Cephalic Arch

Disclosure

Speaker name:

.Jeffrey Hull.....

I have the following potential conflicts of interest to report:

☒ Consulting

☐ Employment in industry

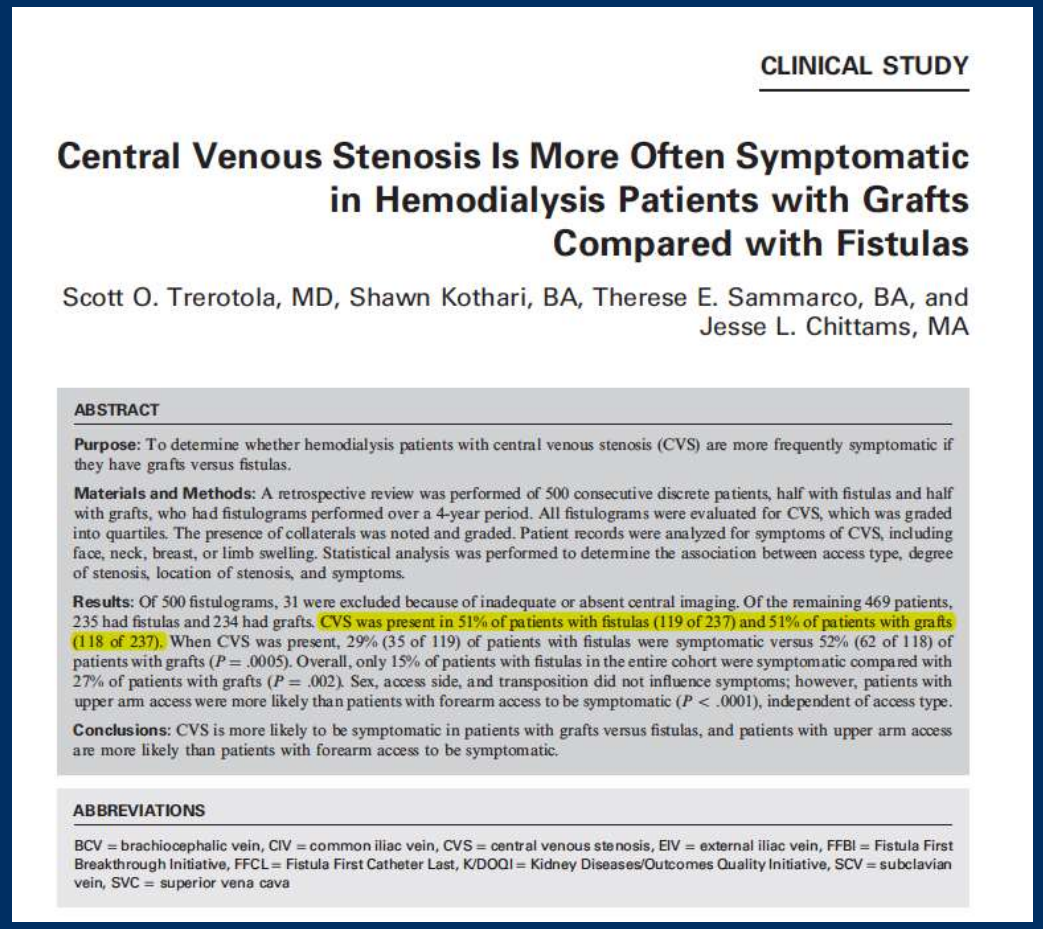
☐ Stockholder of a healthcare company

☐ Owner of a healthcare company

☐ Other(s)

☐ I do not have any potential conflict of interest

Central Venous Stenosis



CLINICAL STUDY

Central Venous Stenosis Is More Often Symptomatic in Hemodialysis Patients with Grafts Compared with Fistulas

Scott O. Trerotola, MD, Shawn Kothari, BA, Therese E. Sammarco, BA, and Jesse L. Chittams, MA

ABSTRACT

Purpose: To determine whether hemodialysis patients with central venous stenosis (CVS) are more frequently symptomatic if they have grafts versus fistulas.

Materials and Methods: A retrospective review was performed of 500 consecutive discrete patients, half with fistulas and half with grafts, who had fistulograms performed over a 4-year period. All fistulograms were evaluated for CVS, which was graded into quartiles. The presence of collaterals was noted and graded. Patient records were analyzed for symptoms of CVS, including face, neck, breast, or limb swelling. Statistical analysis was performed to determine the association between access type, degree of stenosis, location of stenosis, and symptoms.

