-65

²Tittle SL, J Thorac Cardiovasc Surg 2002;123:1051-9.

³Quint LE, Radiology 2001;218:719-23.

PAU-penetrierendes Aortenulcus

Table I. Characteristics of patients with penetrating atherosclerotic ulcer disease

	<i>All PAU disease</i> (n = 388)	<i>Isolated PAU disease</i> (n = 224)	<i>PAUs with intramural hematoma</i> (n = 56)	<i>PAUs with saccular aneurysm</i> (n = 108)	P value
Age (years)	73.2 ± 8.9	73.5 ± 8.4	70.5 ± 10.6	73.8 ± 8.7	.047
Gender (male)	234 (60.2%)	143 (63.8%)	20 (35.1%)	71 (65.7%)	<.001
Hypertension	283 (78.2%)	150 (53.0%)	51 (89.5%)	82 (80.4%)	.034
Hyperlipidemia	161 (41.5%)	100 (44.6%)	13 (23.2%)	58 (53.7%)	.541
CAD	153 (39.4%)	93 (41.5%)	10 (17.9%)	40 (36.9%)	.161
Symptomatic	69 (17.8%)	41 (18.3%)	5 (8.9%)	21 (19.4%)	<.001

13% operiert

CAD, Coronary artery disease;

Table II. Location of penetrating atherosclerotic ulcer disease

	<i>All PAU disease</i> (n = 388)	<i>Isolated PAU disease</i> (n = 224)	<i>PAUs with intramural hematoma</i> (n = 56)	<i>PAUs with saccular aneurysm</i> (n = 108)
Location ^a				
Aortic arch	28 (7.2%)	15 (6.7%)	3 (5.4%)	10 (9.3%)
Descending thoracic aorta	240 (61.9%)	124 (55.6%)	50 (89.3%)	66 (61.1%)
Abdominal aorta	120 (30.9%)	85 (37.7%)	3 (5.4%)	32 (29.6%)

PAU, Penetrating atherosclerotic ulcer

Nathan D P, J Vasc Surg 2012;55:10-5.

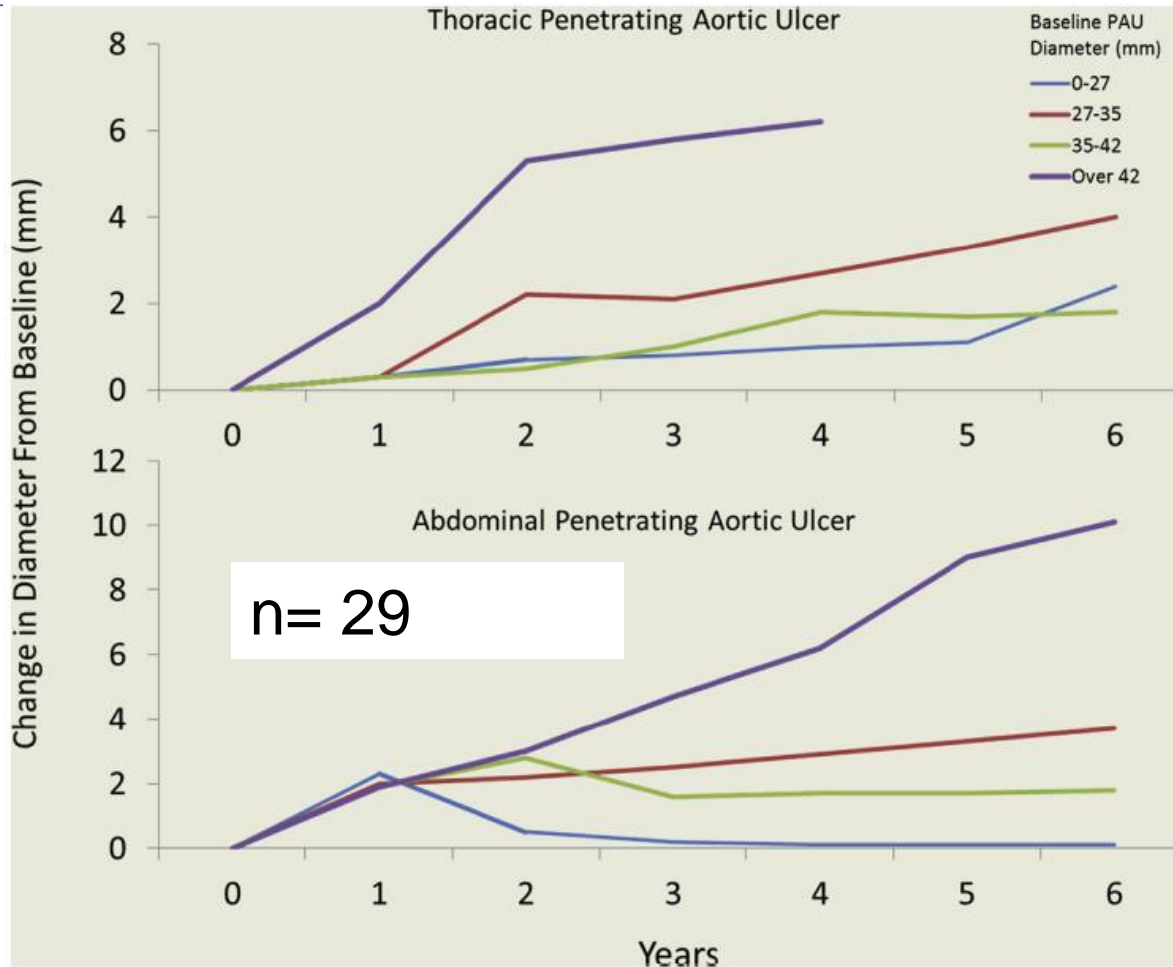
Table III. Predictors of disease progression of penetrating atherosclerotic ulcers by serial computed tomography angiography

