BUILDING ENDOVASCULAR SYNERGIES

MEET 2015
MULTIDISCIPLINARY EUROPEAN ENDOVASCULAR THERAPY

Acute popliteal endograft occlusion: frequency and management Femoropopliteal disease - Managing complications

Dr. E. Puras Mallagray
Hospital Universitario Quirón Madrid
SPAIN

MEET 2015
MULTIDISCIPLINARY EUROPEAN ENDOVASCULAR THERAPY

Disclosure

Speaker name:

.....ENRIQUE PURAS.....

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

Compared with a peripheral bypass, an endovascular repair at the popliteal artery has :

MEET 2015
MULTIDISCIPLINARY EUROPEAN ENDOVASCULAR THERAPY

- Quicker functional recovery
- Shorter hospitalization
- Minimal blood loss
- Avoidance of general anesthesia

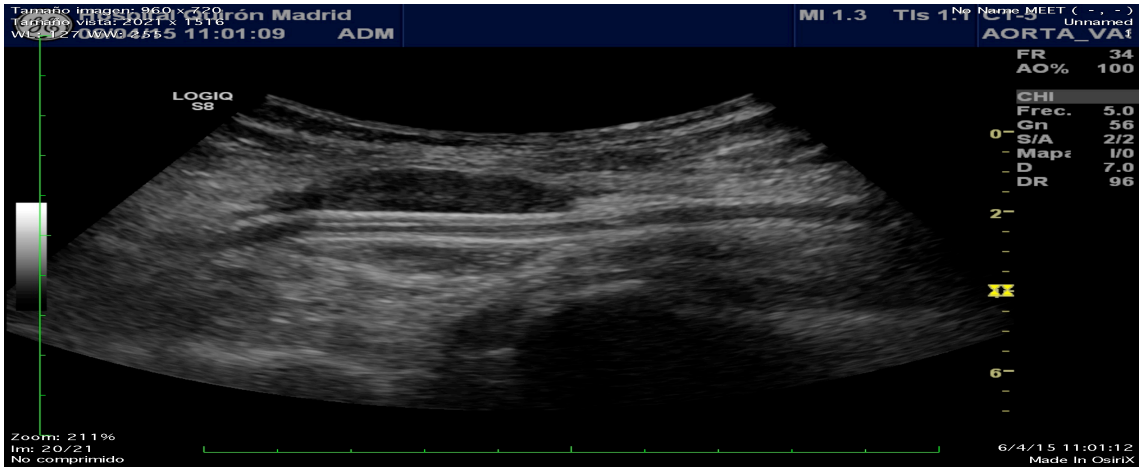
But needs……..

- ◆Good distal runoff and landing zones
- ◆Flexible stents
- ◆Double antiplatelet therapy
- ◆Follow up schedule (Duplex +Rx)

Current Indications for Covered Stents in femoropopliteal/popliteal disease

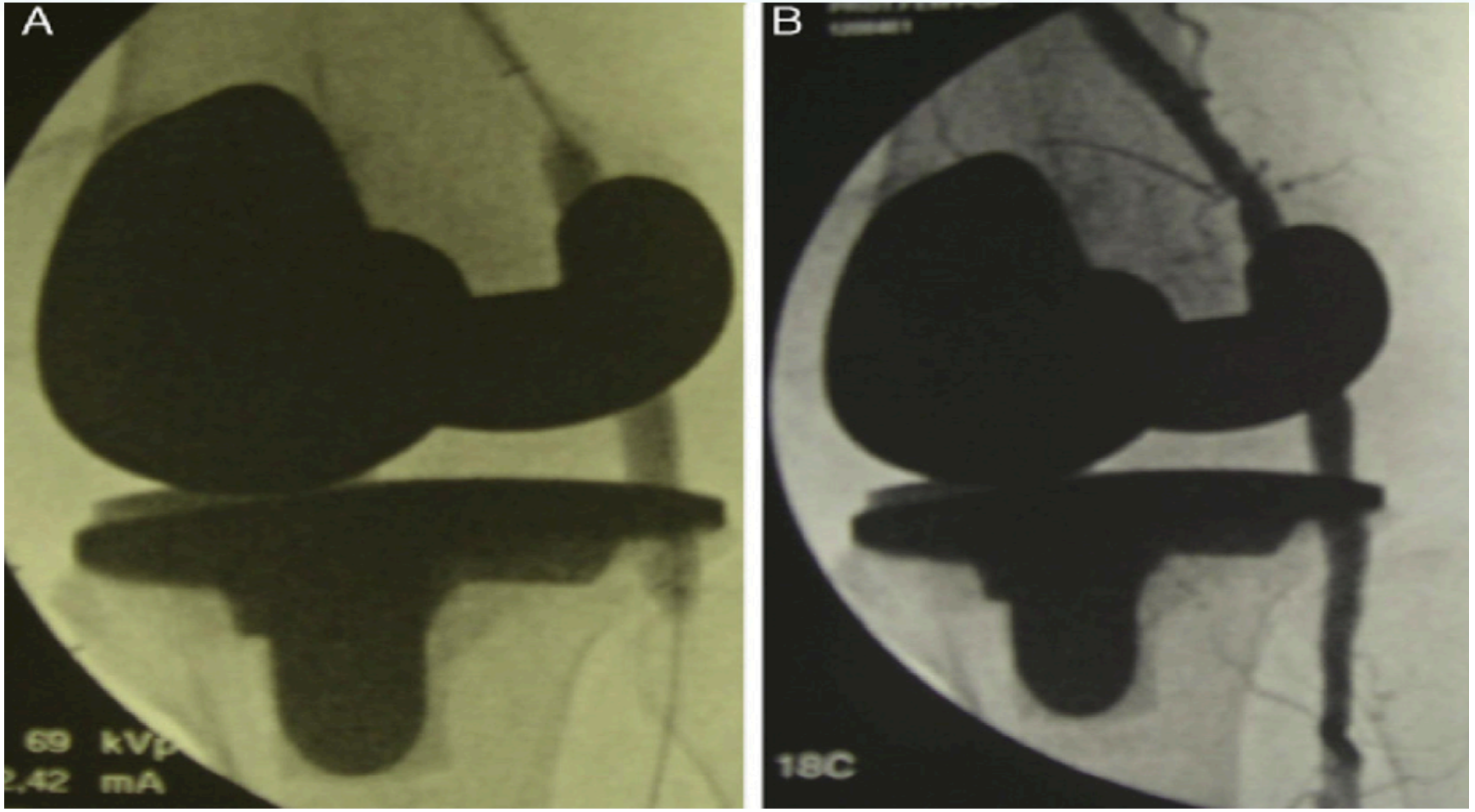
MEET 2015
MULTIDISCIPLINARY EUROPEAN ENDOVASCULAR THERAPY

- Popliteal Artery Aneurysms
- Long chronic occlusions SFA and popliteal artery
- SFA-popliteal arterial trauma
- Bailout stenting in endovascular scenarios
- Reline stenting in intimal hyperplasia cases



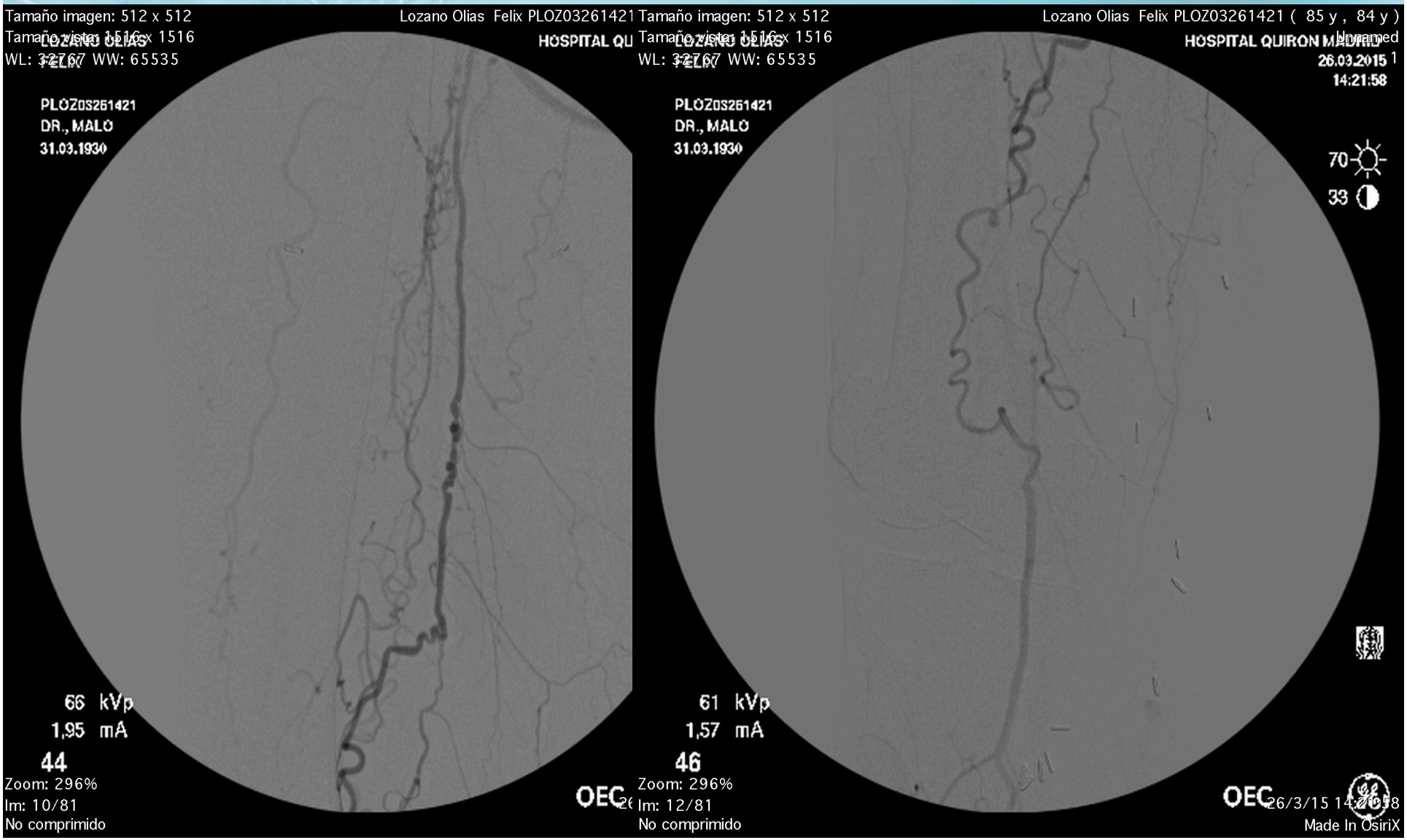
Femoropopliteal disease: Managing complications

