



CONTROVERSES ET ACTUALITES EN CHIRURGIE VASCULAIRE

CONTROVERSIES & UPDATES IN VASCULAR SURGERY

JANUARY 23-25 2020



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Stop the AVF Bashing

John F Lucas III, MD, FACS, FSVS

Greenwood Leflore Hospital

Greenwood, MS, USA

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Disclosurers

John F Lucas III, MD, FACS, FSVS

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I have the following potential conflicts of interest to report:

Investigator

InnAVasc Corp

Laminate

Consulting

Medtronic Corp

Speaker

Getinge Corp

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Jamaica 2016
Bridge of Life
Surgical Mission



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January 1, 2011 to October 9, 2019

3062 New access creations

2704 Primary AVFs

1695 Radiocephalic AVFs - 193/year

73% of all primary fistulas in last 3 years



New Approaches to Arteriovenous Fistula Creation

Dheeraj K. Rajan, MD, FRCPC, FSIR¹

following AVF creation between **20 and 60%** do not successfully mature

Seminars in Interventional Radiology, 2016 Mar; 33(1): 6–9.

Multiple preoperative and intraoperative factors predict early fistula thrombosis in the Hemodialysis Fistula Maturation Study

Alik Farber MD, Peter B. Imrey PhD, Thomas S. Huber MD, PhD, James M. Kaufman MD, Larry W. Kraiss MD, Brett Larive MS, Liang Li PhD, Harold I. Feldman MD

AVF maturation failure rates are high, varying from **18% to 53%**.

Journal of Vascular Surgery Volume 63, Issue 1, January 2016, Pages 163-170.e6



Radiocephalic Wrist Arteriovenous Fistula for Hemodialysis: Meta-analysis Indicates a High Primary Failure Rate P.P.G.M.Rooijens, J.H.M.Tordoir, T.Stijnen, J.P.J.Burgmans, A.A.E.A.Smet de, T.I.Yo

Author	Study years	Number of patients	Patients per year	Primary failure (%)
Alm <i>et al.</i> 22	1972–1974	67	22	30
Fernström <i>et al.</i> 24	1975–1985	71	6	29
Kherlakian <i>et al.</i> 25	1977–1983	106	15	12
Al-Mohaya <i>et al.</i> 29	1983–1988	112	19	3
Sparks <i>et al.</i> 30	1983–1993	147	13	12
Leapman <i>et al.</i> 32	1989–1994	144	24	13
Prischl <i>et al.</i> 33	1989–1994	123	21	23
Miller <i>et al.</i> 34	1990–1994	41	8	12
Bender <i>et al.</i> 35	1993	56	?	9
Lin <i>et al.</i> 36	1994–1995	126	61	24
Zeebregts <i>et al.</i> 37	1995–1999	150	30	28
Ascher <i>et al.</i> 38	1996–1999	47	12	25

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Cohen <i>et al.</i> 10	1966–1967	19	10	14
Röhl <i>et al.</i> 11	1966–1967	30	15	10
Kinnaert <i>et al.</i> 12	1966–1975	202	20	9
Tellis <i>et al.</i> 13	1968–1971	59	15	24
Zerbino <i>et al.</i> 14	1968–1974	160	23	9
Thompson <i>et al.</i> 15	1970–1972	77	26	13
Cheek <i>et al.</i> 16	1970–1973	84	21	4
Lindfors <i>et al.</i> 17	1970–1973	45	11	16
Paruk <i>et al.</i> 18	1971–1974	108	27	16
Tordoir <i>et al.</i> 19	1971–1981	114	11	10
Burger <i>et al.</i> 20	1971–1991	208	10	6
Thomsen <i>et al.</i> 21	1972–1978	191	27	26



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Percutaneous proximal radial artery arteriovenous fistula creation for hemodialysis using the Ellipsys™ vascular access system

J.E. Hull, J.H. Velez, J.P. Martinez

proximal radial artery and adjacent vein

May 21, 2013

10 Patients	Technical Success	Clinical Success
	100%	70%



Percutaneous creation of an arteriovenous fistula for hemodialysis access.

Rajan DK, Ebner A, Desai SB, Rios JM4, Cohn WE.

proximal ulnar artery and ulnar vein

August 2012

33 Patients	Cumulative Patency	Days to Maturation
6 Months	96%	58 days



Endovascular Creation of Arteriovenous Fistulae for Hemodialysis Access with a 4 Fr Device: Clinical Experience from the EASE Study

Berland TL, Clement J, Griffin J, Westin GG, Ebner A

32 Patients	Technical Success	Primary Patency	Cumulative Patency	
Initial	100%			
6 Months		83%	87%	



The Pivotal Multicenter Trial of Ultrasound-Guided Percutaneous Arteriovenous Fistula Creation for Hemodialysis Access

Jeffrey E. Hull MD, William C. Jennings MD,
Randy I. Cooper MD, Umar Waheed MD,
Matthew E. Schaefer DO, Rajeev Narayan MD