	<i>PAUs that progressed (n = 20)</i>	<i>PAUs that did not progress (n = 67)</i>	<i>P value</i>
Age (years)	71.7 ± 6.7	71.2 ± 8.8	.828
Thoracic aortic location	12 (60.0%)	42 (62.7%)	.510
Total aortic diameter (mm)	32.8 ± 12.0	31.3 ± 7.1	.599
PAU neck (mm) ^a	12.3 ± 7.0	12.9 ± 6.5	.775
PAU depth (mm) ^a	5.9 ± 3.3	7.3 ± 4.3	.230
Through intimal calcification	12 (60.0%)	28 (41.8%)	.239
Male gender	11 (55.0%)	37 (55.2%)	.999
Coronary artery disease	7 (35.0%)	19 (30.6%)	.930
Hypertension	17 (85.0%)	45 (72.6%)	.409
<u>Symptomatic</u>	<u>9 (45.0%)</u>	<u>12 (17.9%)</u>	<u>.029</u>

^aOnly assessed for isolated penetrating atherosclerotic ulcers (PAUs) and PAUs with intramural hematoma.

Nathan D P, J Vasc Surg 2012;55:10-5.

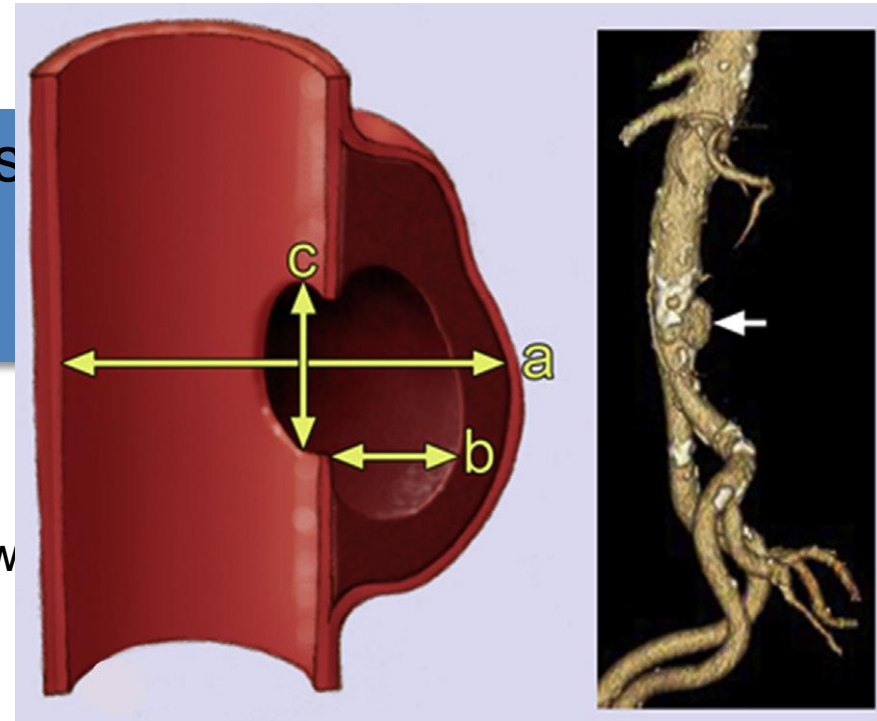
PAU-penetrierendes Aortenulcus



Gifford et al. J Vasc Surg 2016;63:1182-8.

Indikation zur Versorgung eines asymptotischen PAU ist unklar

- Zunahme des Aortendurchmessers
- PAU-Größe (20 mm Durchmesser bzw. 10 mm Halslänge)
- sacculäres Aneurysma



Ulcer measurement: a corresponds to maximal aortic diameter at ulcer site, b to depth of ulcer, and c to length of intimal defect at ulcer site.