Results: Of 500 fistulograms, 31 were excluded because of inadequate or absent central imaging. Of the remaining 469 patients, 235 had fistulas and 234 had grafts. CVS was present in 51% of patients with fistulas (119 of 237) and 51% of patients with grafts (118 of 237). When CVS was present, 29% (35 of 119) of patients with fistulas were symptomatic versus 52% (62 of 118) of patients with grafts ($P = .0005$). Overall, only 15% of patients with fistulas in the entire cohort were symptomatic compared with 27% of patients with grafts ($P = .002$). Sex, access side, and transposition did not influence symptoms; however, patients with upper arm access were more likely than patients with forearm access to be symptomatic ($P < .0001$), independent of access type.

Conclusions: CVS is more likely to be symptomatic in patients with grafts versus fistulas, and patients with upper arm access are more likely than patients with forearm access to be symptomatic.

ABBREVIATIONS

BCV = brachiocephalic vein, CIV = common iliac vein, CVS = central venous stenosis, EIV = external iliac vein, FFBI = Fistula First Breakthrough Initiative, FFCL = Fistula First Catheter Last, K/DOQI = Kidney Diseases/Outcomes Quality Initiative, SCV = subclavian vein, SVC = superior vena cava

- CVS present in 51% of AVF and AVG patients
- 19.4% (97/500) Symptomatic
- Relationship between Symptoms and Collaterals
- Grading system 0-3 based on size, density and number

Trerotola, S. O., et al. (2015). "Central venous stenosis is more often symptomatic in hemodialysis patients with grafts compared with fistulas." J Vasc Interv Radiol **26**(2): 240-246.