MEET 2015
MULTIDISCIPLINARY EUROPEAN ENDOVASCULAR THERAPY



Femoropopliteal disease: Managing complications

MEET 2015
MULTIDISCIPLINARY EUROPEAN ENDOVASCULAR THERAPY

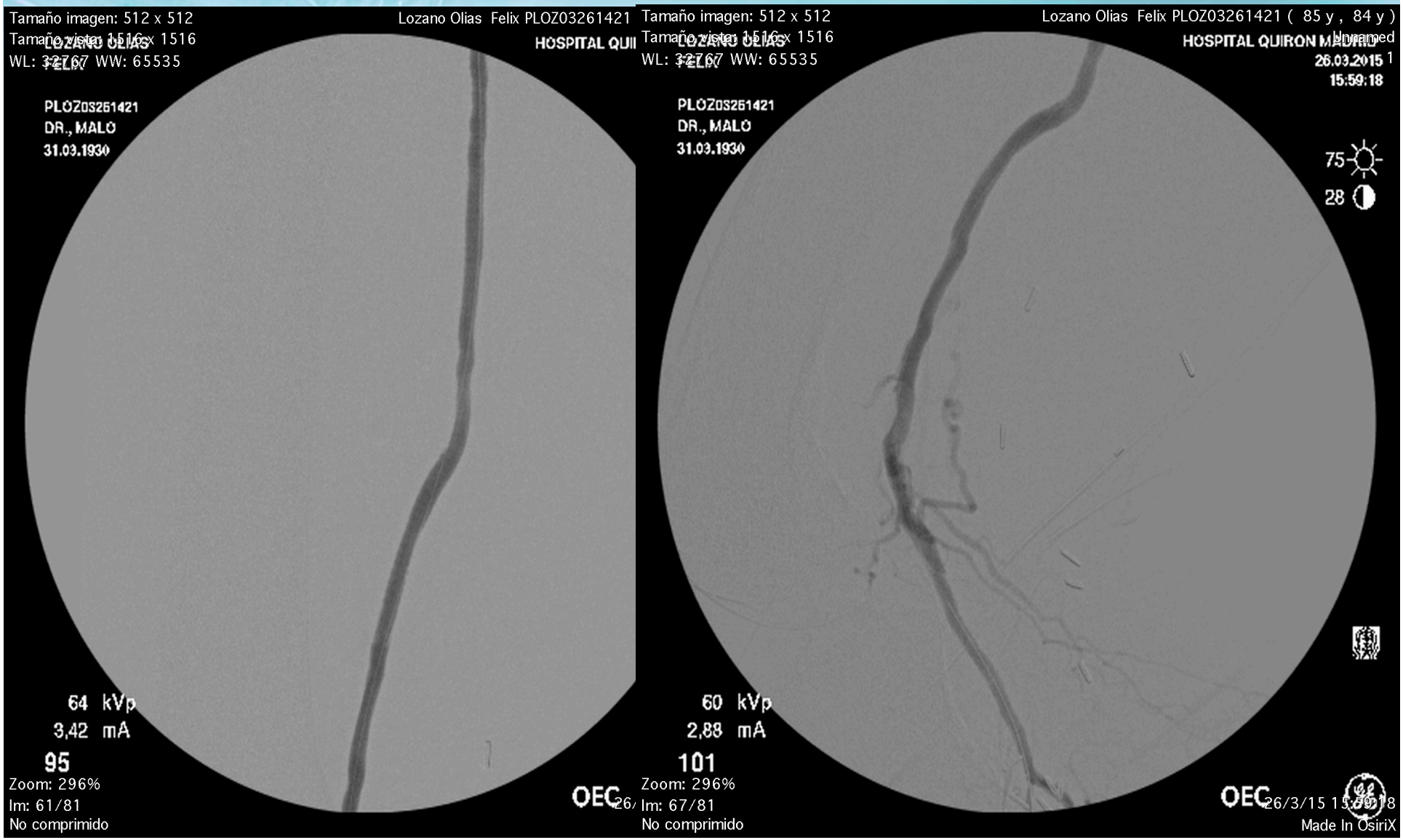


Femoropopliteal disease: Managing complications

MEET 2015
MULTIDISCIPLINARY EUROPEAN ENDOVASCULAR THERAPY

Femoropopliteal disease: Managing complications

MEET 2015
MULTIDISCIPLINARY EUROPEAN ENDOVASCULAR THERAPY



Transfemoral endoluminal stented graft repair of a popliteal artery aneurysm

Marin ML, Veith FJ, Panetta TF, Cynamon J, Bakal CW, Suggs WD, Wengerter KR, Baronè HD, Schonholz C, Parodi JC.

J Vasc Surg. 1994 Apr;19(4):754-7

"Two balloon-expandable stents were attached to a 6 mm polytetrafluoroethylene graft……"

Eur J Vasc Endovasc Surg (2008) 36, 96—100

ELSEVIER

REVIEW

Endovascular and Open Approaches to Non-thrombosed Popliteal Aneurysm Repair: A Meta-analysis

R.E. Lovegrove, M. Javid, T.R. Magee, R.B. Galland*

MEET 2015 MULTIDISCIPLINARY EUROPEAN ENDOVASCULAR THERAPY

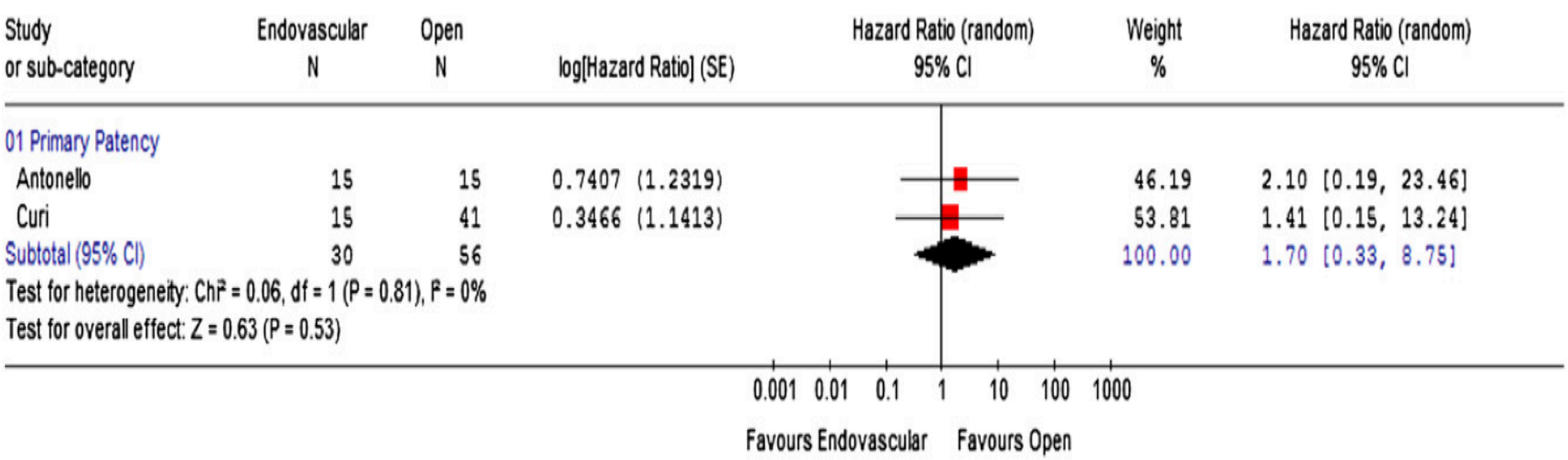


Figure 1 Forest plot illustrating long-term graft patency following open and endovascular popliteal aneurysm repair

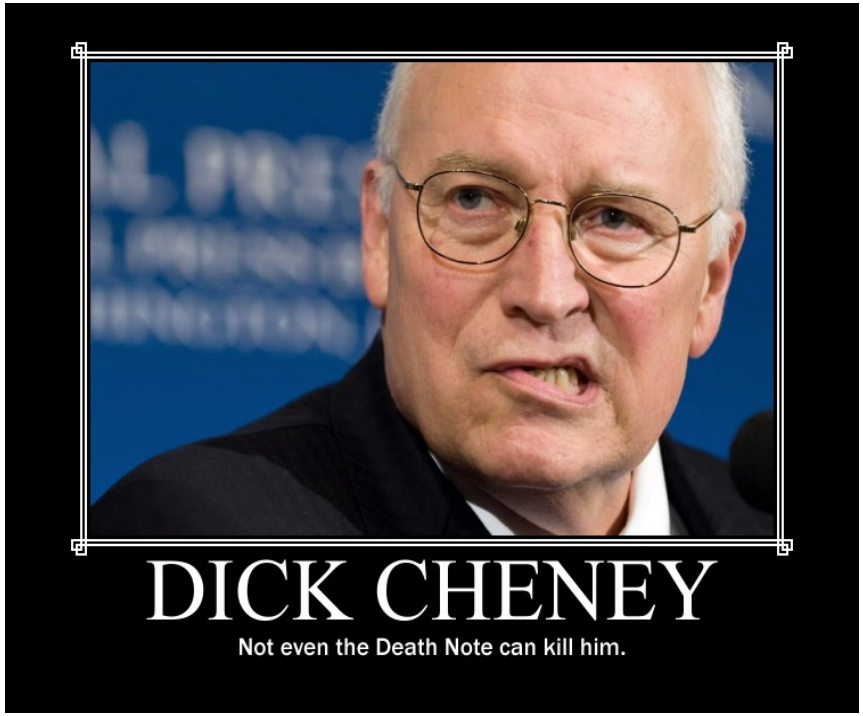
"With the technology currently available it is difficult to justify endovascular repair for patent popliteal aneurysms"

The Washington Post

MEET 2015
MULTIDISCIPLINARY EUROPEAN ENDOVASCULAR THERAPY

Vice President Has Procedure for Aneurysms in His Knees

- Published: September 25, 2005
- WASHINGTON, Sept. 24 - Vice President Dick Cheney successfully underwent medical procedures to repair aneurysms in arteries behind both knees on Saturday, his office said.
- The procedures used "a minimally invasive endovascular technique" that involves implanting a device known as a stent-graft and was performed under local anesthesia, Mr. Cheney's office said.



Dr. Katzen: He is doing FINE!!!!!!!!!

Miami doctor helps fix Cheney's knees

At the vice president's annual physical in July, doctors detected bulges known as aneurysms in the arteries that run behind each knee.

By JACOB GOLDSTEIN
jgoldstein@herald.com

A Miami doctor was part of the five-man team that recently fixed the arteries behind Vice President Cheney's knees.