- Studien

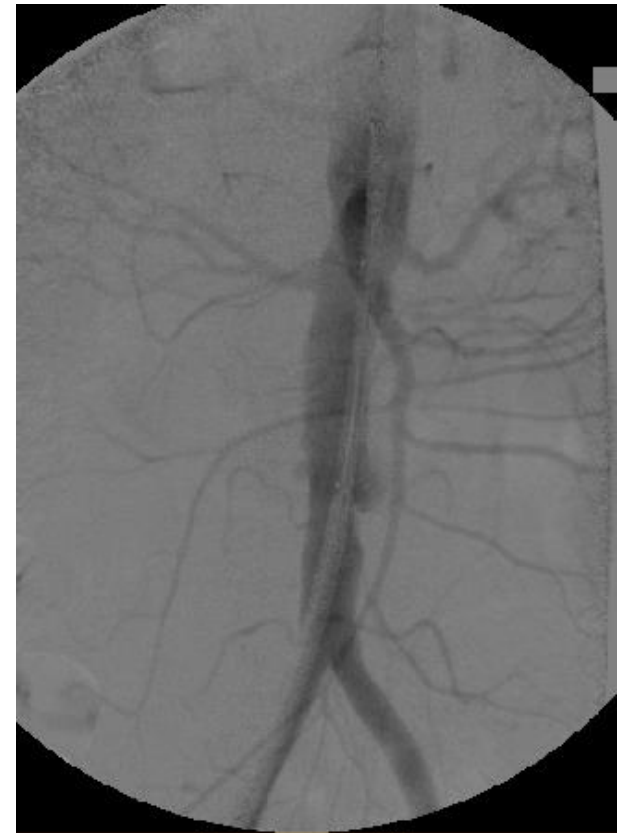
Fallserien mit bis zu 20 Pat. ¹

- 10% Mortalitätsrate
- 20% Endoleaks
- Hohe Komorbidität

EVAR

¹Hyhlik-Dürr A, J Endovasc Ther. 2010 Aug;17(4):510-4

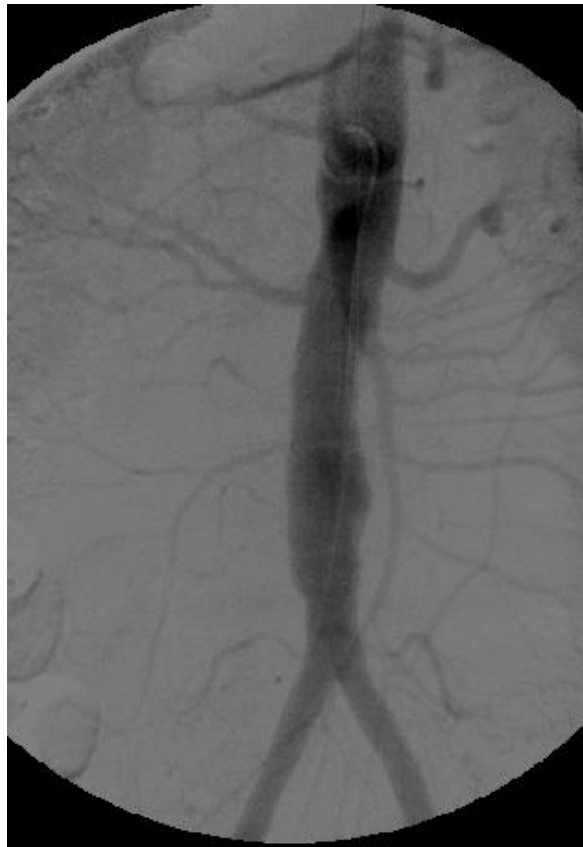
Fall 1



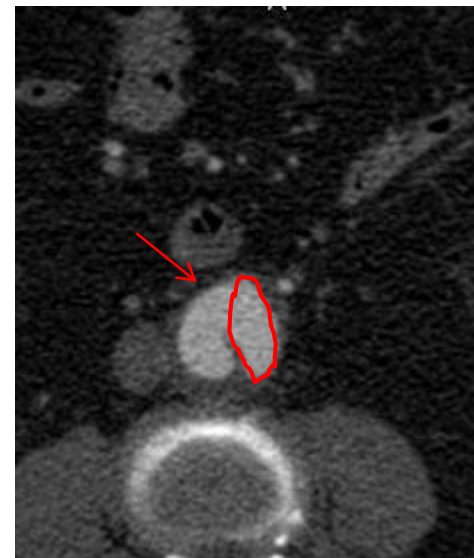
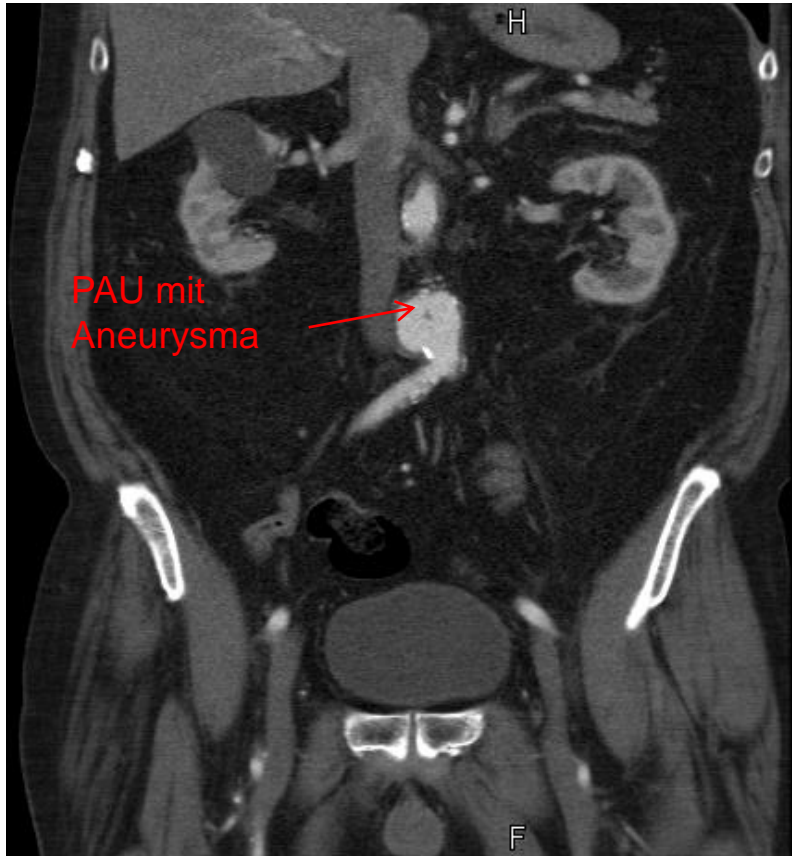
Fall1