Cephalic Arch

J Vasc Access 2014; 15 (3): 157-162
DOI: 10.5301/jva.5000203

REVIEW

Cephalic arch stenosis in dialysis patients: review of clinical relevance, anatomy, current theories on etiology and management

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ABSTRACT

Arteriovenous hemodialysis fistulas (AVFs) serve as a lifeline for many individuals with end-stage renal failure. A common cause of AVF failure is cephalic arch stenosis. Its high prevalence compounded with its resistance to treatment makes cephalic arch stenosis important to understand. Proposed etiologies include altered flow in a fistulized cephalic vein, external compression by fascia, the unique morphology of the cephalic arch, large number of valves in the cephalic outflow tract and biochemical changes that accompany renal failure. Management options are also in debate and include angioplasty, cutting balloon angioplasty, bare metal stents, stent grafts and surgical techniques including flow reduction with minimally invasive banding as well as more invasive venovenostomy with transposition surgeries for refractory cases. In this review, the evidence for the clinical relevance of cephalic arch stenosis, its etiology and management are summarized.

Key words: Angioplasty, Cephalic arch, Dialysis, Fistula

Accepted: October 26, 2013

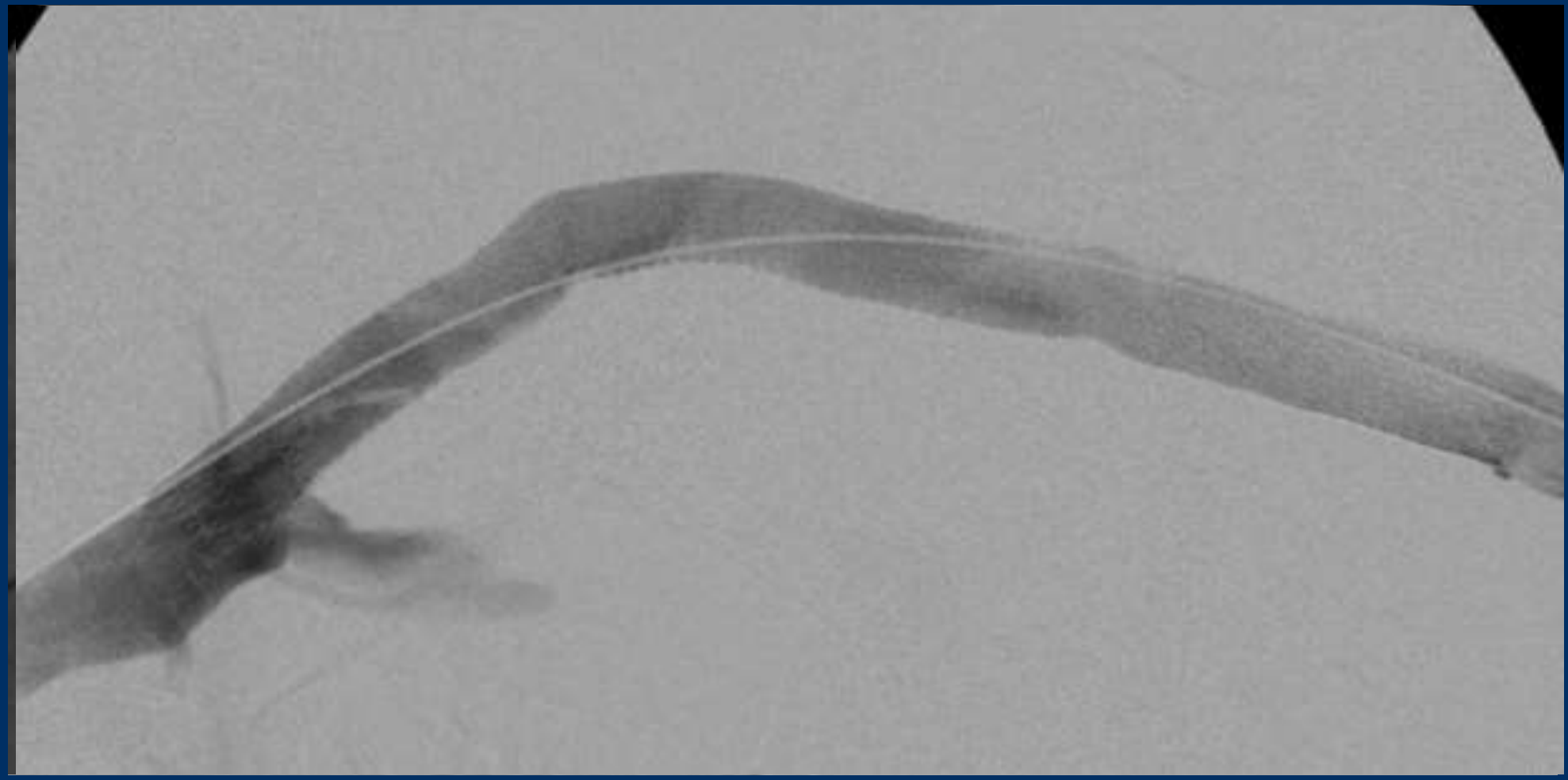
- Deltopectoral fascia
- Calviculopectoral fascia
- External restriction results in increased pressure and turbulance