A retrospective multicenter study of endovascular treatment of popliteal artery aneurysm

Dominique Midy, PhD, MD,[a] Xavier Berard, MD,[a] Michel Ferdani, MD,[b] Pierre Alric, PhD, MD,[c] Vincenzo Brizzi, MD,[a] Eric Ducasse, PhD, MD,[a] and Gerard Sassoust, MD;[a] AURC French University Association for Vascular Surgery, *Bordeaux, Marseille, and Montpellier, France*

JOURNAL OF VASCULAR SURGERY
April 2010

57 PAA in 50 pts

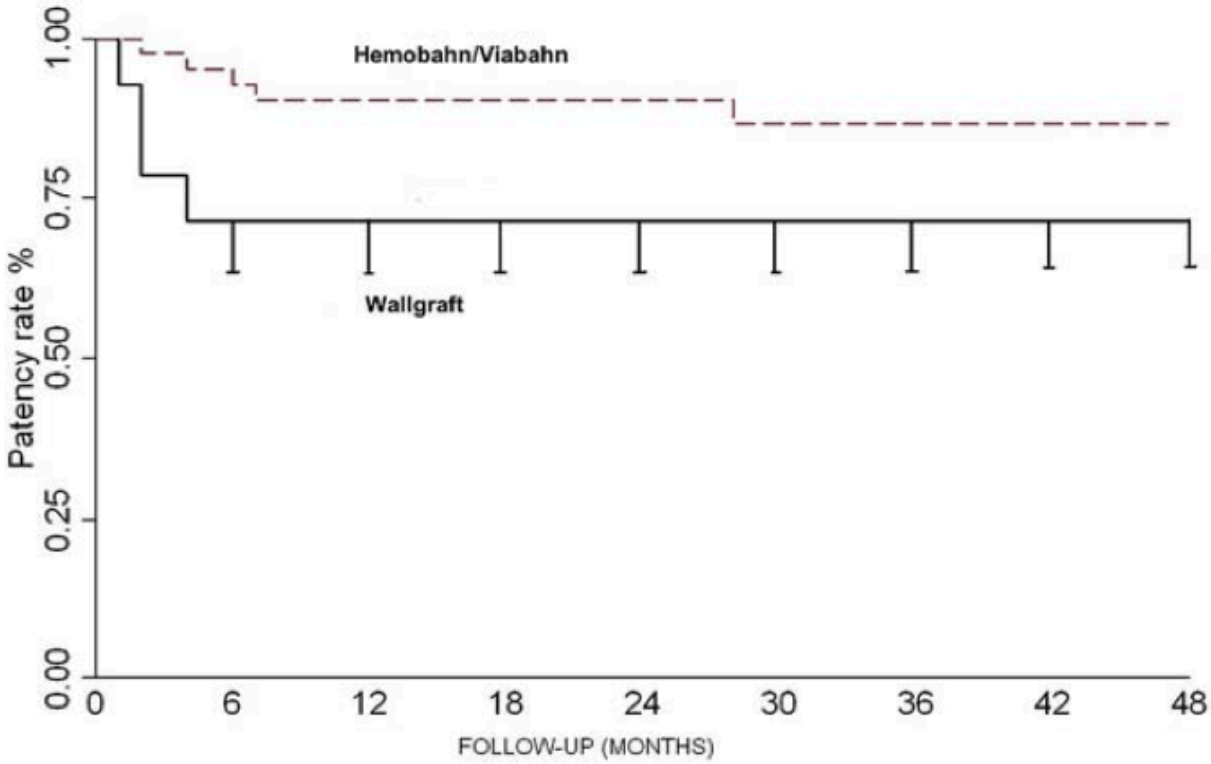
Patients with stent graft occlusion

Patients	*Delay to occlusion (months)*	*Reintervention*	*Status (months of follow-up)*
1	2	Bypass	Patent (39 m)
2	28	thrombolysis	Patent (53 m)
3	7	Bypass	Patent (61 m)
4	2	Bypass	Patent (24 m)
5	1	Bypass	Patent (20 m)
6	2	Bypass	Patent (23 m)
7	6	None	—
8	12	Thrombolysis stent	Patent (26 m)
9	4	Amputation	—

A retrospective multicenter study of endovascular treatment of popliteal artery aneurysm

Dominique Midy, PhD, MD,[a] Xavier Berard, MD,[a] Michel Ferdani, MD,[b] Pierre Alric, PhD, MD,[c] Vincenzo Brizzi, MD,[a] Eric Ducasse, PhD, MD,[a] and **Gerard Sassoust, MD;[a] AURC French University Association for Vascular Surgery,** *Bordeaux, Marseille, and Montpellier, France*

JOURNAL OF VASCULAR SURGERY
Anril 2010



5. Comparison of cumulative primary patency in Hemobahn-Viabahn and Wallgraft groups.

Outcome of endovascular repair of popliteal artery aneurysm using the Viabahn endoprosthesis

Karan Garg, MD, Caron B. Rockman, MD, Billy J. Kim, MD, Glenn R. Jacobowitz, MD, Thomas S. Maldonado, MD, Mark A. Adelman, MD, Frank J. Veith, MD, and Neal S. Cayne, MD,
New York, NY

MEET 2015 MULTIDISCIPLINARY EUROPEAN ENDOVASCULAR THERAPY

JOURNAL OF VASCULAR SURGERY
June 2012

Table IV. Review of the literature for popliteal artery aneurysms treated with flexible stents

First author	*Year*	*Endo repairs (No.)*	*Stent (No.)*	*Follow-up (months)*	*Primary patency at 1 year (%)*	*Limb salvage (%)*
Henry[9]	2000	12	W, 1	20	78	NR
Howell[10]	2002	13	W	12	69	NR
Gerasimidis[11]	2003	9	H, 6; W, 2	12	64 (4 occlusions: H, 3; W, 1)	100
Stone[12]	2005	7	W, 5; H, 2	20	2 occlusions	100
Antonello[13]	2005	15	H	46	86.7	100
Tielliu[14]	2005	57	H/V	24	80	100
Mohan[15]	2006	30	H/V, 26	24	80	100
Rajasinghe[16]	2006	23	V	7	93 (7/23 lost to follow-up)	100
Curi[17]	2007	15	V	14	100 (6/15 lost to follow-up)	NR
Idelchik[18]	2009	33	V/W	35	93.9	100
Midy[19]	2010	57	H/V, 42; W, 14	36	85.8	96.5
Jung[20]	2010	15	V	54	84.6	100
Garg	2011	26	V	22	91 (1/26 lost to follow-up)	100

H, Hemobahn, *NR*, not reported; *V*, Viabahn; *W*, Wallgraft.

Outcome of endovascular repair of popliteal artery aneurysm using the Viabahn endoprosthesis

Karan Garg, MD, Caron B. Rockman, MD, Billy J. Kim, MD, Glenn R. Jacobowitz, MD, Thomas S. Maldonado, MD, Mark A. Adelman, MD, Frank J. Veith, MD, and Neal S. Cayne, MD,
New York, NY

MEET 2015 MULTIDISCIPLINARY EUROPEAN ENDOVASCULAR THERAPY

JOURNAL OF VASCULAR SURGERY
June 2012

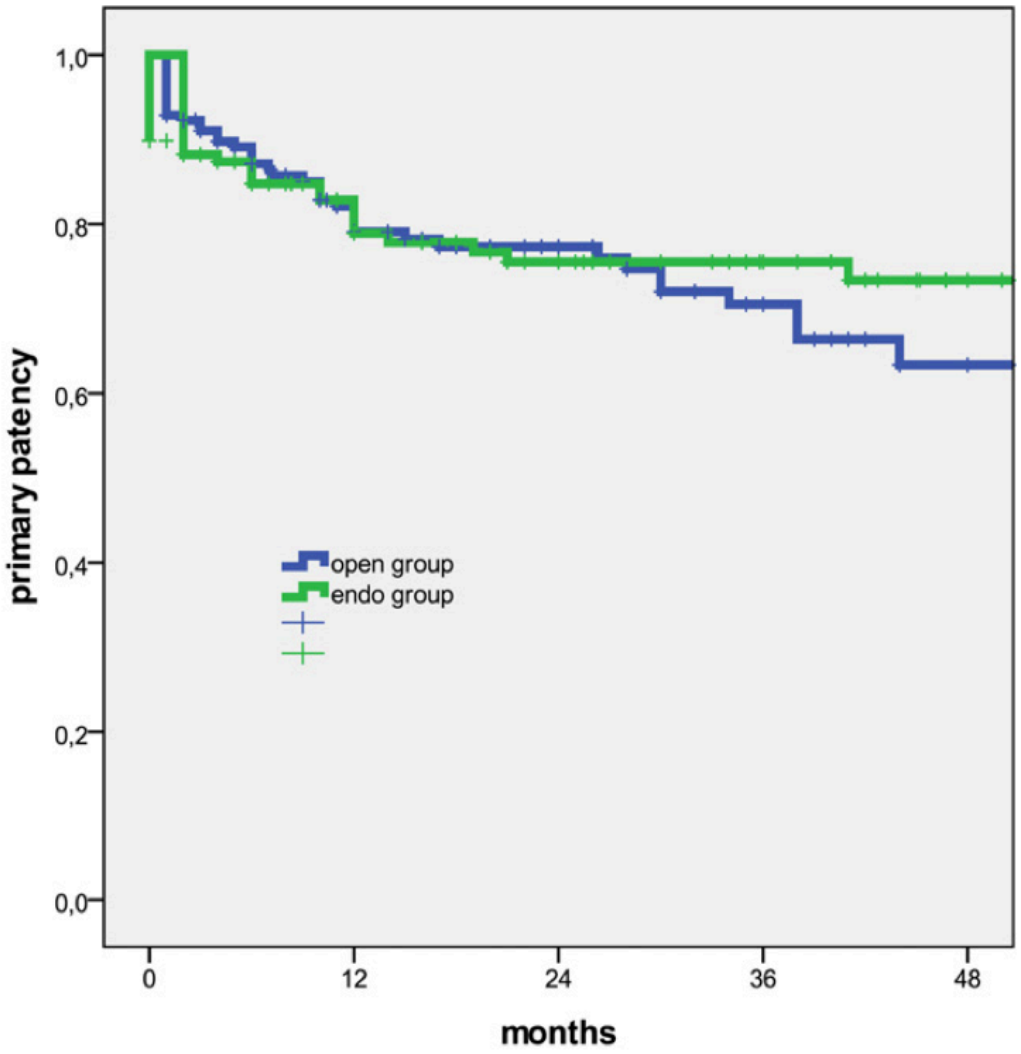
Table III. Predictors of stent graft occlusion

Predictor	*Variable*	*Patients (No.)*	*Occlusions (No.)*	P
Number of stents	1	11	1	.21
	2	11	2	
	>3	2	0	
Antilipid therapy	Yes	19	3	.34
	No	5	0	
Sex	Male	22	3	.58
	Female	2	0	
Runoff vessels	1	8	3	.02[a]
	2 or 3	16	0	
Symptomatic	Yes	8	2	.19
	No	16	1	

A Multicentric Experience with Open Surgical Repair and Endovascular Exclusion of Popliteal Artery Aneurysms

R. Pulli [a], W. Dorigo [a,*], P. Castelli [b], V. Dorrucci [c], F. Ferilli [d], G. De Blasis [e], V. Monaca [f], E. Vecchiati [g], A. Benincasa [g], C. Pratesi [a]

European Journal of Vascular and Endovascular Surgery Volume 45 Issue 4 April/2013