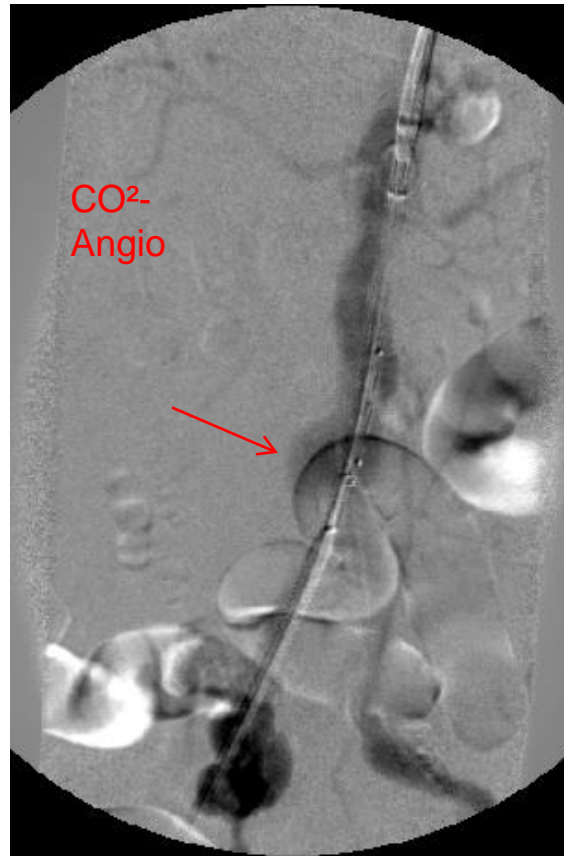
Fall1



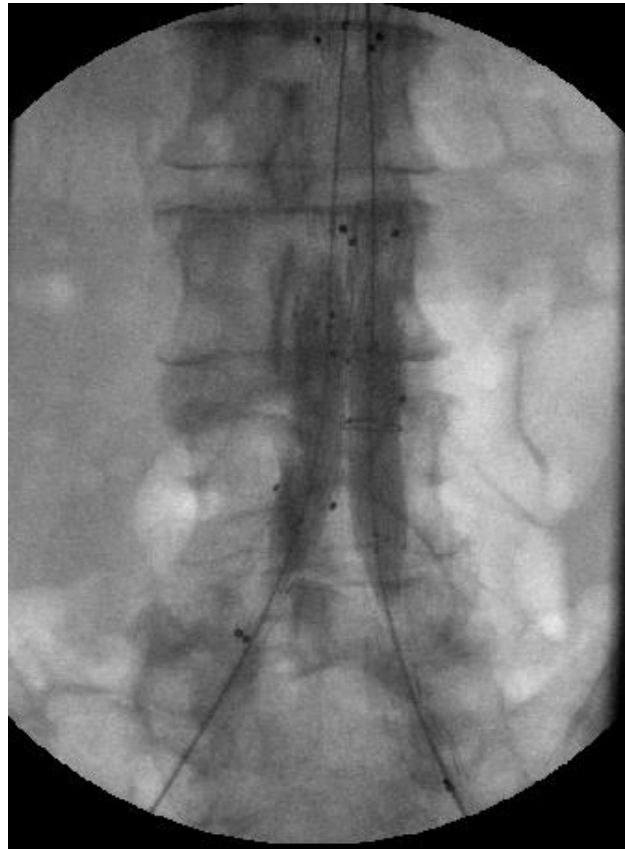
Fall 2



Fall 2



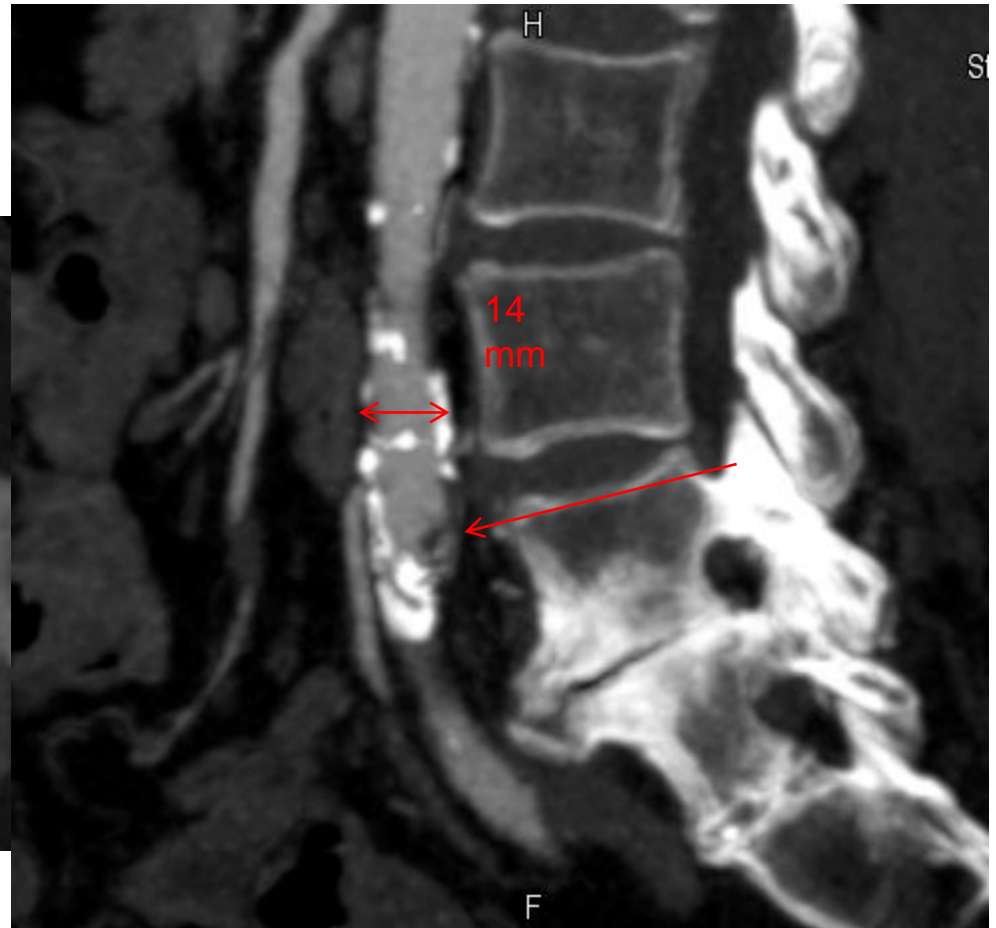