261 patients evaluated

28% unsuitable anatomy

16% medical exclusions

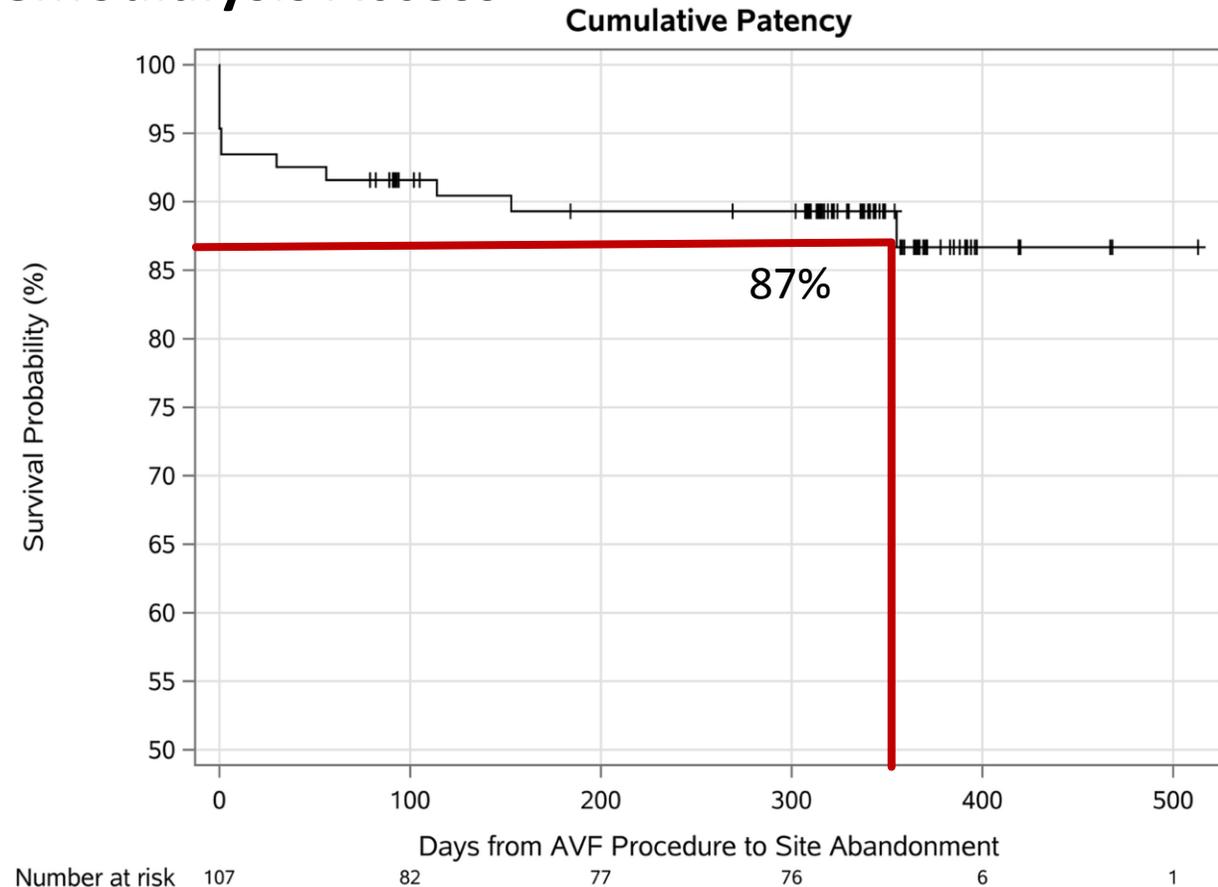
107 Patients treated

103 AVFs created

3 Thrombosed

1 AVF not created

71 patients received 2 needle dialysis





Single-Center Experience of Endovascular Arteriovenous Fistula Creation With Both WavelinQ and Ellipsys Systems

Robert Shahverdyan, MD,
William C. Jennings, MD,
Vladimir Matoussevitch, MD

	Ellipsys	WavelinQ
No. of patients	30	27
Technical success	100%	96%
Follow-up, days	89	129
Primary patency	64%	46%
Secondary patency	82%	58%
Maturation successful	71%	52%
Interventions	42%	54%
Conversions	13%	33%

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*Dr. James Cimino,
Dr. Kenneth Appel, and
Dr. Michael Brescia*

Brescia-Cimino fistula

February 1963 First AV fistula was created by Dr. Appel

April 1966 Dr. Cimino presented the result of 14 patients at the American Society for Artificial Internal Organs and later published their classic paper in the New England Journal of Medicine

A Milestone in Hemodialysis: James E. Cimino, MD, and the Development of the AV Fistula
Nelly Edmondson Gupta October 01, 2006 Renal And Urology News



Chronic Hemodialysis Using Venipuncture and a Surgically Created Arteriovenous Fistula

Michael J. Brescia, M.D., James E. Cimino, M.D., Kenneth Appel, M.D., and Baruch J. Hurwich, M.D.

