CONTROVERSES ET ACTUALITÉS EN CHIRURGIE VASCULAIRE

CONTROVERSIES & UPDATES IN VASCULAR SURGERY

FEBRUARY 7-9 2019

MARRIOTT RIVE GAUCHE & CONFERENCE CENTER

PARIS, FRANCE WWW.CACVS.ORG

Treatment of access-related distal ischemia: DRIL

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Disclosure

Speaker name: Miltos Lazarides

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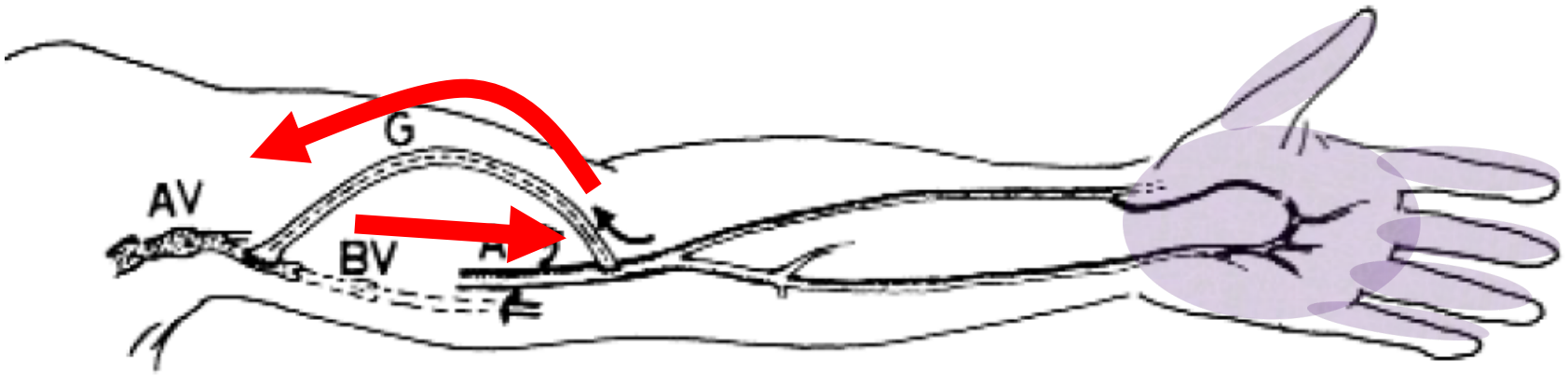
- ☐ I have the following potential conflicts of interest to report:
- ☐ Consulting
- ☐ Employment in industry
- ☐ Shareholder in a healthcare company
- ☐ Owner of a healthcare company
- ☐ Other(s)
- ■ I do not have any potential conflict of interest

Causes of ARDI:

1. inflow lesion
2. discordant vascular resistance



Steal severity classification

Stage*	Symptoms/signs	Management
I	Pale and/or cool hand without pain	Conservative
II	Pain during exercise and/or during dialysis	Mostly conservative
III	Rest pain or loss of motor function	Urgent surgical intervention
IV	Tissue loss (ulcers/gangrene)	Urgent surgical intervention

*Tordoir et al, Eur J Vasc Surg 2004

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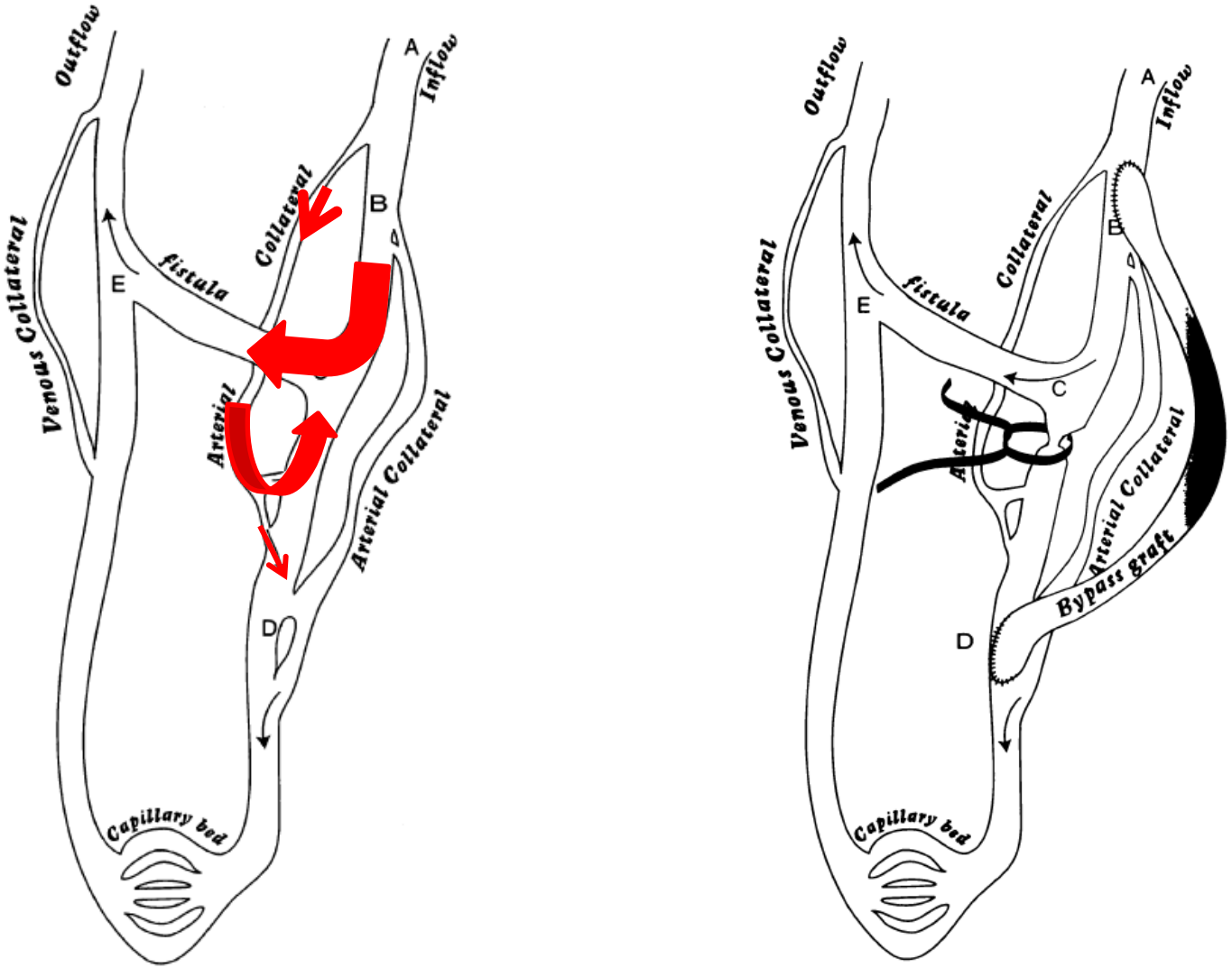
Stage IV