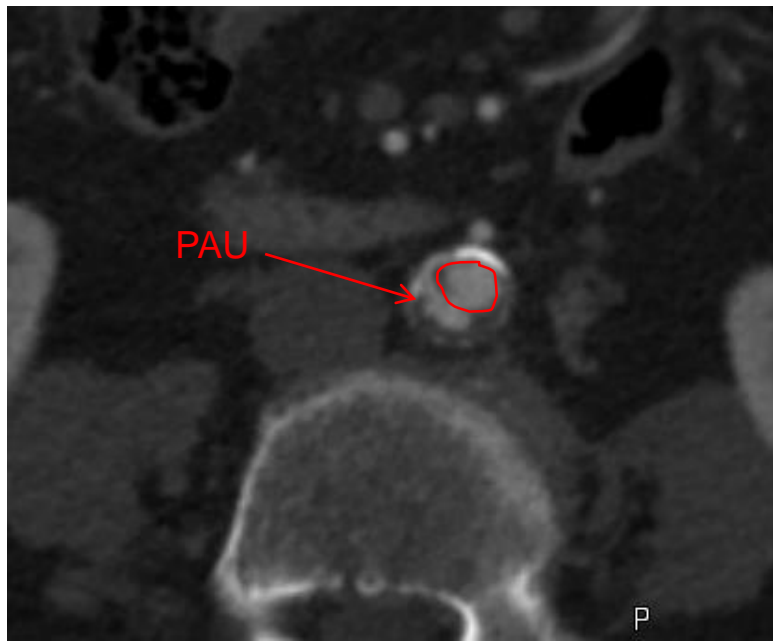
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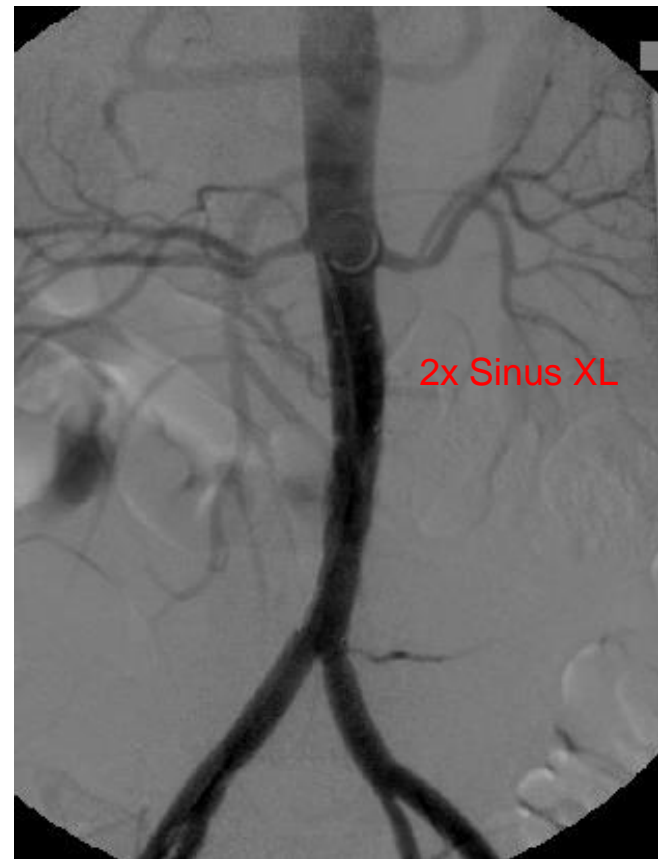
24. Norddeutsche Gefäßtage