Local anesthesia

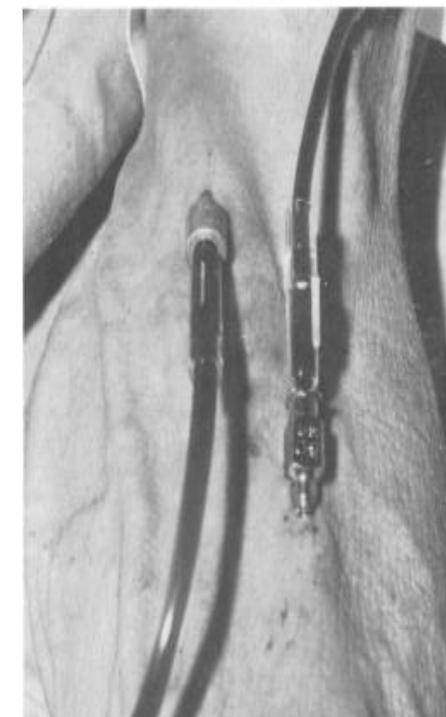
Radial artery is mobilized

Largest available neighboring vein is mobilized

0.3 to 0.5 cm., is made in the artery and vein.

Side-to-side anastomosis is made with continuous 7-0 arterial silk

Dialysis may be performed the day following surgery





Arteriovenous Fistulas for
Chronic Hemodialysis at
the Bronx VA Hospital
July 1, 1966

12 of 14 (86%)
used for hemodialysis

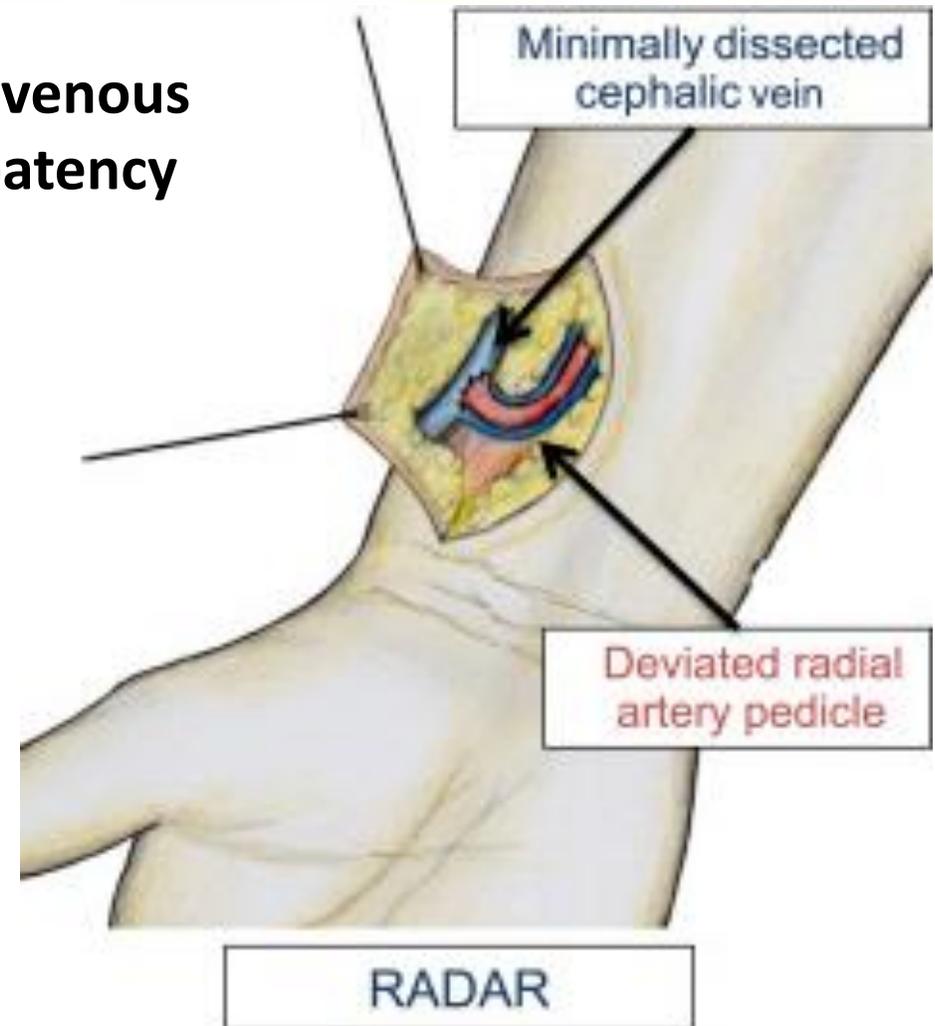
PATIENT	AGE	DIAGNOSIS	PERIOD ON CHRONIC HEMODIALYSIS	DATE FISTULA CREATED	PERIOD IN USE	TOTAL DIALYSES USING FISTULA	COMPLICATIONS
			<i>mo.</i>		<i>mo.</i>		
G.A.	54	Chronic pyelonephritis; chronic glomerulonephritis.	19	2/19/65	0	0	Fistula made too small & never functioned
J.S.	28	Chronic glomerulonephritis.	10	3/21/66 3/9/65	3-1/2 8	30 40	None None (patient died – see text)
F.G.	37	Chronic glomerulonephritis.	15-1/2	3/19/65	15-1/2	113	None
A.M.	43	Chronic glomerulonephritis.	24	3/24/65	15-1/2	140	None
G.B.	44	Chronic glomerulonephritis.	17	3/26/65	15	125	None
C.H.	49	Chronic glomerulonephritis.	16	4/16/65	14-1/2	121	None
L.L.	40	Chronic glomerulonephritis.	12-1/2	7/22/65	0	0	Arteriovenous fistula never functioned
B.J.	45	Chronic glomerulonephritis.	15-1/2	8/4/65	11	77	None
M.G.	46	Polycystic renal disease.	10-1/2	8/27/65	10	48	None
J.F.	43	Chronic glomerulonephritis.	14-1/2	9/10/65	10	64	None
W.P.	46	Chronic glomerulonephritis.	19	3/24/66	3	30	None
G.H.	49	Chronic glomerulonephritis.	13	3/21/66	3	26	None
S.D.	37	Chronic glomerulonephritis.	1/2	6/20/66	1/2	2	None
W.L.	45	Chronic glomerulonephritis	1/2	6/21/66	1/2	2	None