Sivananthan, G., et al. (2014). "Cephalic arch stenosis in dialysis patients: review of clinical relevance, anatomy, current theories on etiology and management." J Vasc Access **15**(3): 157-162.

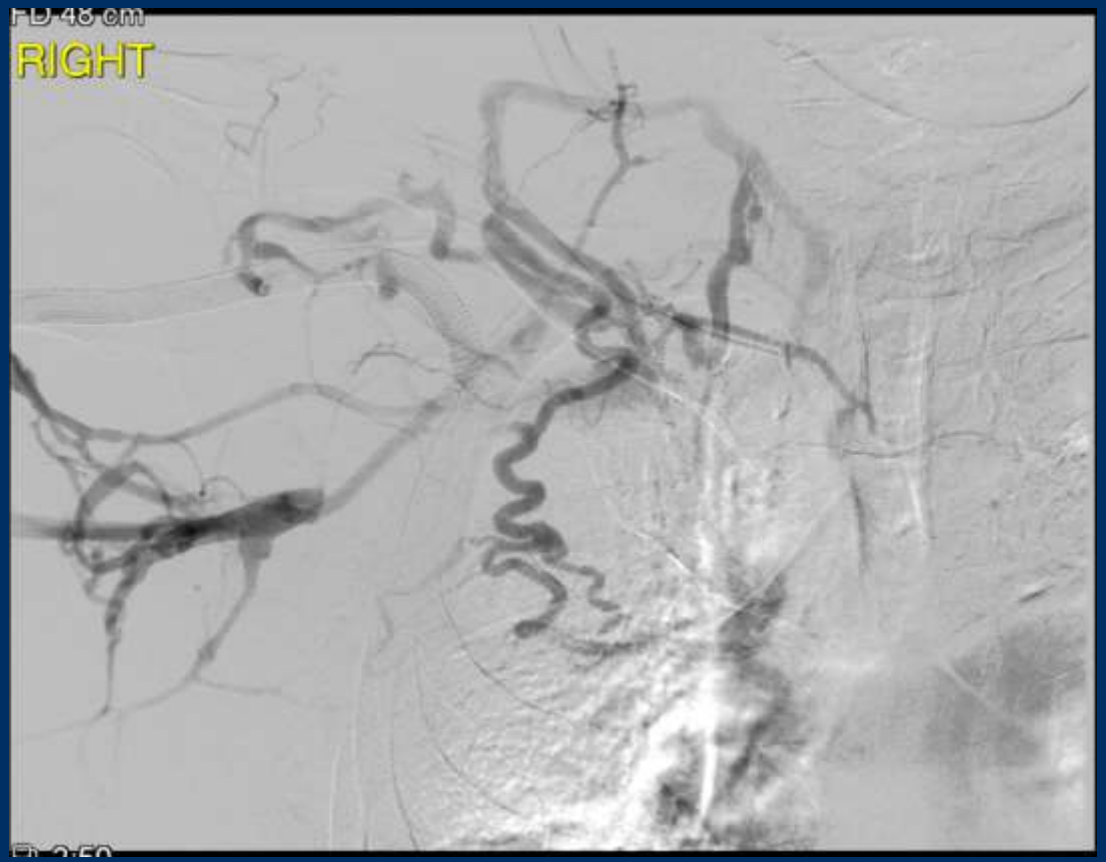
Ellipsys Fistula 5-10-16

Prolonged bleeding 10-26-17

Low flow 6-25-20



Edge Stent Subclavian Vein Occlusion



DCB in AV Access: Put in Context

Comparison of Primary Patency of Different Treatment Strategies

	Covered Stents						DCB					BMS	
Author	**Kitrou [1]**	**Falk [2]**	**Vesely [3]**	**Dolmatch [4,5]**	**Haskal [6]**	**Yang [7]**	**Katsanos [8,9]**	**Lucev [10]**	**Maleux [11]**	**Trerotola [12, 13]**	**Lookstein [14, 15]**	**Hoffer [16]**	**Shemesh [17]**
Study Device	Covera	Fluency Plus	Viabahn	Covera	Flair	N/R	IN.PACT	IN.PACT	IN.PACT	Lutonix 035	IN.PACT AV	Wallstent	Luminex BMS Fluency Plus
Design	Retrospective single center	Prospective RCT	Prospective RCT	Prospective RCT	Prospective RCT	Prospective RCT	Prospective RCT	Prospective RCT	Prospective RCT	Prospective RCT	Prospective RCT	Prospective RCT	Prospective RCT
# Patients	64	275	293 (Graft:145, PTA:148)	280 (Graft:142, PTA:138)	190	98	40	62	64	285 (DCB:141, PTA:144)	330 (DCB:170, PTA:160)	34	25
Access Type	AVG	AVG/AVF (ISR)	AVG	AVF	AVG	AVG	AVF (14) and AVG (26)	AVF	AVF	AVF	AVF	AVG	
Endpoint	**Primary Patency**	**Access Circuit Patency**	**Primary Patency**	**Primary Patency**	**Primary Patency**	**Primary Patency**	**Primary Patency**	**Primary Patency**	**Primary Patency**	**Primary Patency**	**Primary Patency**	**Primary Patency**	**Primary Patency**
Results													
6-mo	73.60%	Graft: 18.6%	Graft: 51.6%	Graft: 78.7%	Graft: 51%	Graft: 83.2%	DCB: 70%	DCB:90.3%	DCB: 67%	DCB: 71.4%	DCB: 81.4%	Stent: 128 day	Graft: 82%
		PTA: 4.5% p<.001	PTA: 34.2% p=.006	PTA: 47.9% p<.001	PTA: 23% p<.001	PTA: 27.8%	PTA: 25% p<0.001	PTA:61.3%;p= 0.016	PTA: 65%;p=.76	PTA: 63% p=0.057	PTA: 59.0% p<0.001	PTA: 128 day	BMS: 39%
12-mo				Graft: 57.5%		Graft: 46.9%	DCB: 35%			DCB: 45%	DCB: 65.3%		Graft: 39%
				PTA: 21.2% p<.001		PTA: 7.8%	PTA: 5% p<0.001			PTA: 35% p= 0.045	PTA: 46.3% p<0.001		BMS: 0, p=0.0023
24-mo				Graft: 41.8%						DCB: 26.9%			
				PTA: 10.4% p<.001						PTA:24.4% p=0.087			