Open surgery was preferred in:

symptomatic aneurysms

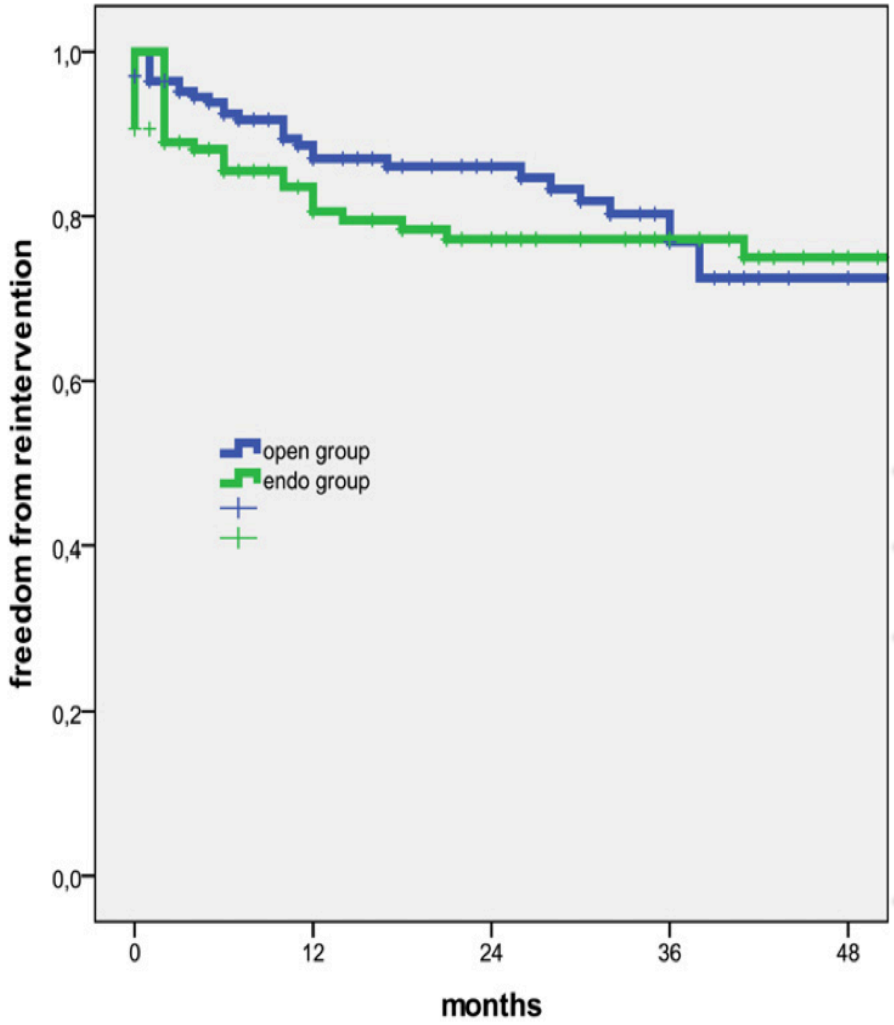
complex anatomical features

presence of acute or limb threatening ischaemia

A Multicentric Experience with Open Surgical Repair and Endovascular Exclusion of Popliteal Artery Aneurysms

R. Pulli [a], W. Dorigo [a,*], P. Castelli [b], V. Dorrucci [c], F. Ferilli [d], G. De Blasis [e], V. Monaca [f], E. Vecchiati [g], A. Benincasa [g], C. Pratesi [a]

European Journal of Vascular and Endovascular Surgery Volume 45 Issue 4 April/2013



	Univariate analysis	
	Log-rank	*p*
Female gender	0.2	0.6
Diabetes	0.7	0.5
Symptomatic PAA	11.3	0.001
Limb-threatening ischaemia	4.6	0.03
Run-off score 0–1	15.2	<0.001
Preoperative thrombolysis	3.1	0.08
Endovascular intervention	0.4	0.6
Adjunctive distal procedure	11.6	0.001

Editor's Choice: Contemporary Treatment of Popliteal Artery Aneurysm in Eight Countries: A Report from the Vascunet Collaboration of Registries

M. Björck [a,*], B. Beiles [b], G. Menyhei [c], I. Thomson [d], P. Wigger [e], M. Venermo [f], E. Laxdal [g], G. Danielsson [h], T. Lees [i], T. Troëng [a,j]

European Journal of Vascular and Endovascular Surgery Volume 47 Issue 2 p. 164–171 February/2014

Country	All repairs	Open repair (*n*)	Endovascular repair (*n*)	Endovascular repair (%)
Australia	441	288	153	34.7
Finland (Helsinki)	58	58	0	0.0
Hungary[a]	103	97	6	5.8
Iceland	6	6	0	0.0
Norway	188	171	17	9.0
New Zealand	93	89	4	4.3
Sweden[a]	495	349	146	29.5
Switzerland	87	87	0	0.0
All	**1,471**	**1,145**	**326**	**22.2**

Stent fractures in the Hemobahn/Viabahn stent graft after endovascular popliteal aneurysm repair

Ignace F.J. Tielliu, MD,[a] Clark J. Zeebregts, MD, PhD,[a] George Vourliotakis, MD,[a] Foppe Bekkema, RN, MaANP,[a] Jan J.A.M. van den Dungen, MD, PhD,[a] Ted R. Prins, MD,[b] and Eric L.G. Verhoeven, MD, PhD,[a] *Groningen, The Netherlands*

MEET 2015
MULTIDISCIPLINARY EUROPEAN ENDOVASCULAR THERAPY

Author	*Year*	*Cases, n*	*Type of stent graft*	*>1 stent graft, n (%)*	*Fracture, n (%)*
Henry[17]	2000	12	Various[a]	No data	—
Howell[2]	2002	13	Wallgraft	5 (38)	—
Gerasimidis[3]	2003	9	Various[b]	4 (44)	—
Mohan[4]	2006	30	Various[c]	No data	—
Rajasinghe[5]	2006	23	Viabahn	No data	—
Curi[6]	2006	15	Viabahn	5 (33)	—
Tielliu[7]	2007	73	Hemo-/Viabahn	53 (73)	3 (4)
Antonello[8]	2007	21	Hemo-/Viabahn	8 (38)	—
Cinà[15]	2008	14	Anaconda	8 (57)	—
Idelchik[9]	2009	33	Various[d]	No data	—
This series[e]	2009	78	Hemo-/Viabahn	57 (73)	13 (17)

CTA, Computed tomographic angiography; *SD*, standard deviation.
[a]Cragg Endopro system (7)/Corvita (3)/noncovered stent (1).
[b]Hemobahn (6)/Wallgraft (2)/Passager (1).
[c]Hemobahn/Viabahn (26)/Passager (2)/Aneurx (1)/PTFE homemade (1).
[d]Wallgraft (15)/Viabahn (44).
[e]This series is an update of an earlier published series.[7]

Stent fractures in the Hemobahn/Viabahn stent graft after endovascular popliteal aneurysm repair

Ignace F.J. Tielliu, MD,[a] Clark J. Zeebregts, MD, PhD,[a] George Vourliotakis, MD,[a] Foppe Bekkema, RN, MaANP,[a] Jan J.A.M. van den Dungen, MD, PhD,[a] Ted R. Prins, MD,[b] and Eric L.G. Verhoeven, MD, PhD,[a] *Groningen, The Netherlands*

Table I. Characteristics of stent grafts with circumferential fracture(s)

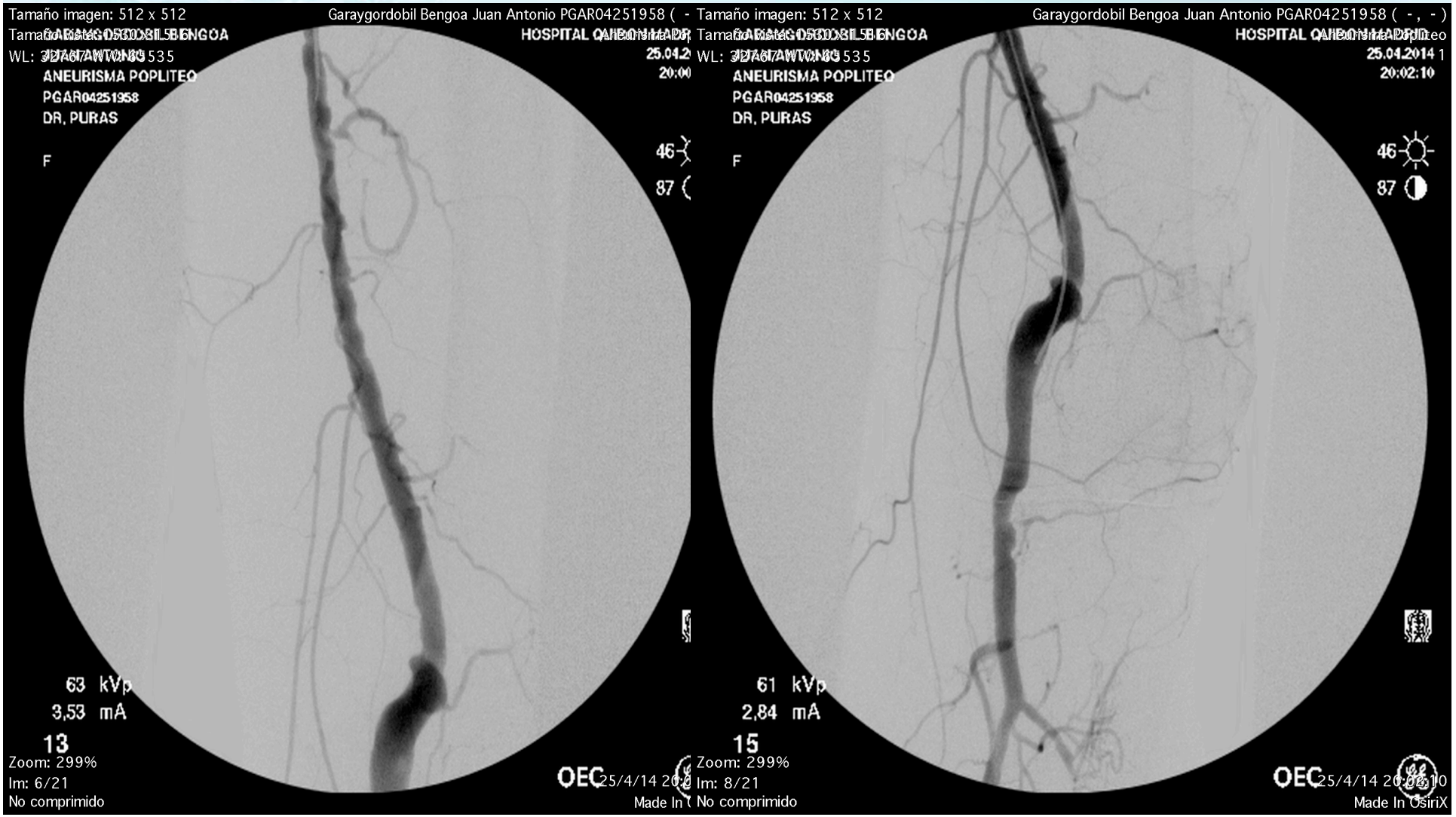
No.	*Stents, (n)*	*Fractures, (n)*	*Fracture spot in relation to*		*Occlusion*	*Treatment*
			Overlap zone	*Adductor tubercle*		
1	2	1	Lower border	At tubercle	Yes	No
2	3	1	Upper border	At tubercle	Yes	No
3	2	1	Lower border	At tubercle	No	—
4	2	1	Lower border	Below tubercle	Yes	Lysis
5	2	1	Lower border	Below tubercle	No	—
6	2	2	Upper border Lower border	Above tubercle At tubercle	No	—
7	2	1	In overlap zone	At tubercle	No	—
8	2	2	In overlap zone Lower border	At tubercle Below tubercle	Yes	Lysis + stent (open)
9	2	1	Upper border	At tubercle	No	—
10	2	1	Upper border	At tubercle	No	—
11	1	1	NA	At tubercle	Yes	Lysis + PTA (reocclusion)
12	2	1	Lower border	At tubercle	No	—
13	2	1	Upper border	At tubercle	No	—

NA, Not applicable; *PTA*, percutaneous transluminal angioplasty.