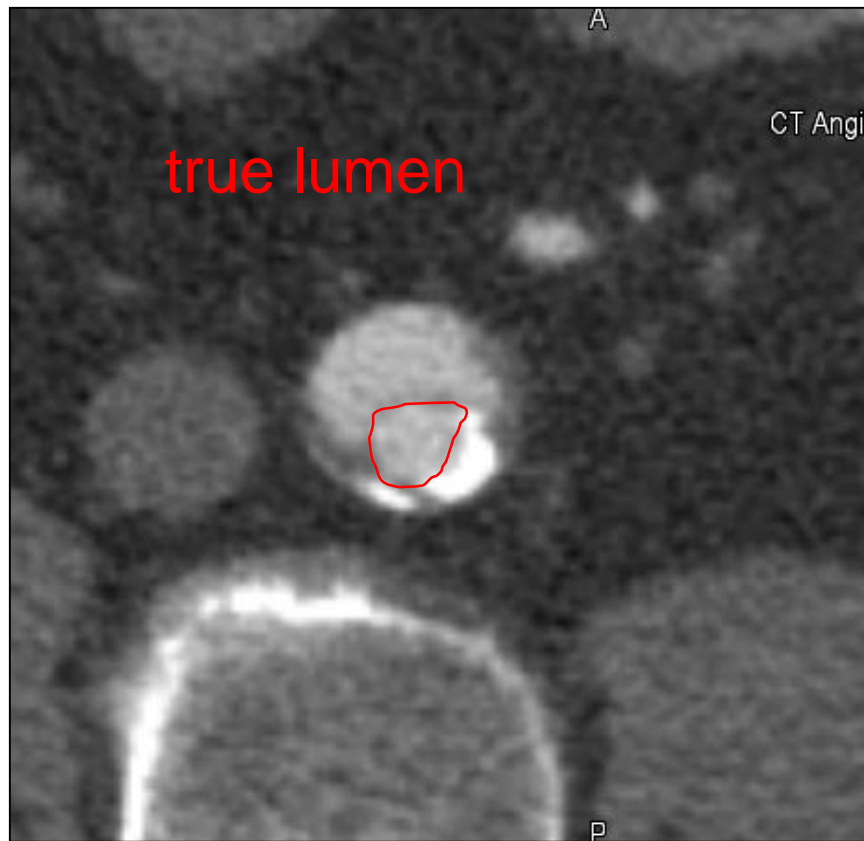
Fall 3



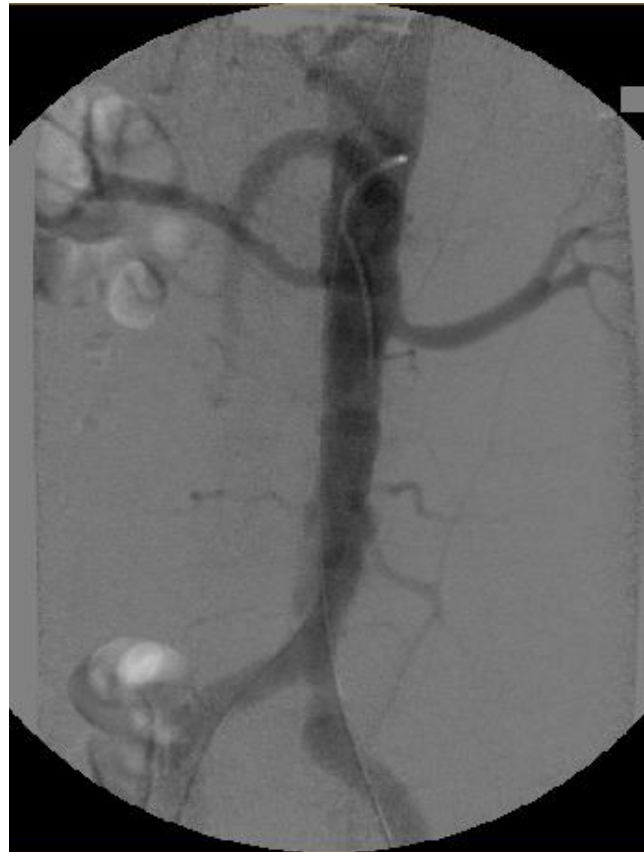
Fall 3



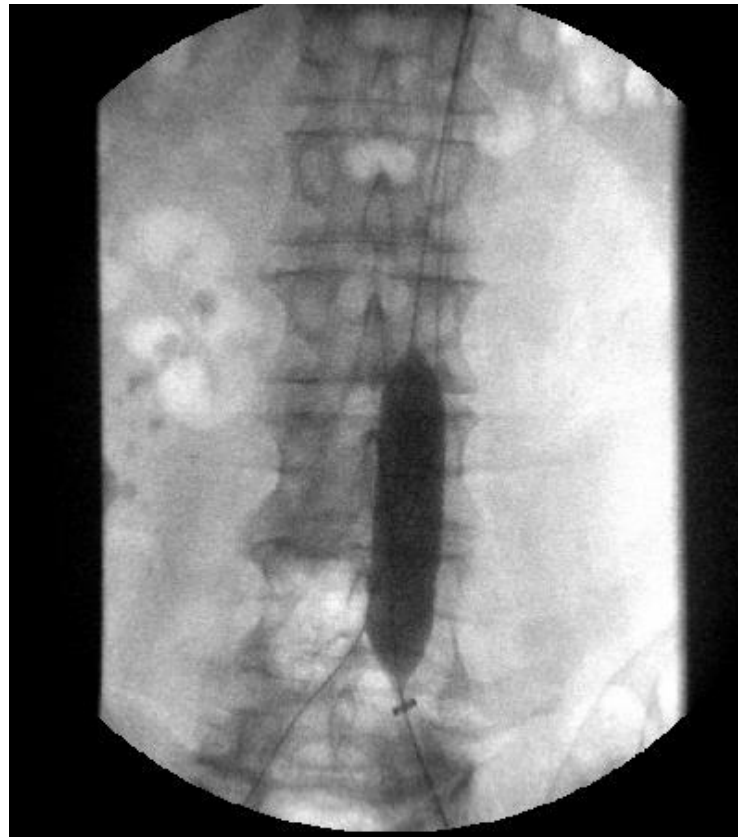
Fall 4



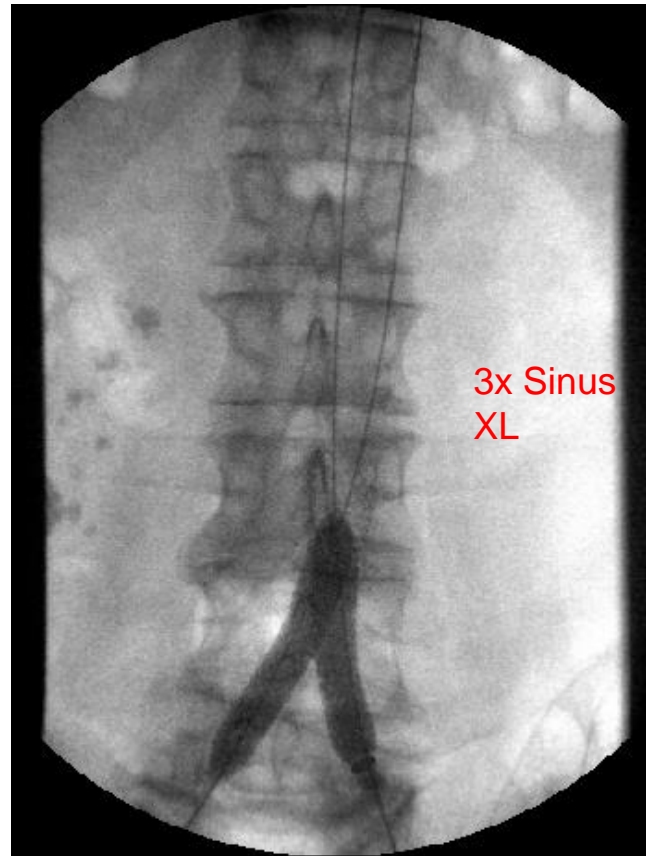
Fall 4



Fall 4



Fall 4



Fall 4





Product Information

For detailed information regarding approved diameters and lengths per indication please refer to the IFU (401472-001)

Labelled Stent Graft Size		REF		Introducer	NP [bar]	RBP [bar]	Ø at RBP [mm]	Expanded Stent Graft Length (mm)								Min. Required Inflation Volume [mL]		
Ø [mm]	Length [mm]	Usable Length [cm]						After Post-Dilation** (±2 mm)										
		75	120					Ø 14	Ø 16	Ø 18	Ø 20	Ø 22	Ø 24	Ø 26	Ø 30			
12	19	BGA1912_1	BGA1912_2					18	17	15	14	12						
12	29	BGA2912_1	BGA2912_2					27	25	23	22	20						
12	39	BGA3912_1	BGA3912_2	9 F	7	10	12.6	37	35	32	31	29						20
12	49	BGA4912_1	BGA4912_2					47	44	41	39	38						
12	59	BGA5912_1	BGA5912_2					58	53	50	47	49						
14	19	BGA1914_1	BGA1914_2					17		14	13	12						
14	29	BGA2914_1	BGA2914_2					27		22	21	19						
14	39	BGA3914_1	BGA3914_2	11 F	7	10	14.8	36		31	30	28						20