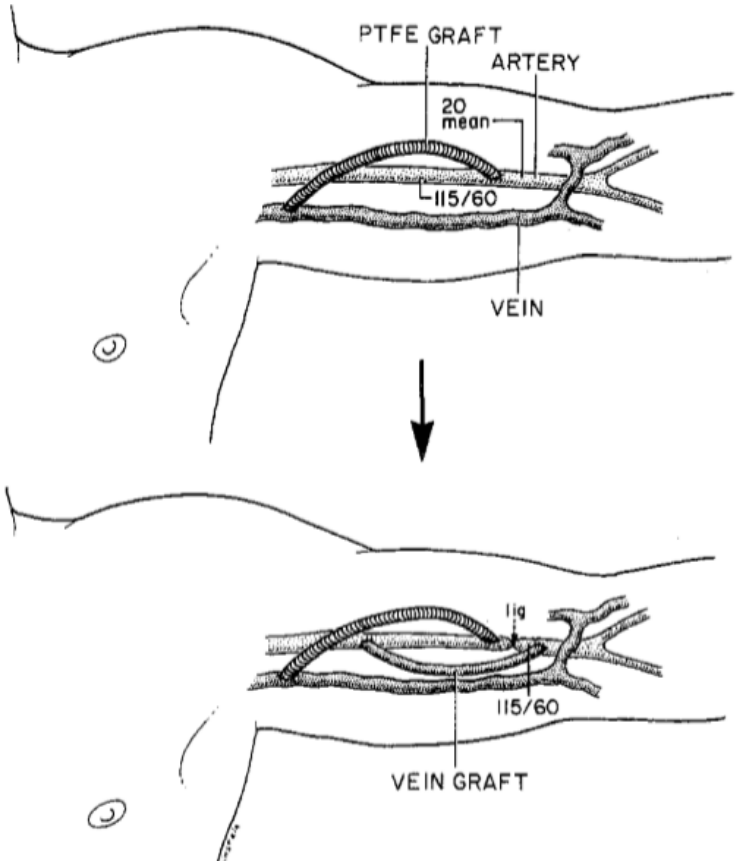
Distal Revascularization Interval Ligation



Wixon et al, J Am Coll Surg 2000

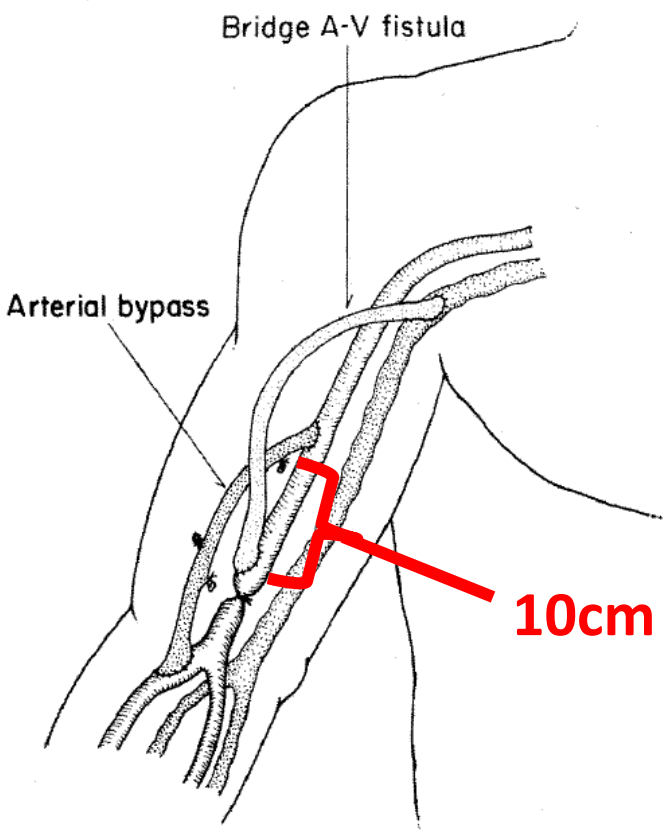
Treatment of ischemia due to "steal" by arteriovenous fistula with distal artery ligation and revascularization