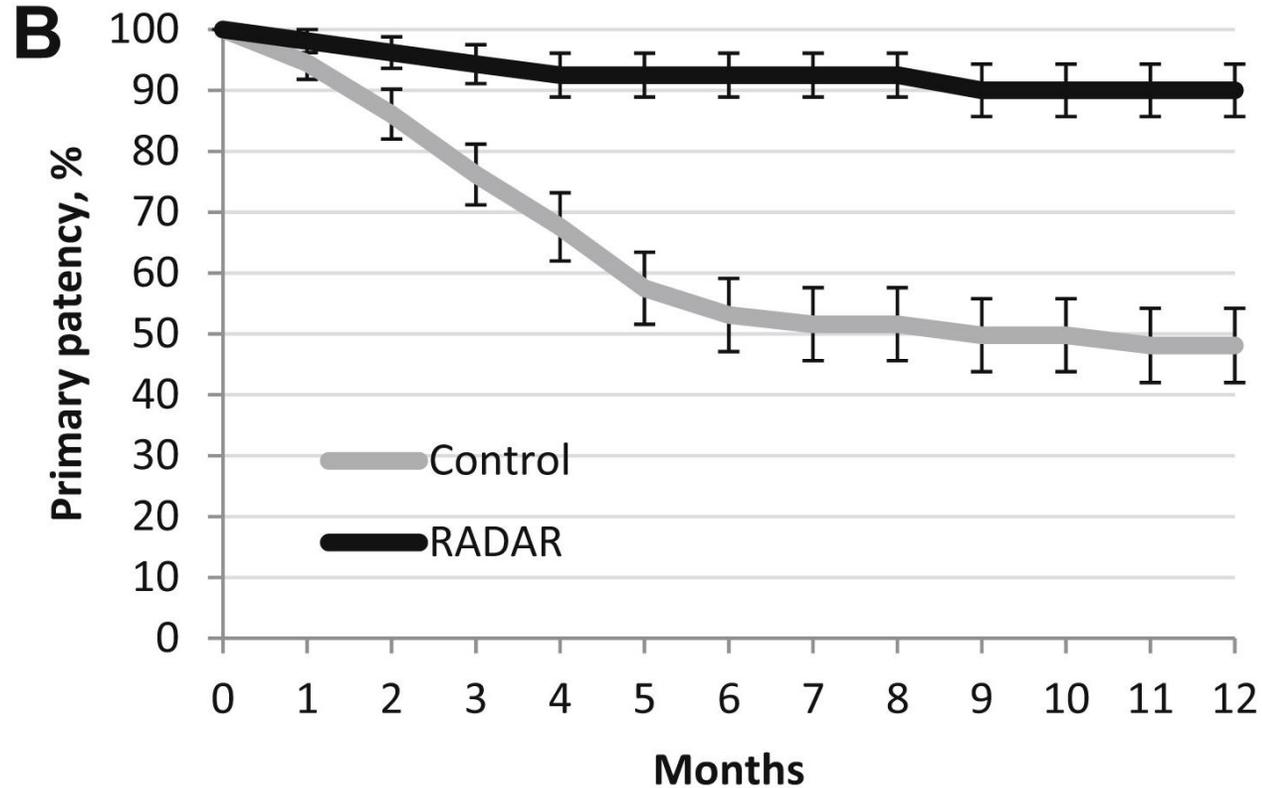


Radial artery deviation and reimplantation inhibits venous juxta-anastomotic stenosis and increases primary patency of radial-cephalic fistulas for hemodialysis