14	49	BGA4914_1	BGA4914_2					45		40	38	37						
14	59	BGA5914_1	BGA5914_2					54		49	48	47						
16	19	BGA1916_1	BGA1916_2					17			15	14	14	12				
16	29	BGA2916_1	BGA2916_2					25			24	23	22	20				
16	38	BGA3816_1	BGA3816_2	11 F	6	9	17.1	34			32	31	28	25				
16	48	BGA4816_1	BGA4816_2					44			41	40	37	34				
16	58	BGA5816_1	BGA5816_2					55			50	49	45	42				
18	29	-	BGA2918_2					24				22	21	18				
18	38	-	BGA3818_2	14 F	6	8	18.8	32				31	30	25				
18	48	-	BGA4818_2					41				39	37	33				
20	27	-	BGA2720_2					24					23	21	20	18		
20	37	-	BGA3720_2	14 F	4	6	21.6	33					32	30	29	27		
20	48	-	BGA4820_2					43					42	40	40	39		
22	37	-	BGA3722_2					33						30	28	28		
22	48	-	BGA4822_2	14 F	4	6	23.5	42						38	38	38		>30
24	37	-	BGA3724_2					29							28	28		>30
24	48	-	BGA4824_2	14 F	5	6	25.0	40							37	37		>40

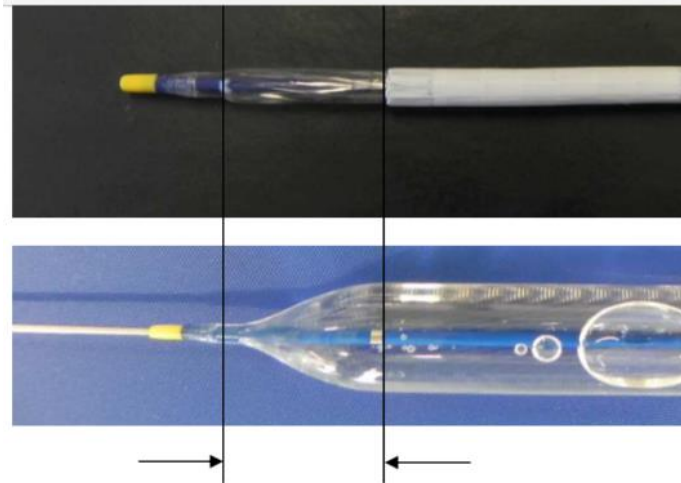
* Stent graft length after inflation with nominal pressure (NP)

** Numbers stated are approximate values. Expanded stent graft length after post-dilation depends on type, material and length of post-dilation balloons used.