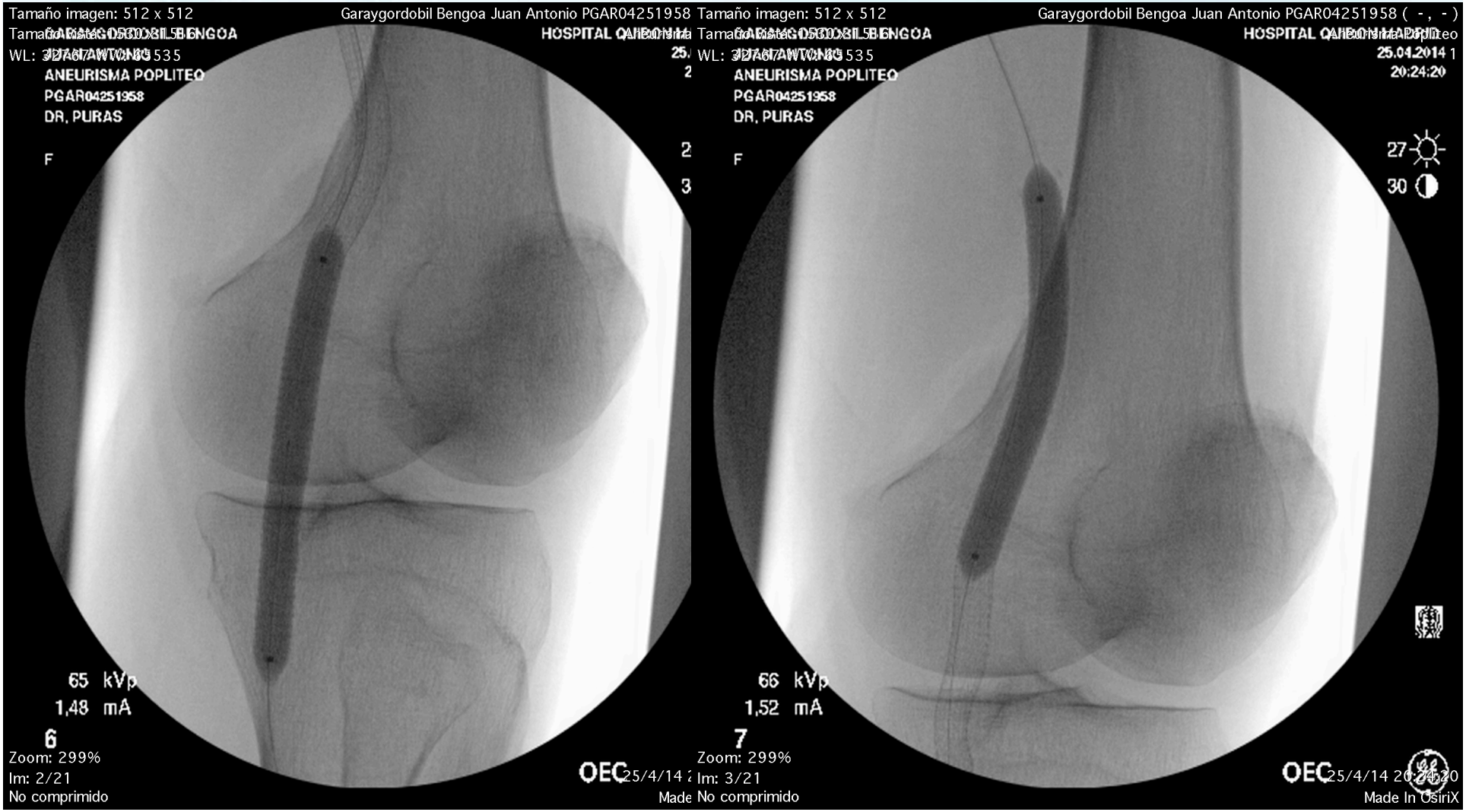
Clinical Indications for popliteal covered endoprosthesis: Aneurysm

Guvendik once called PAA “the sinister harbinger of sudden catastrophe”

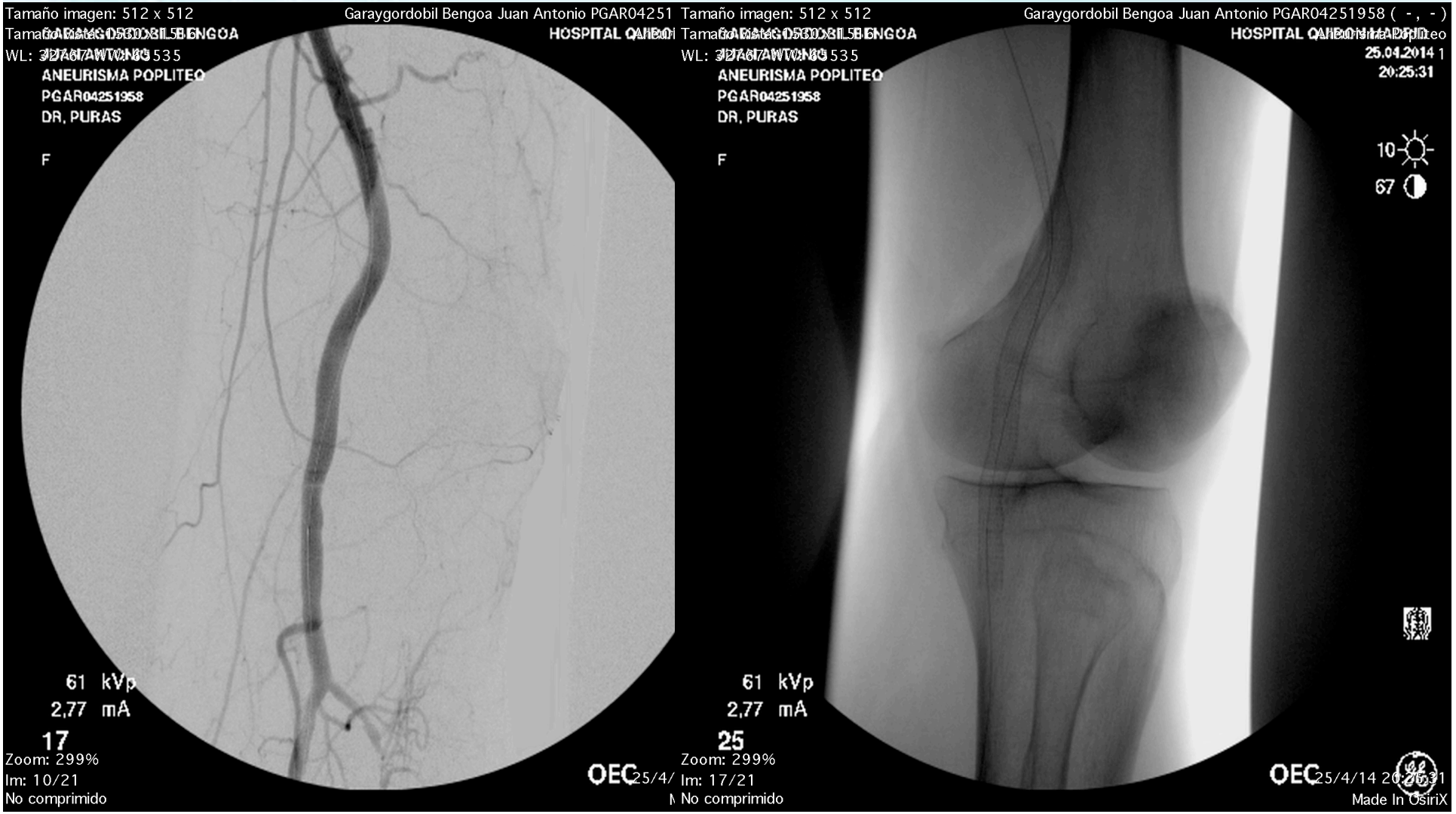
Clinical Indications for popliteal covered endoprosthesis: Aneurysm



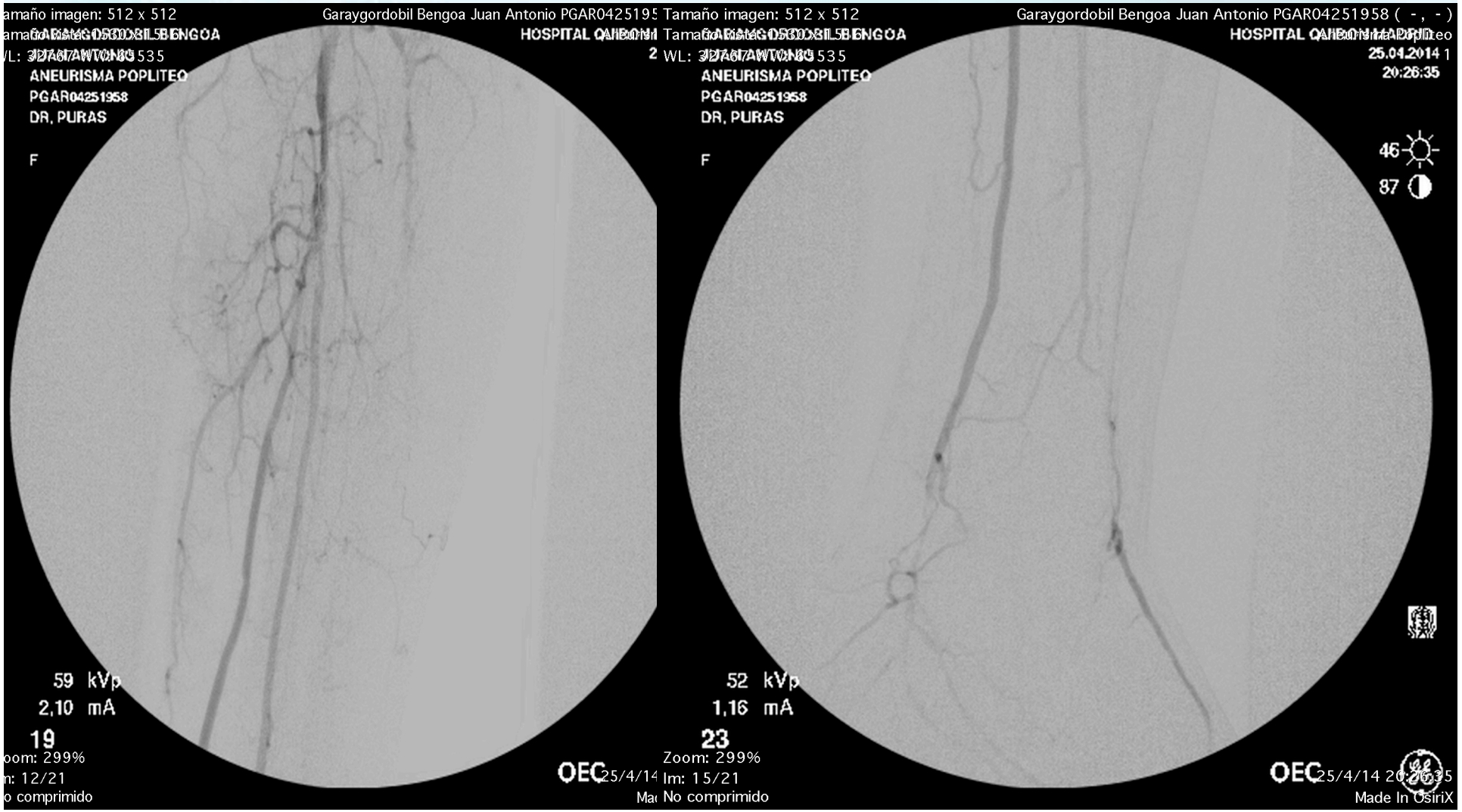
Clinical Indications for popliteal covered endoprosthesis: Aneurysm