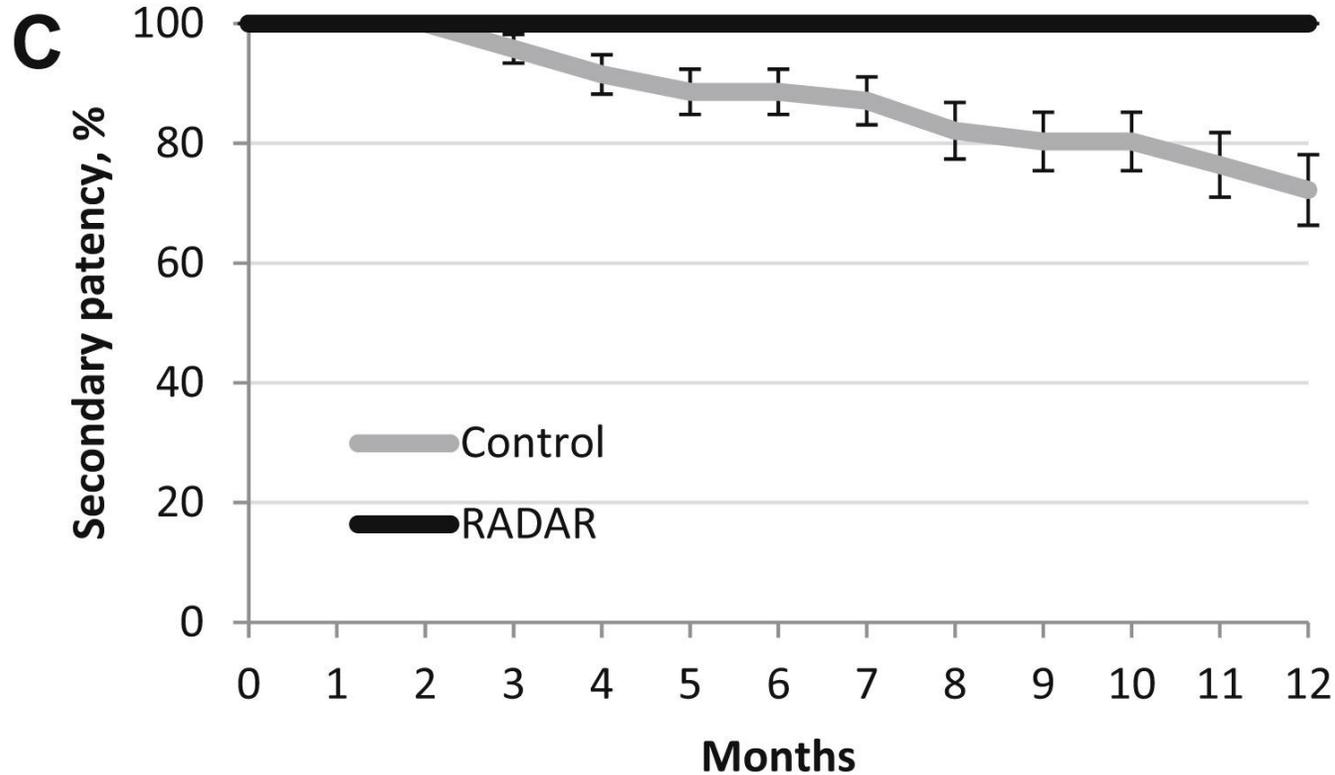
Nirvana Sadaghianloo, MD, Serge Declémy, MD, Elixène Jean-Baptiste, MD, PhD, Pierre Haudebourg, MD, Christophe Robino, MD, Mohamed Shariful Islam, MD, Réda Hassen-Khodja, MD, Alan Dardik, MD, PhD

radial artery ≥ 2 mm in diameter free of heavy calcifications,
patent palmar arch,
patent ulnar artery free of heavy calcifications,
cephalic vein ≥ 2 mm in diameter and ≥ 10 cm in length





Primary patency	Time in months	0	1	3	6	9	12
Control	Number at risk	73	67	54	33	28	23
RADAR	Number at risk	53	52	50	45	28	14