All data on file.

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BeGraft
aortic



Definition Schulterlänge: von Anfang Ballonschulter (ohne Spitze) bis

Ø12: ~14mm

Ø14: ~16mm

Ø16: ~18mm

Ø18: ~20mm

Ø20: ~22mm

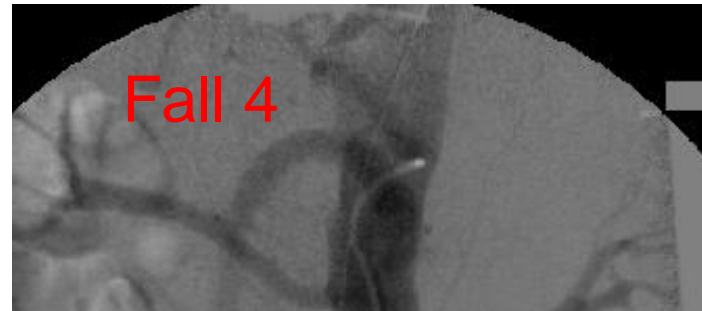
Ø22: ~24mm

Ø24: ~25mm

Ex post

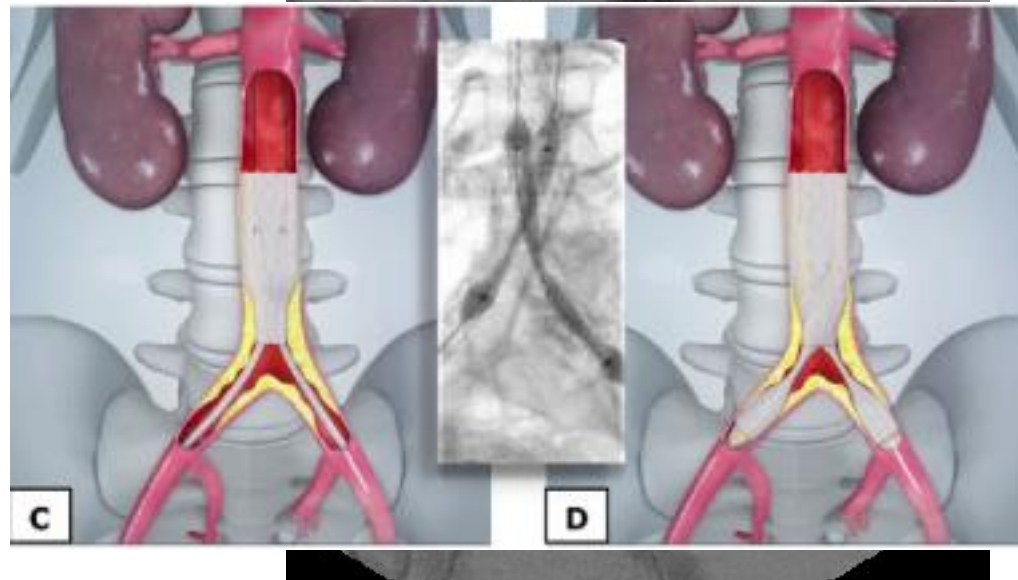
BeGraft
möglich,
ggf. besser





BeGraft
(CERAB)

ggf. besser?



Fazit

- **Vorteile**

gleichzeitige Behandlung zugrunde liegender Stenosen

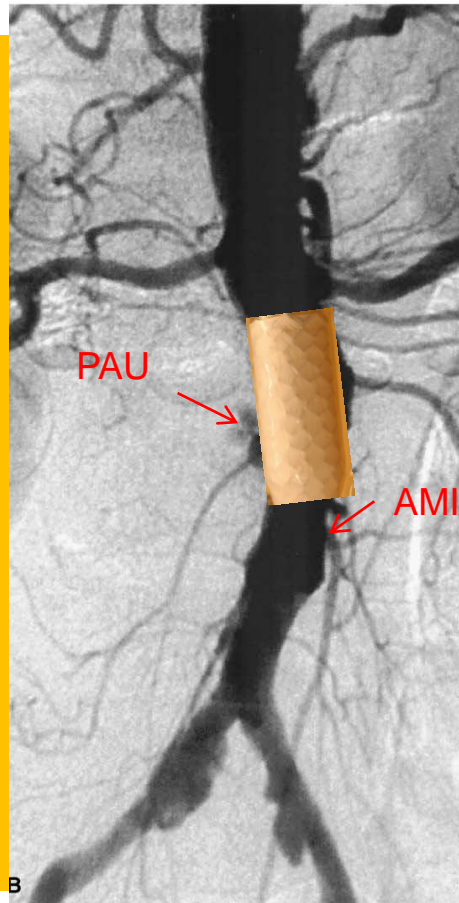
Variabilität bei den Graft-Abmessungen

„low profile“

exakte Platzierbarkeit, damit mglw. Schonung von Gefäßabgängen

Fazit

- **Vorteile**



Fazit

- **Nachteile**

lange Ballonschulter

leicht ablösbar

**unzureichende Abdichtung bei aortobiilakaler
Versorgung („gutters“)**

Fazit

- **Nachteile**



Bilder mit freundlicher Genehmigung von P. Goverde

Vielen Dank!