Clinical Indications for popliteal covered endoprosthesis: Aneurysm



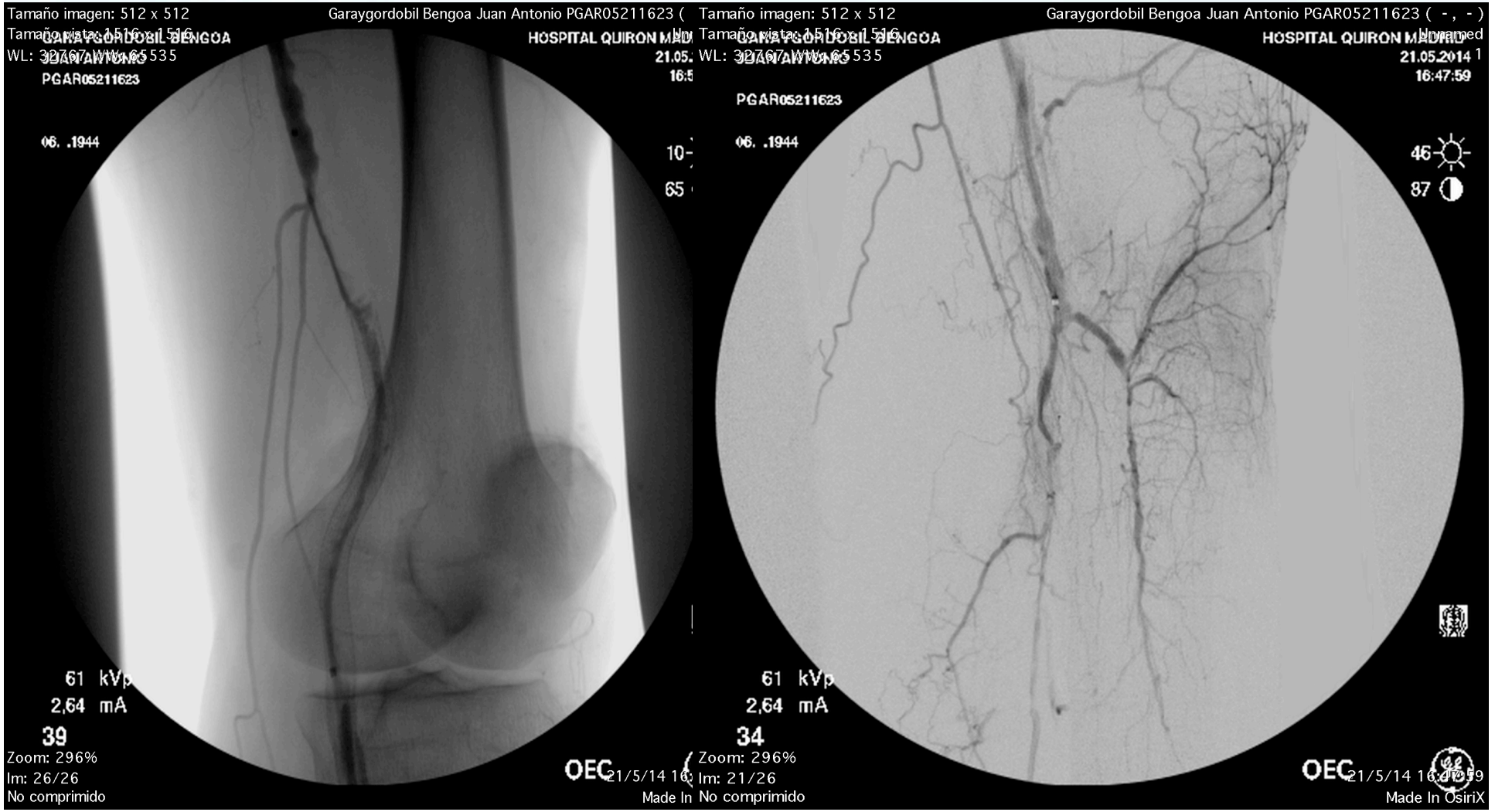
Clinical Indications for popliteal covered endoprosthesis: Aneurysm