Endpoint definitions may vary between studies

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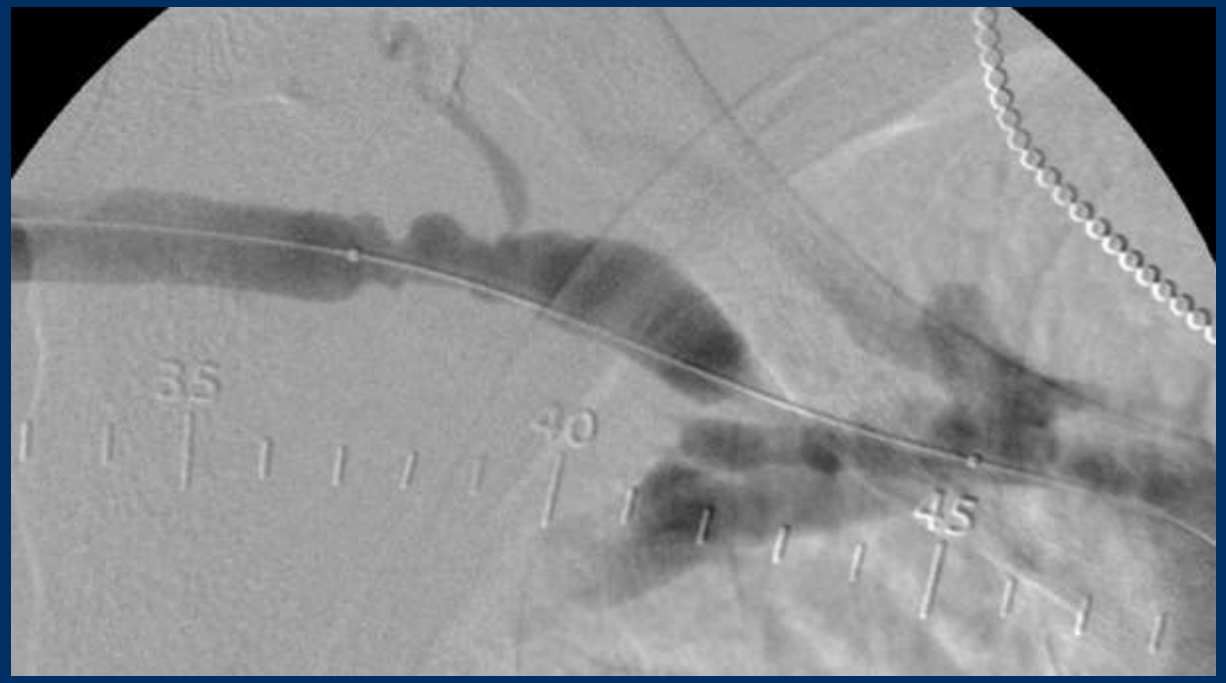
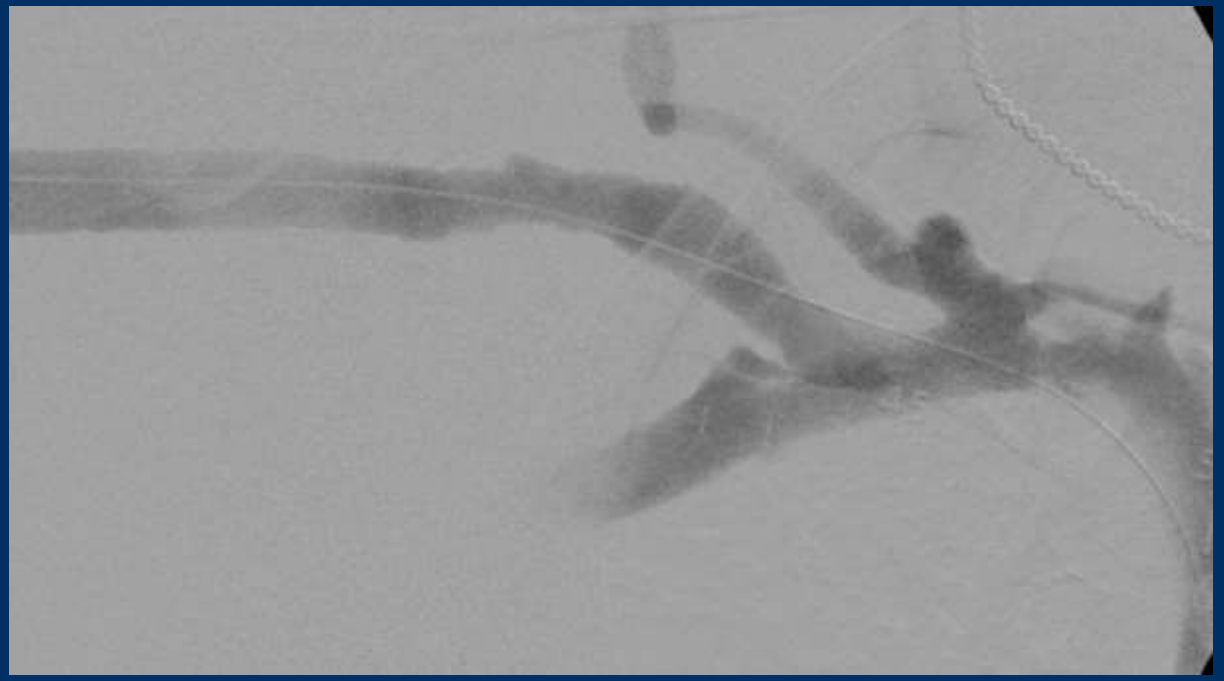
Brachiocephalic fistula