Harry Schanzer, M.D., Myron Schwartz, M.D., Elizabeth Harrington, M.D., and **Moshe Haimov, M.D.,** *New York, N.Y.*

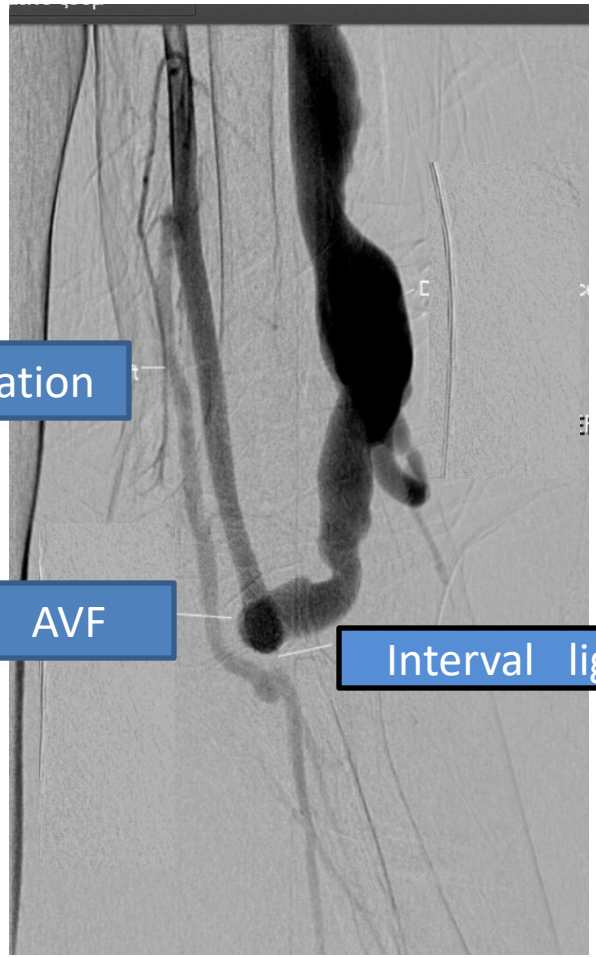


J Vasc Surg, 1988

Sink region



DRIL



Field M et al, Ann Royal Coll Sur Engl, 2009

Success rate of various techniques

Management technique	*Number of patients who were managed with the technique*	*Patients available for follow-up*	*Success rate (95% confidence interval)*
Ligation	27	25	0% (N/A)
Banding	22	21	38% (17%-59%)
Distal revascularization and interval ligation	21	20	80% (62%-98%)[a]
Improve inflow	9	7	43% (N/A)
Revision using distal inflow	4	3	100% (N/A)
Proximalization using arterial inflow	3	3	100% (N/A)
Distal revascularization	1	1	100% (N/A)

[a]Statistically significant at $P \leq .05$.