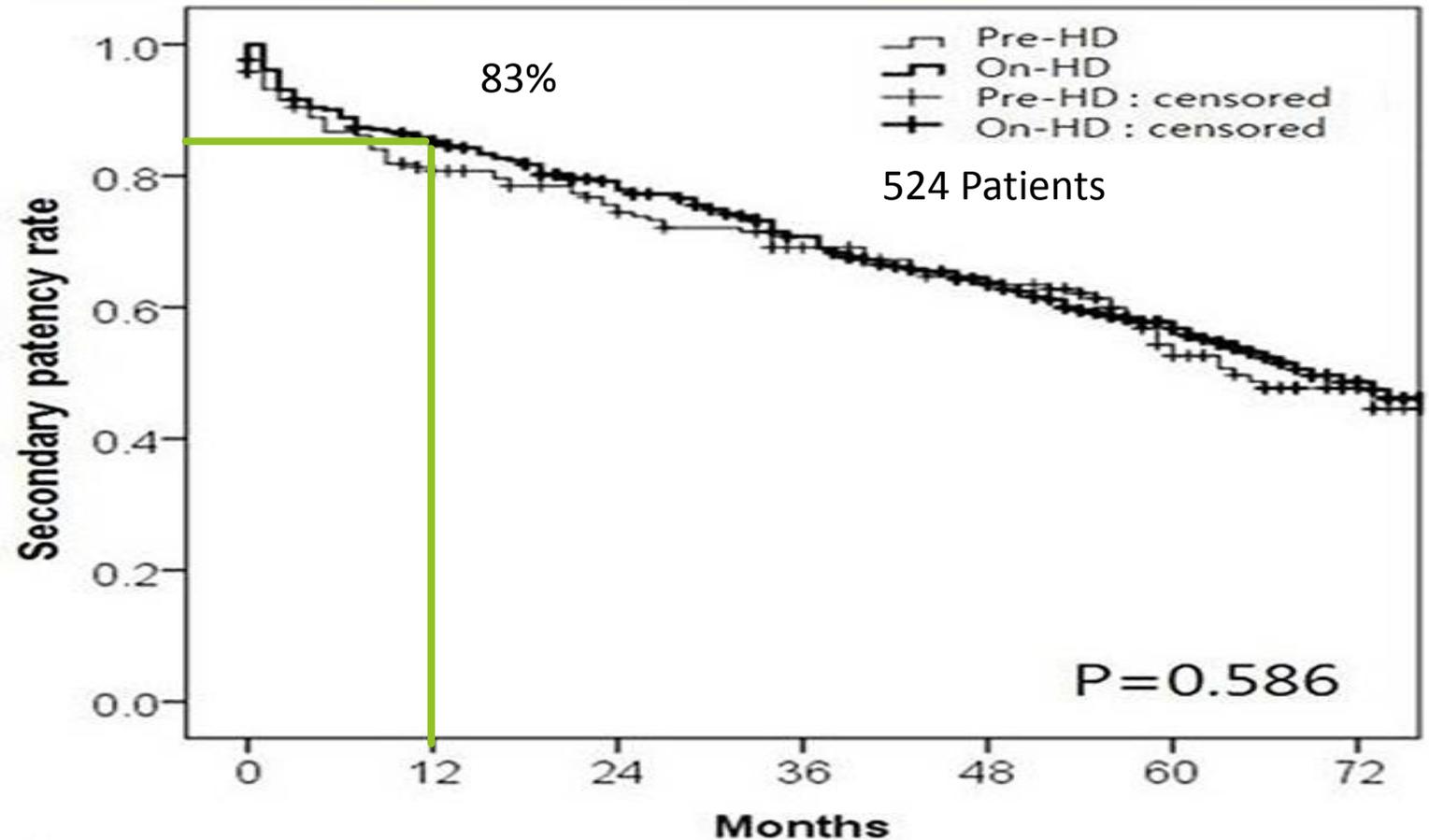


Secondary patency	Time in months	0	1	3	6	9	12
Control	Number at risk	73	71	67	57	41	32
RADAR	Number at risk	53	53	53	49	31	16



Patency rates of arteriovenous fistulas created before versus after hemodialysis initiation

Seonjeong Jeong et al
Seoul, Republic of Korea



No. at risk	0	12	24	36	48	60	72
Pre-HD	191	145	127	112	100	58	30
On-HD	333	274	237	203	162	107	42



Microsurgical creation and follow-up of arteriovenous fistulae for chronic haemodialysis in children

Pierre Bourquelot, Olivier Cussenot, Pierre Corbi, Gérard Pillion, Marie-France Gagnadoux, Albert Bensman, Chantal Loirat & Michel Broyer