45 days later…
Managing complications:
Fibrinolysis

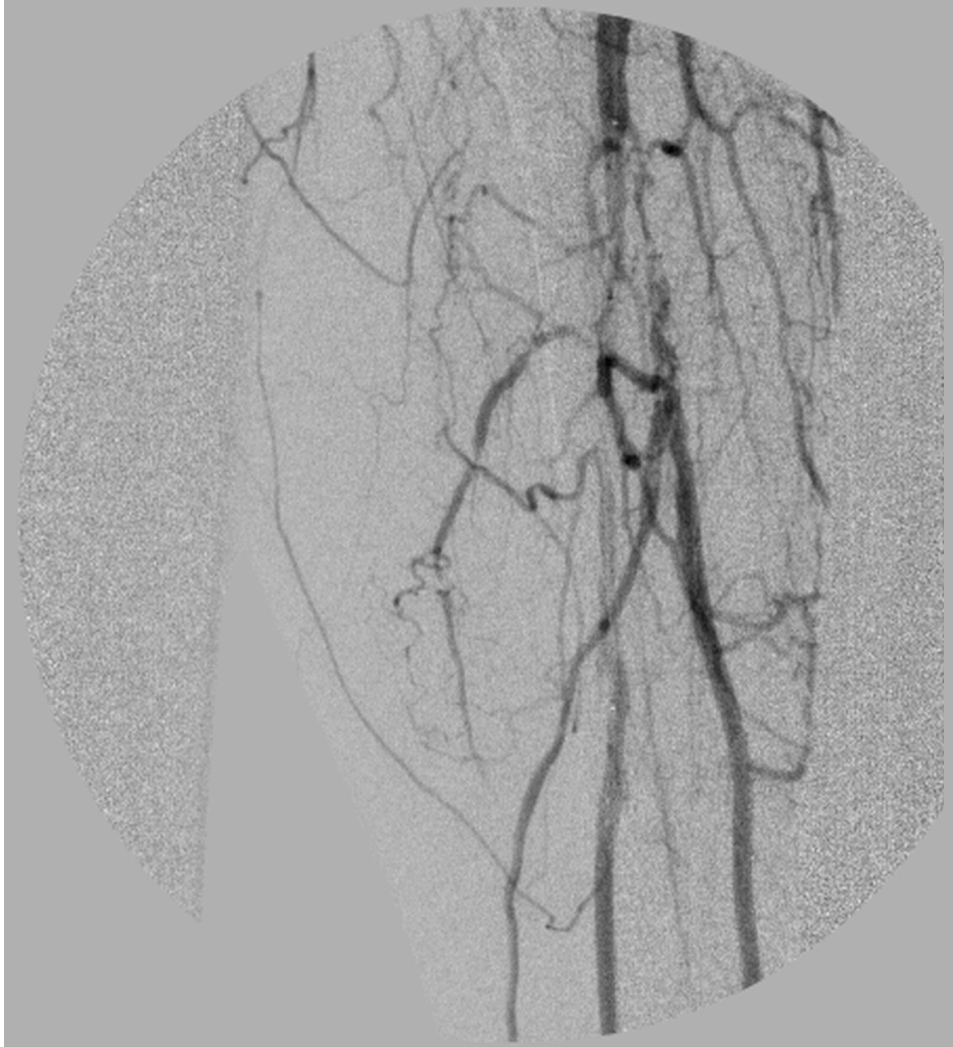
MEET 2015
MULTIDISCIPLINARY EUROPEAN ENDOVASCULAR THERAPY

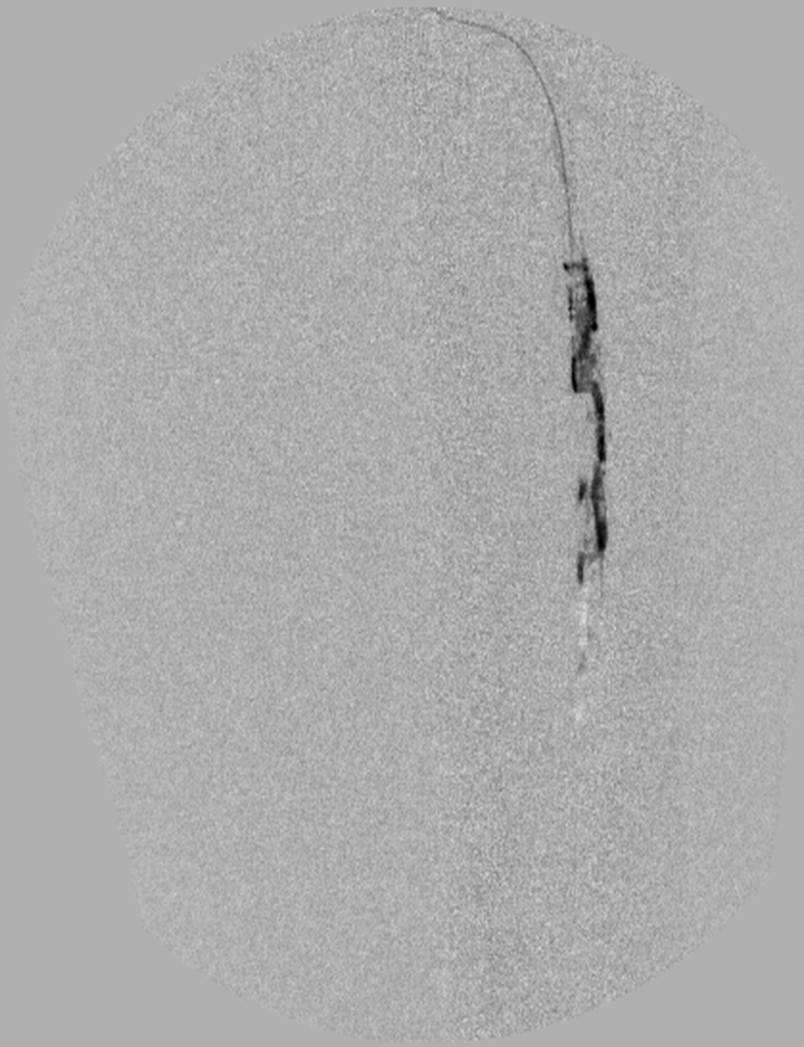
Managing complications: Fibrinolisys



Managing complications: Fibrinolysis

MEET 2015
MULTIDISCIPLINARY EUROPEAN ENDOVASCULAR THERAPY



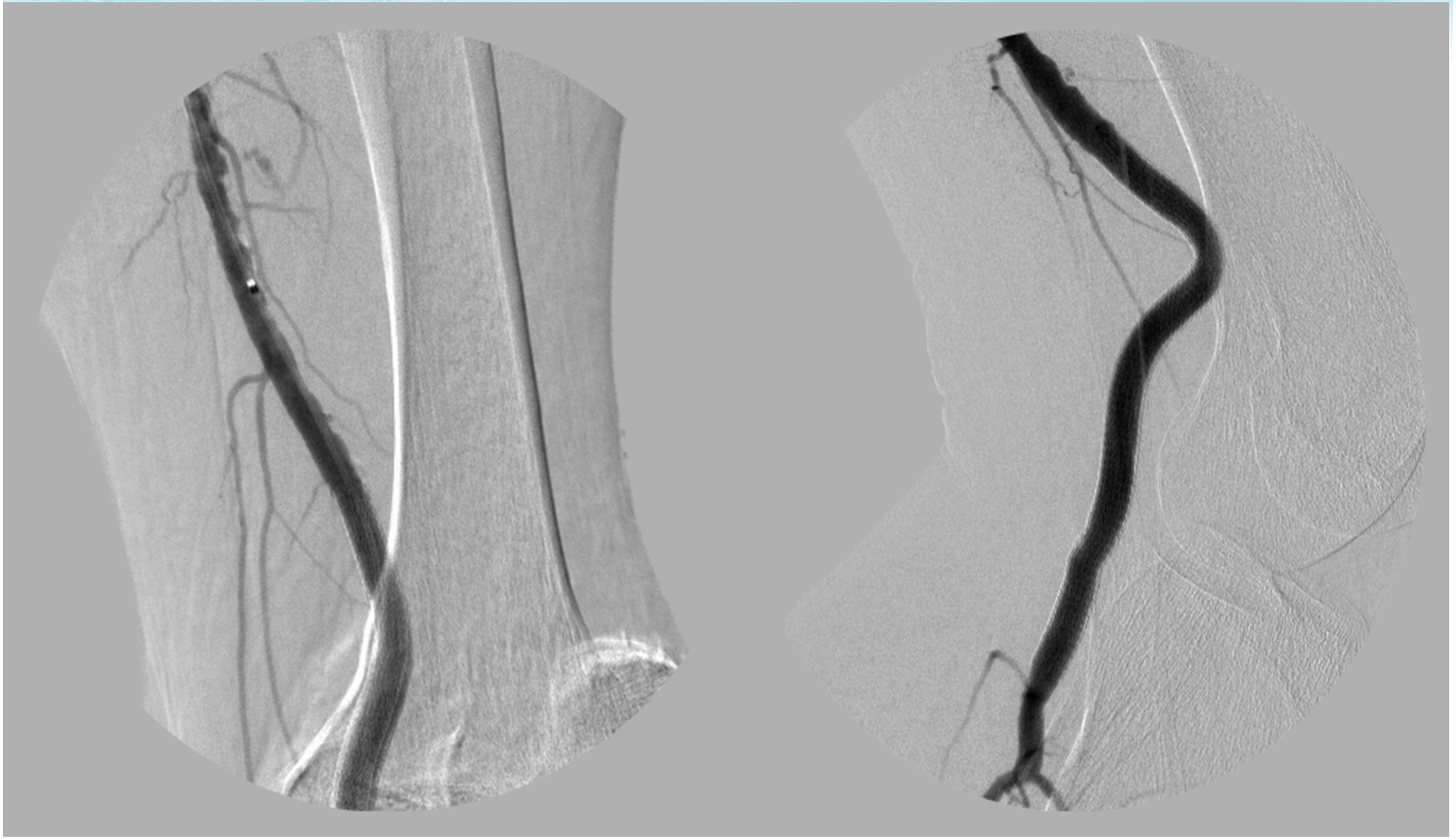


Managing complications: Fibrinolysis

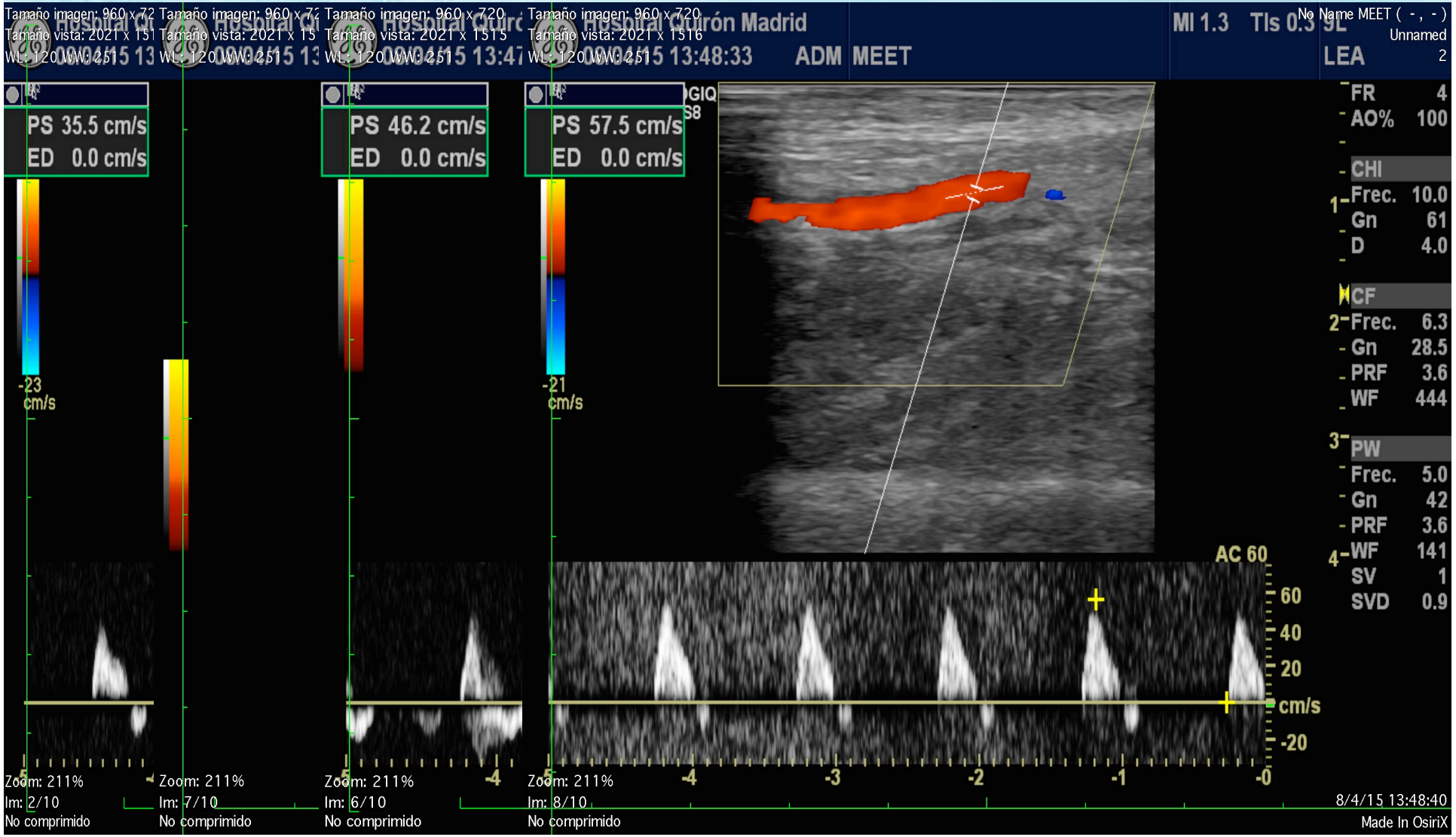
MEET 2015
MULTIDISCIPLINARY EUROPEAN ENDOVASCULAR THERAPY

Managing complications: Fibrinolysis. Results

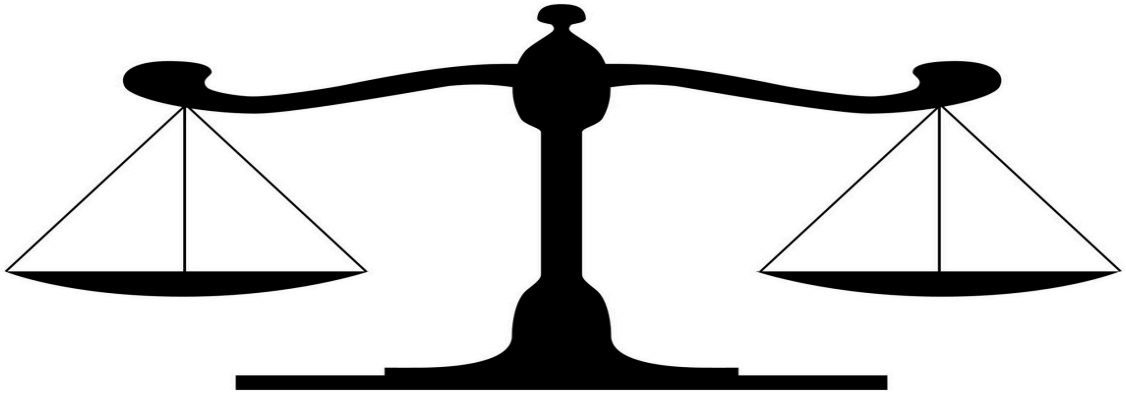
MEET 2015
MULTIDISCIPLINARY EUROPEAN ENDOVASCULAR THERAPY



Covered stent:Duplex follow up



POPLITEAL ARTERY ANEURYSM



EV PRO:

- NO GSV
- EDERLY PTS
- HIGH RISK PTS
- GOOD ANATOMY
- CONCOMITANT TROMBOLYSIS

EV CON

- YOUNG-ACTIVE PTS
- POOR RUNOFF
- > DIAMETER DIF. IN LANDING ZONES
- SEVERE TROMBUS –TORTUSOSITY
- CONTRAINDICATION ANTIPLATELETS