Gupta N, J Vasc Surg, 2011

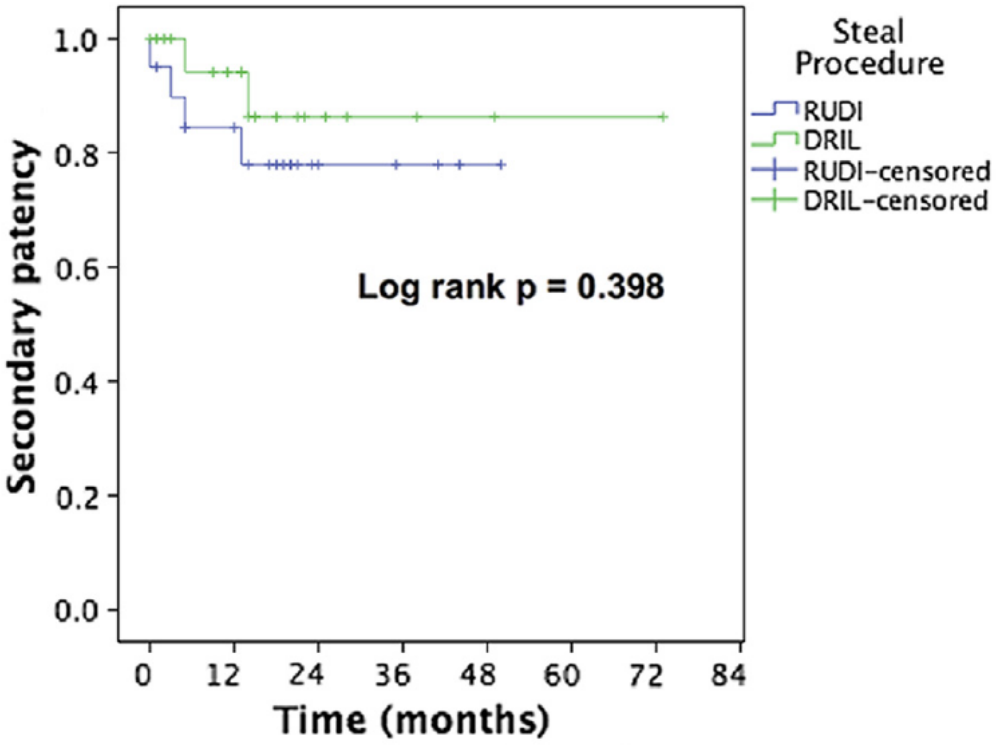
Comparison of DRIL vs. other procedures

Procedure (No.)	*Access preserved, %*	*Improvements of steal symptoms, %*	*30-day complications, %*	*Continued steal, %*
Ligation (61)	0	93	8.2	0
DRIL (56)	100	98	7.1	0
RUDI (19)	95	89	37	5.6
Banding (37)	89	75	47	33
PAI (9)	100	100	44	22
DRAL (13)	100	100	0	0
Total (216)	64	90	19	6.9

DRAL, Distal radial artery ligation; *DRIL*, distal revascularization with interval ligation; *PAI*, proximalization of arterial inflow; *RUDI*, revision using distal inflow.

Leake AE, J Vasc Surg 2015

Comparison of DRIL vs. RUDI



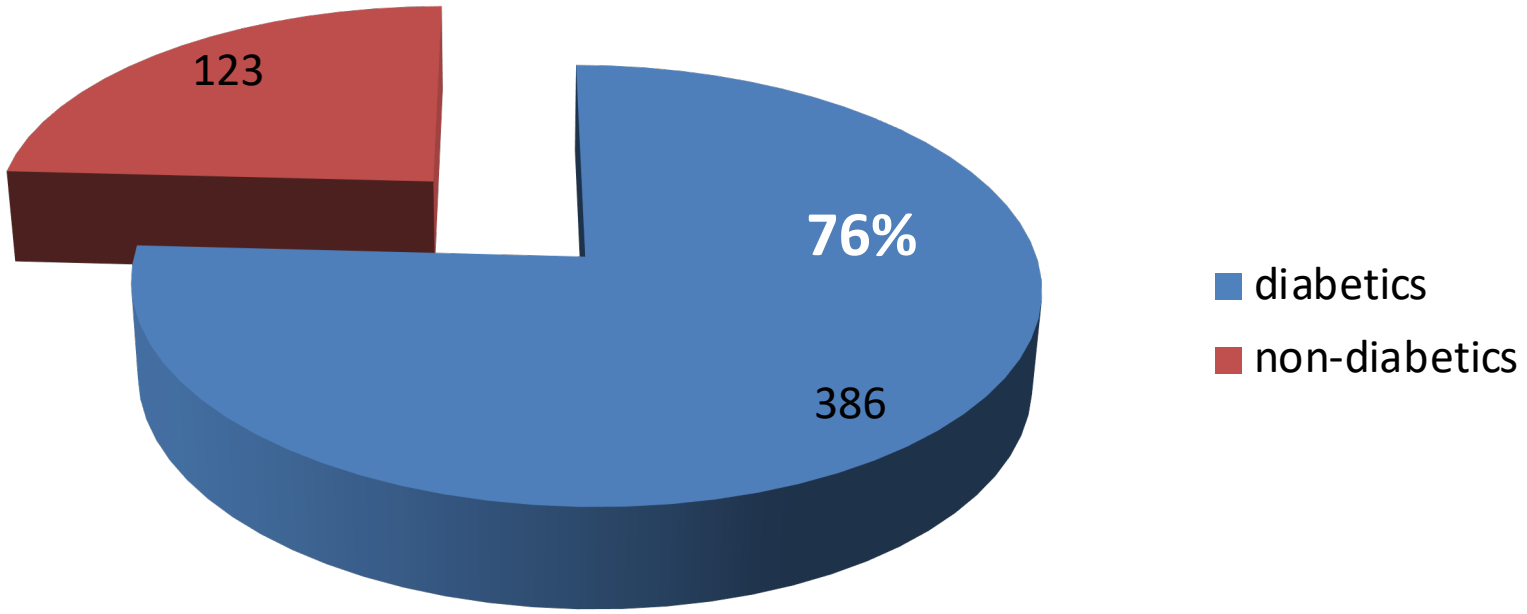
No. at risk							
RUDI	20	9	4	2	1	0	0
Cum. Patency (%)	100	84	78	78	78	78	78
Standard Error (%)	0	5	9	9	9	9	9
DRIL	21	14	5	3	1	1	1
Cum. Patency (%)	100	94	86	86	86	86	86
Standard Error (%)	0	6	9	9	9	9	9