Three hundred and eighty-eight children underwent 434 angioaccesses

388 Children	Immediate Patency	Functional Patency	Cumulative Patency
2 Years	96%	70%	85%
4 Years			60%



Creating arteriovenous fistulas for children in Guatemala

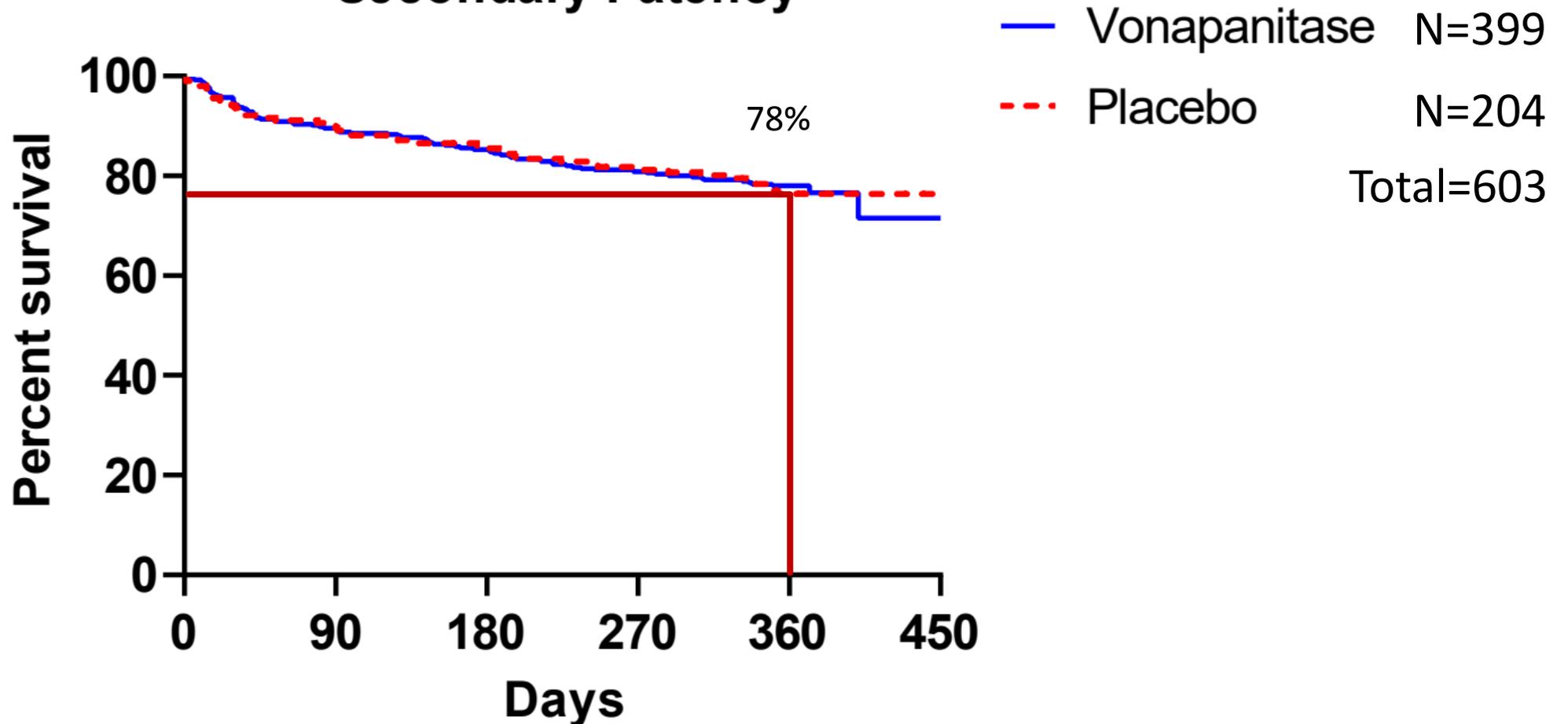
William C. Jennings MD, Randall Lou-Meda, MD, Nasir Mushtaq, PhD, MBBS, MPH, Alexandros Mallios, MD, Sindy Méndez-Soveranis, MD, Raúl Ernesto Sosa Tejada, MD, John F. Lucas III, MD, Wayne S. Gradman, MD