Prolonged bleeding

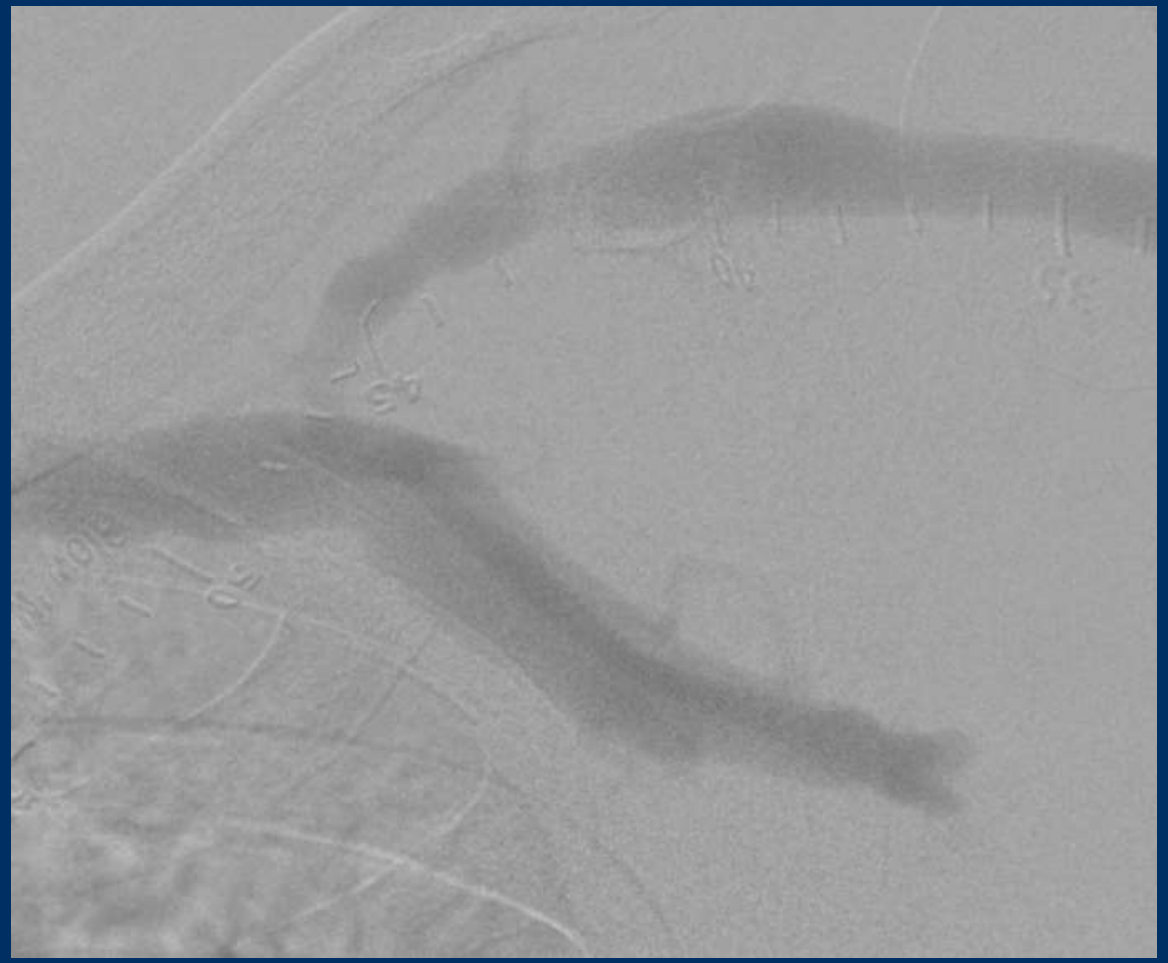


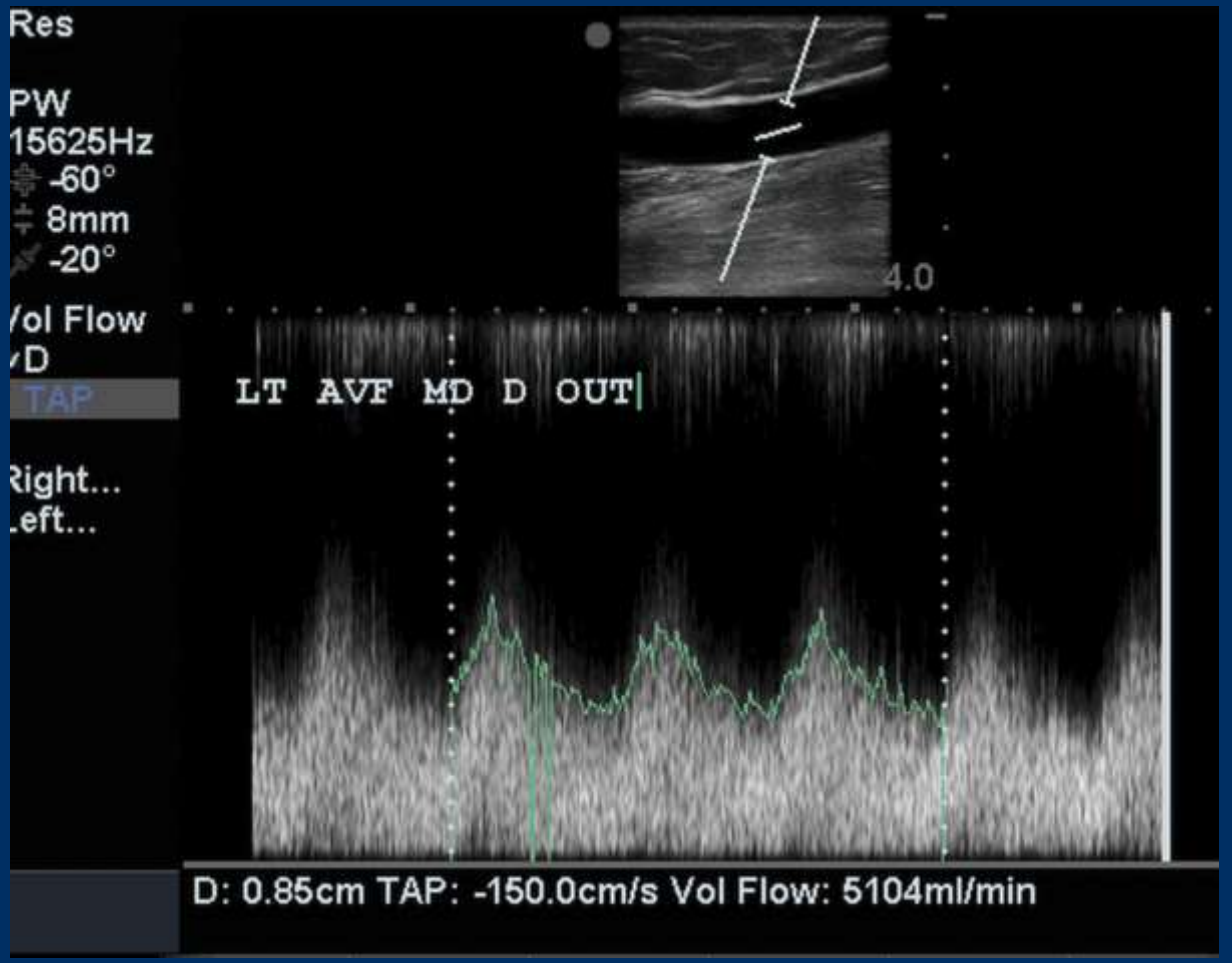


High bifurcation ulnarcephalic fistula

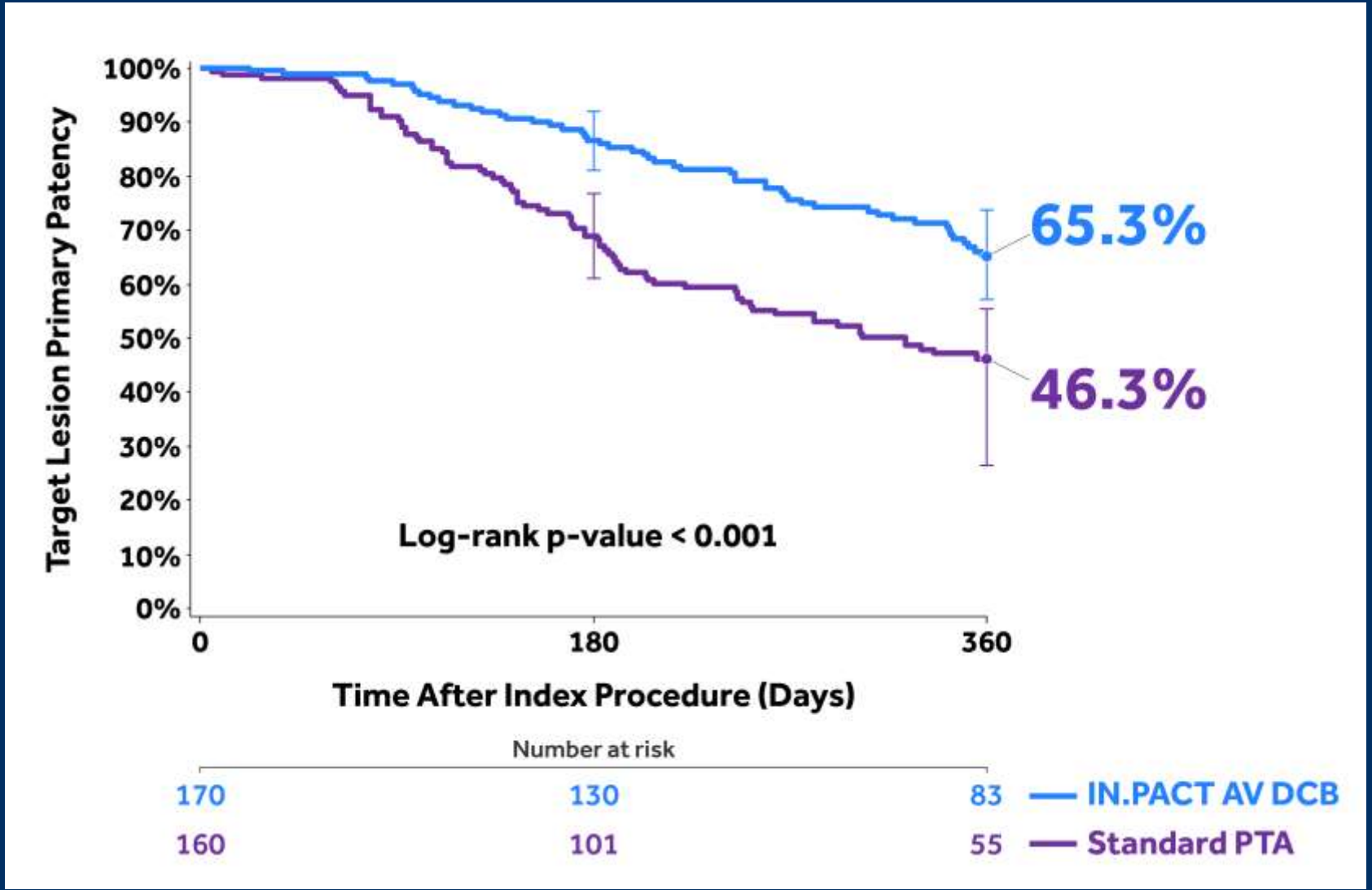
Prolonged bleeding

High flow, aneurysmal





Target Lesion Primary Patency Through 12 Months

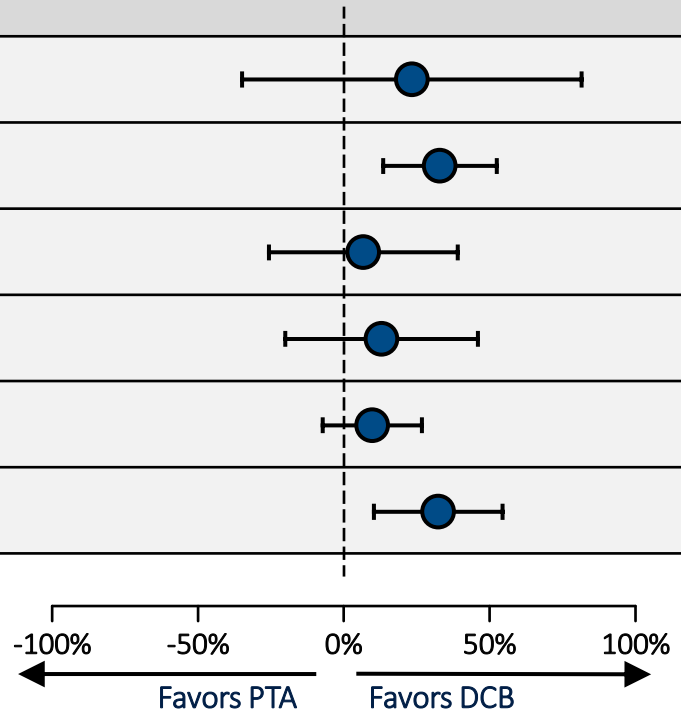


Holden A. LINC 2020; Leipzig, Germany.

Target Lesion Primary Patency Through 6 Months

DCB vs PTA by Lesion Location

Subgroup (N_{DCB}/N_{PTA})	IN.PACT AV DCB	Standard PTA	Difference [95% CI]