Misskey J, J Vasc Surg 2016

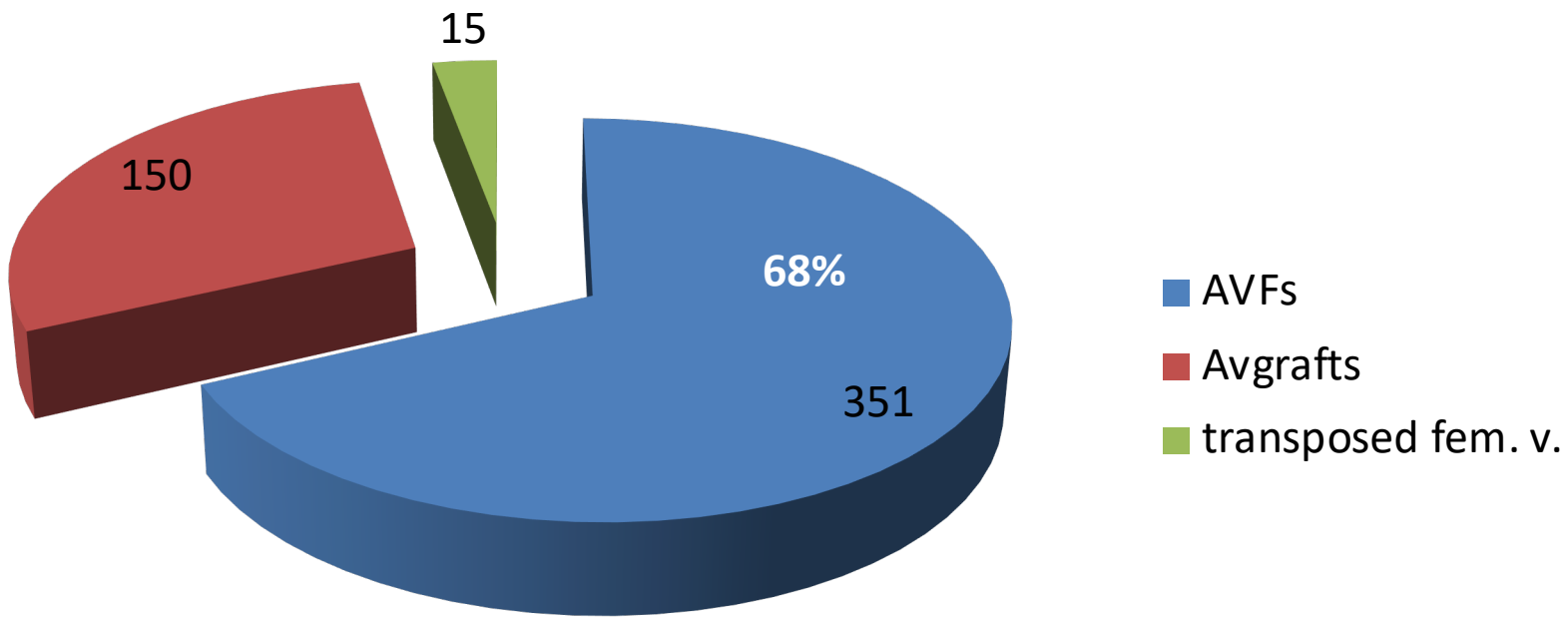
Meta-analysis of the existing DRIL series

- Inclusion criteria: DRIL series with ≥3 cases
- Search was performed following PRISMA guidelines
- 23 series were found including a total of 694 cases
- The Comprehensive Meta-Analysis (CMA) software was used (Biostat ® USA)

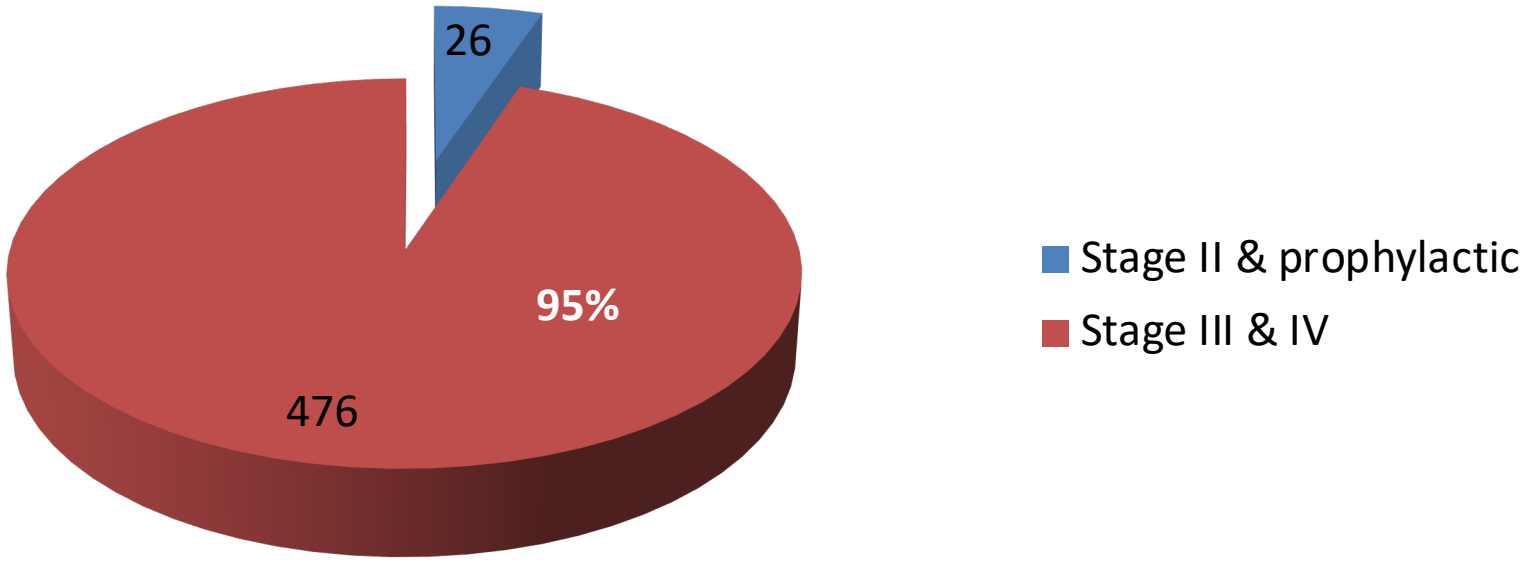
DRIL: prevalence of diabetics(N=509)