54 Patients	Primary Patency	Cumulative Patency
12 Months	83%	85%
36 Months	62%	85%



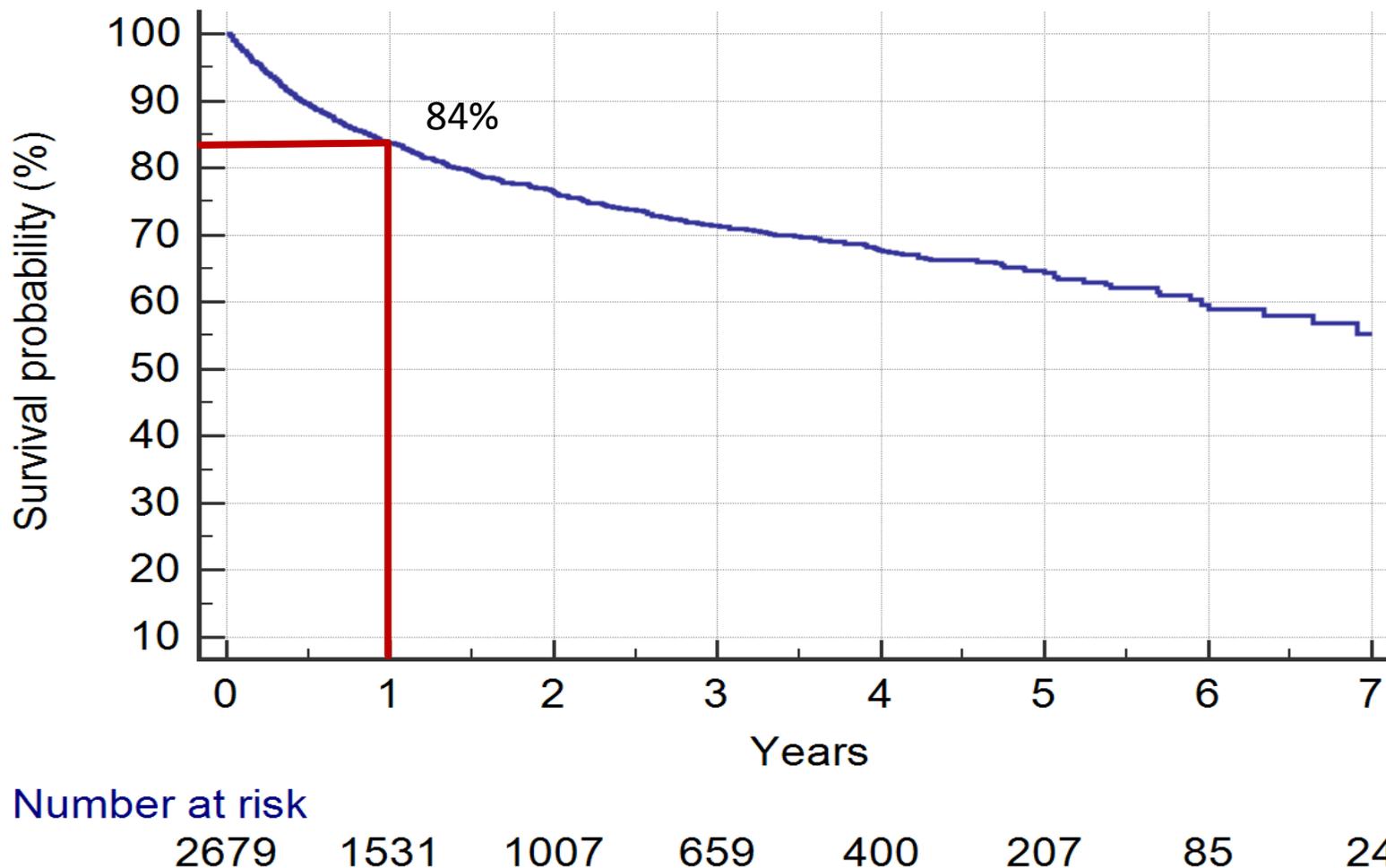
Proteon Trial

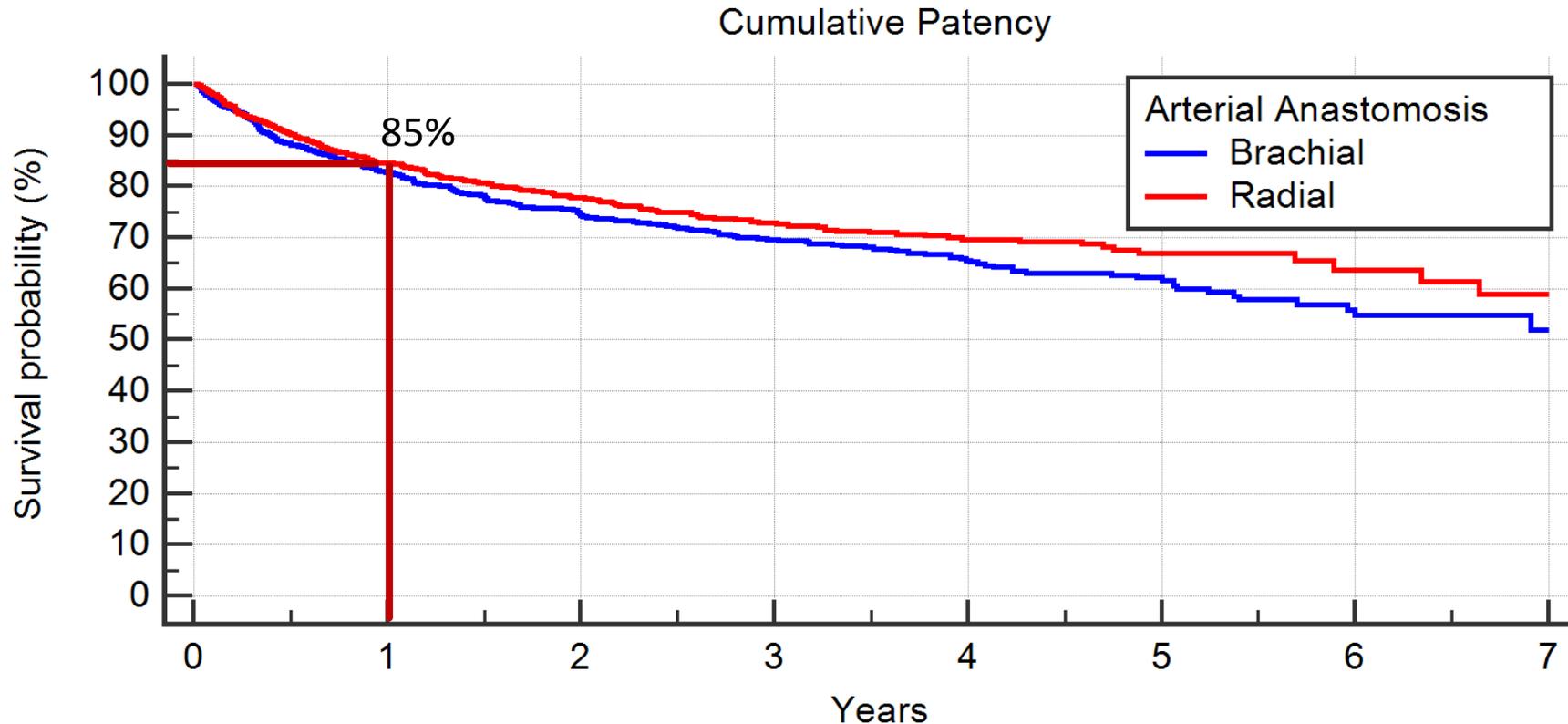
Secondary Patency





Cumulative Patency of Surgical AVFs





Number at risk

Brachial

1044	618	450	320	208	117	50	14
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Radial

1624	908	555	337	190	90	35	10
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	Surgical AVF	Percutaneous AVF
Years in Use	57	8

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