Target Lesion Location			
Arterial Inflow (4/7)	**75.0%** (3/4)	**50.0%** (3/6)	**25.0%** [-33.3%, 83.3%]
Anastomosis (44/40)	**84.6%** (33/39)	**50.0%** (19/38)	**34.6%** [15.1%, 54.1%]
Swing Point (14/12)	**83.3%** (10/12)	**75.0%** (9/12)	**8.3%** [-24.0%, 40.7%]
In Cannulation Zone (25/12)	**78.3%** (18/23)	**63.6%** (7/11)	**14.6%** [-18.4%, 47.7%]
Venous Outflow (53/53)	**81.6%** (40/49)	**70.2%** (33/47)	**11.4%** [-5.6%, 28.4%]
Cephalic Arch (30/36)	**84.0%** (21/25)	**50.0%** (17/34)	**34.0%** [11.9%, 56.1%]



Lookstein, R. VIVA 2020; Las Vegas, US.

IN.PACT AV DCB is approved in the USA and Canada for treatment, after appropriate vessel preparation, of obstructive lesions up to 100 mm in length in the native arteriovenous dialysis fistulae with reference vessel diameters of 4 to 12 mm. **Caution:** Federal law (USA) restricts this device to sale by or on the order of a physician.

Conclusion

- Common problem
- Cephalic Arch has unique features
- Historically POBA and Stent Grafts
- DEB making inpact