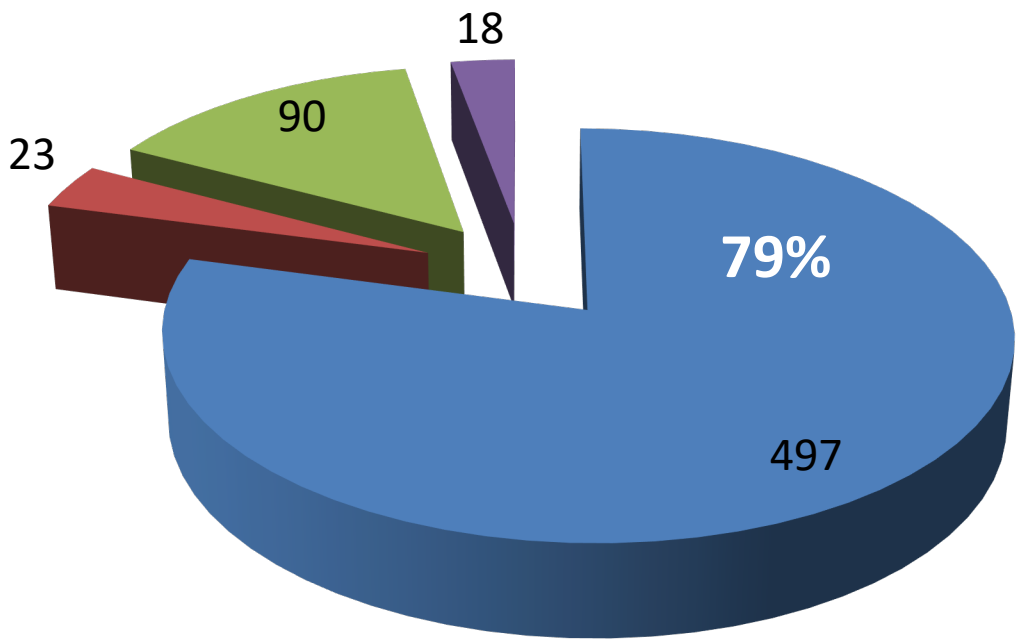
DRIL: initial type of access (N=516)



DRIL: indication (N=502)



DRIL: the preferred conduit (n=628)



Failure to improve following DRIL

Model	Study name	Time point	Events/Total	Statistics for each study			Weight (Fixed)
			Total	Event rate	Lower limit	Upper limit	Relative weight
	Schanzer	1992.	0 / 14	0.03	0.00	0.37	0.64
	Haimov	1996.	0 / 23	0.02	0.00	0.26	0.65
	Katz	1996.	1 / 6	0.17	0.02	0.63	1.10
	Berman	1997.	0 / 21	0.02	0.00	0.28	0.64
	Stierli	1998.	0 / 6	0.07	0.00	0.58	0.61
	Knox	2002.	5 / 55	0.09	0.04	0.20	5.99
	Diehl	2003.	0 / 14	0.03	0.00	0.37	0.64
	Korzets	2003.	0 / 9	0.05	0.00	0.47	0.63
	Lazarides	2003.	0 / 23	0.02	0.00	0.26	0.65
	Sessa	2004.	0 / 18	0.03	0.00	0.31	0.64
	Illig	2005.	1 / 9	0.11	0.02	0.50	1.17
	Mwipatayi	2006.	2 / 12	0.17	0.04	0.48	2.20
	Walz	2007.	13 / 38	0.34	0.21	0.50	11.28
	Huber	2008.	14 / 64	0.22	0.13	0.34	14.42
	Yu	2008.	1 / 24	0.04	0.01	0.24	1.26
	Field	2009.	0 / 6	0.07	0.00	0.58	0.61
	Gupta.	2011.	0 / 21	0.02	0.00	0.28	0.64
	Anaya-Ayal	2012.	8 / 33	0.24	0.13	0.42	7.99
	Aimaq	2013.	15 / 81	0.19	0.11	0.28	16.12
	Scali	2013.	24 / 134	0.18	0.12	0.25	25.98
	Kopriva	2014.	0 / 3	0.13	0.01	0.73	0.58
	Leake.	2015.	1 / 59	0.02	0.00	0.11	1.30
	Misskey	2016.	4 / 21	0.19	0.07	0.41	4.27
Fixed				0.17	0.14	0.21	

Event rate and 95% CI: -1.00 -0.50 0.00 0.50 1.00

I^2=41%

1-year access failure following DRIL

Model	Study	Time	Statistics: Event rate	Events/Tot: Total	Statistics for each study: Lower	Upper limit	Weight (Fixed): Relative weight
	Schanzer	1992.	0.14	2 / 14	0.04	0.43	2.09
	Haimov	1996.	0.26	6 / 23	0.12	0.47	5.40
	Katz	1996.	0.07	0 / 6	0.00	0.58	0.56
	Berman	1997.	0.05	1 / 21	0.01	0.27	1.16
	Knox	2002.	0.16	9 / 55	0.09	0.29	9.16
	Lazarides	2003.	0.30	7 / 23	0.15	0.52	5.92
	Diehl	2003.	0.21	3 / 14	0.07	0.49	2.87
	Korzets	2003.	0.11	1 / 9	0.02	0.50	1.08
	Sessa	2004.	0.03	0 / 18	0.00	0.31	0.59
	Walz	2007.	0.45	17 / 38	0.30	0.61	11.43
	Huber	2008.	0.30	19 / 64	0.20	0.42	16.25
	Yu	2008.	0.13	3 / 24	0.04	0.32	3.19
	Anaya-Ayal	2012.	0.06	2 / 33	0.02	0.21	2.29
	Scali	2013.	0.15	20 / 134	0.10	0.22	20.70
	Aimaq	2013.	0.20	16 / 81	0.12	0.30	15.62
	Kopriva	2014.	0.13	0 / 3	0.01	0.73	0.53
	Misskey	2016.	0.05	1 / 21	0.01	0.27	1.16
Fixed			0.21		0.17	0.25	

Event rate and 95% CI: -1.00 -0.50 0.00 0.50 1.00

I^2=55%

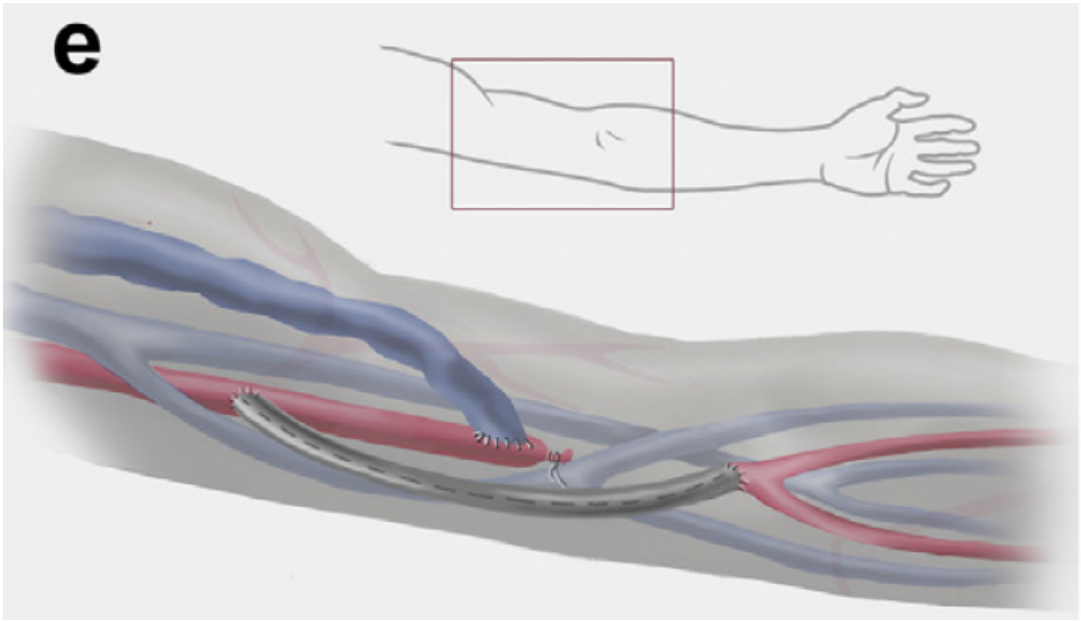
1-year arterial-arterial bypass failure

Model	Study name	Time point	Events/Total	Statistics for each study	Statistics for each study		Weight (Fixed)
			Total	Event rate	Lower limit	Upper limit	Relative weight
	Schanzer	1992.	0 / 14	0.03	0.00	0.37	1.12
	Haimov	1996.	1 / 23	0.04	0.01	0.25	2.22
	Katz	1996.	0 / 6	0.07	0.00	0.58	1.08
	Berman	1997.	0 / 21	0.02	0.00	0.28	1.13
	Knox	2002.	8 / 55	0.15	0.07	0.26	15.84
	Diehl	2003.	0 / 14	0.03	0.00	0.37	1.12
	Lazarides	2003.	2 / 23	0.09	0.02	0.29	4.23
	Sessa	2004.	1 / 18	0.06	0.01	0.31	2.19
	Illig	2005.	1 / 9	0.11	0.02	0.50	2.06
	Walz	2007.	19 / 38	0.50	0.35	0.65	22.02
	Huber	2008.	12 / 64	0.19	0.11	0.30	22.60
	Yu	2008.	1 / 24	0.04	0.01	0.24	2.22
	Anaya-Ayal	2012.	2 / 33	0.06	0.02	0.21	4.35
	Aimaq	2013.	2 / 81	0.02	0.01	0.09	4.52
	Scali	2013.	5 / 134	0.04	0.02	0.09	11.16
	Kopriva	2014.	0 / 3	0.13	0.01	0.73	1.01
	Misskey	2016.	0 / 21	[illegible]	0.00	0.28	1.13
Fixed				0.14	0.11	0.18	

Event rate and 95% CI: -1.00 -0.50 0.00 0.50 1.00

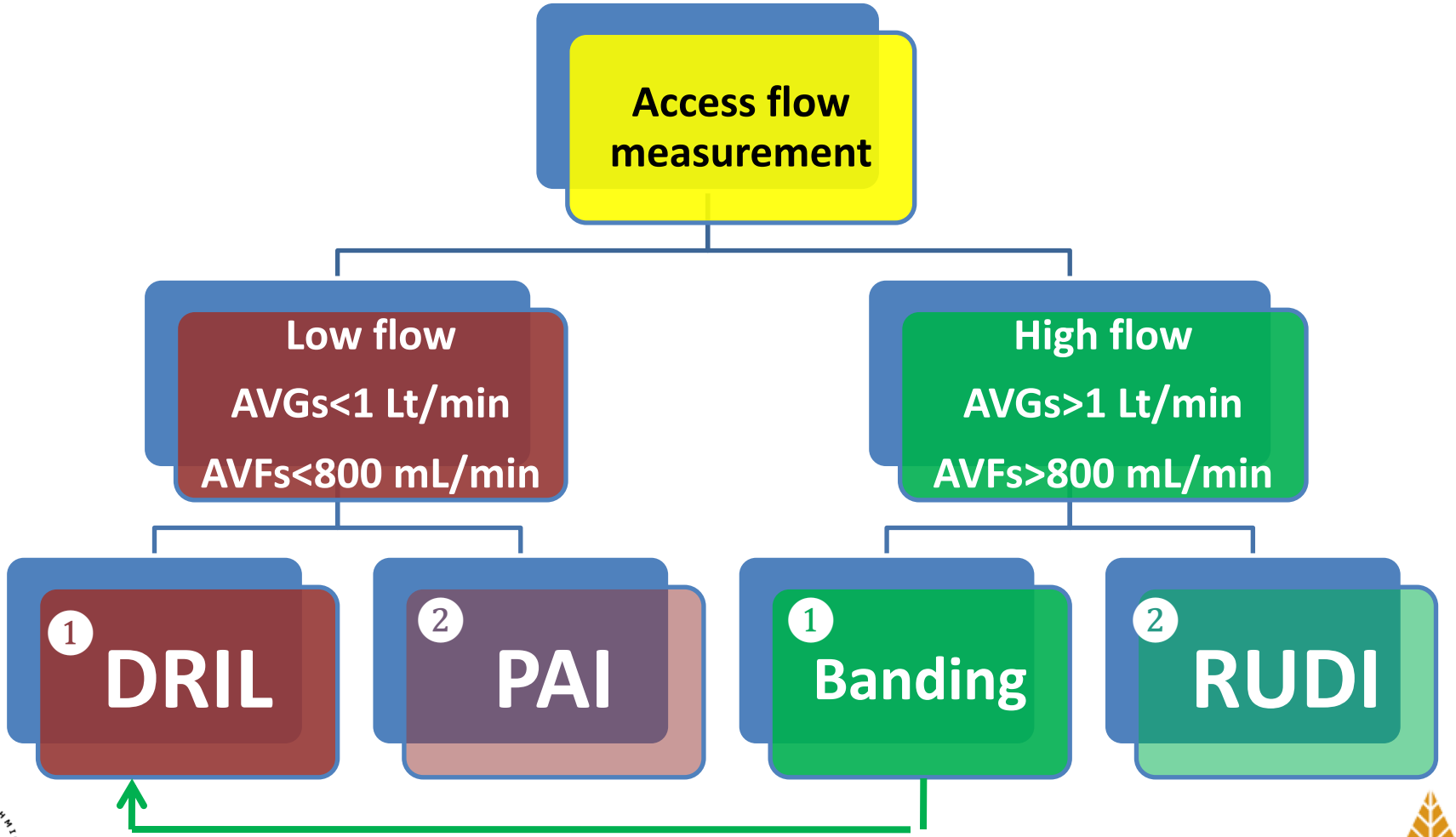
I^2=74%

ESVS access guidelines 2018



Recommendation 72		
Distal revascularisation and interval ligation should be considered in patients with vascular access induced limb ischaemia and upper arm access without high flow.	IIa	C

Access related distal ischemia following proximal AVFs or AVGs



Modified from Beathard et al, Semin Vasc Surg 2013