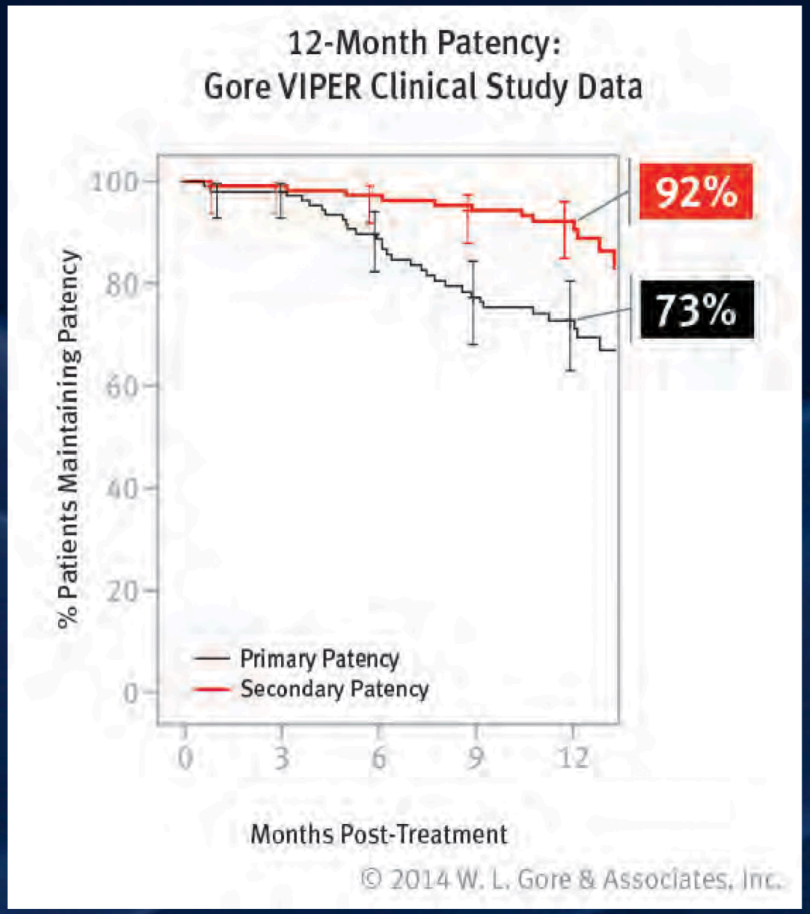
MEET 2015
MULTIDISCIPLINARY EUROPEAN ENDOVASCULAR THERAPY

Author	Journal	Year	No. of Limbs	Lesion Length (cm)	Follow Up (yr)	Primary Patency	Secondary Patency
LENSVELT	Journal of Vascular Surgery, Vol 56, Iss 1, July 2012, P 118-125	2012	56	18,5	1	76%	89%
VIPER	Journal of Vascular Interventional Radiology; 24: 165-173	2012	119	19	1	73%	92%
VIASTAR	Journal of the American College of Cardiology	2013	72	19,4	1	78%	90%
TOTAL weighted results			247	19,0		75%	91%

Gore VIPER Clinical Study Overview

MEET 2015 MULTIDISCIPLINARY EUROPEAN ENDOVASCULAR THERAPY

One-Year Patency



103 / 119 limbs available for follow-up at 12 months

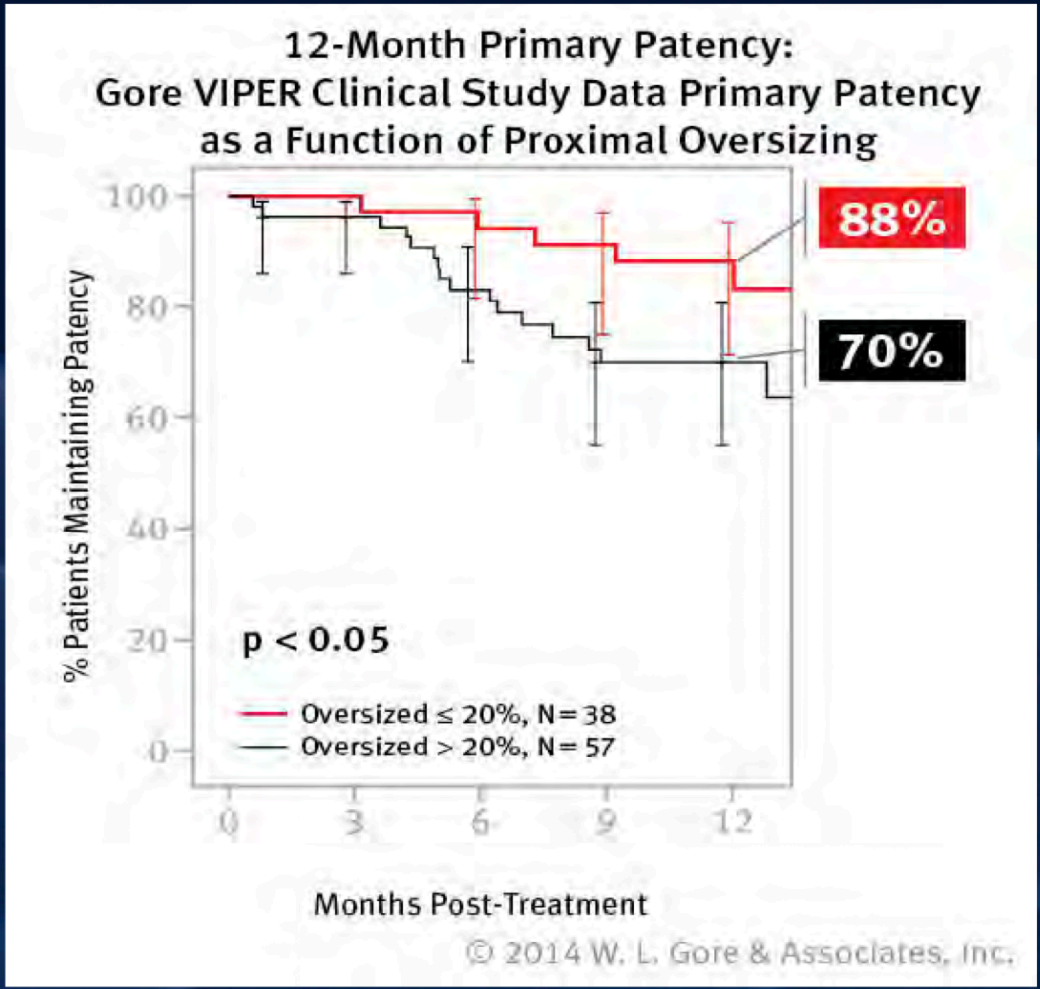
One-Year Primary Patency by Subgroup

	Primary Patency
Overall	73%
Device Diameter	
5 mm (n= 23)	79%
6 mm (n= 85)	69%
7 mm (n= 8)	100%
Lesion Length	
≤ 20 cm (n= 68)	75%
> 20 cm (n= 51)	70%

Gore VIPER Clinical Study Overview

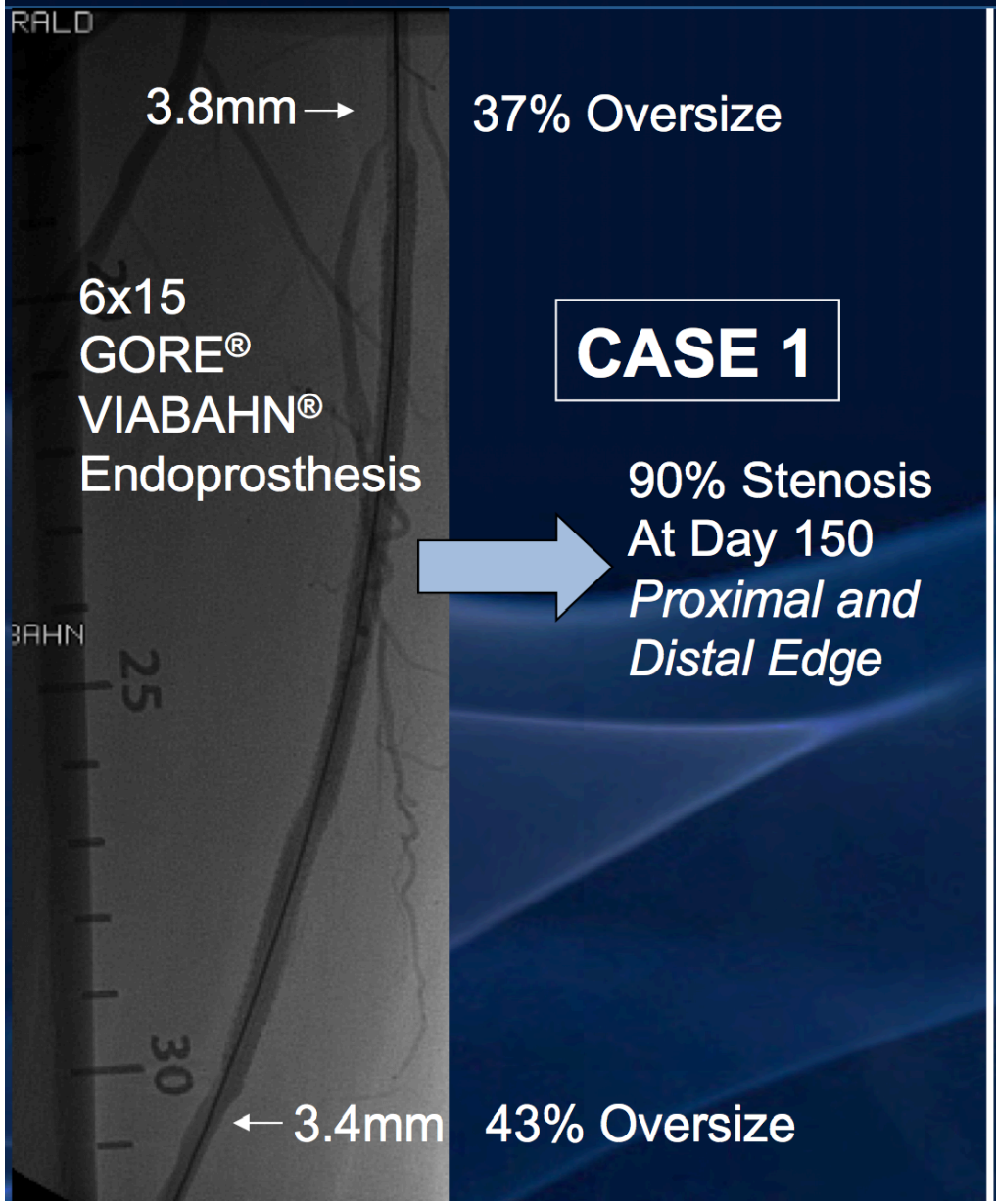
MEET 2015 MULTIDISCIPLINARY EUROPEAN ENDOVASCULAR THERAPY

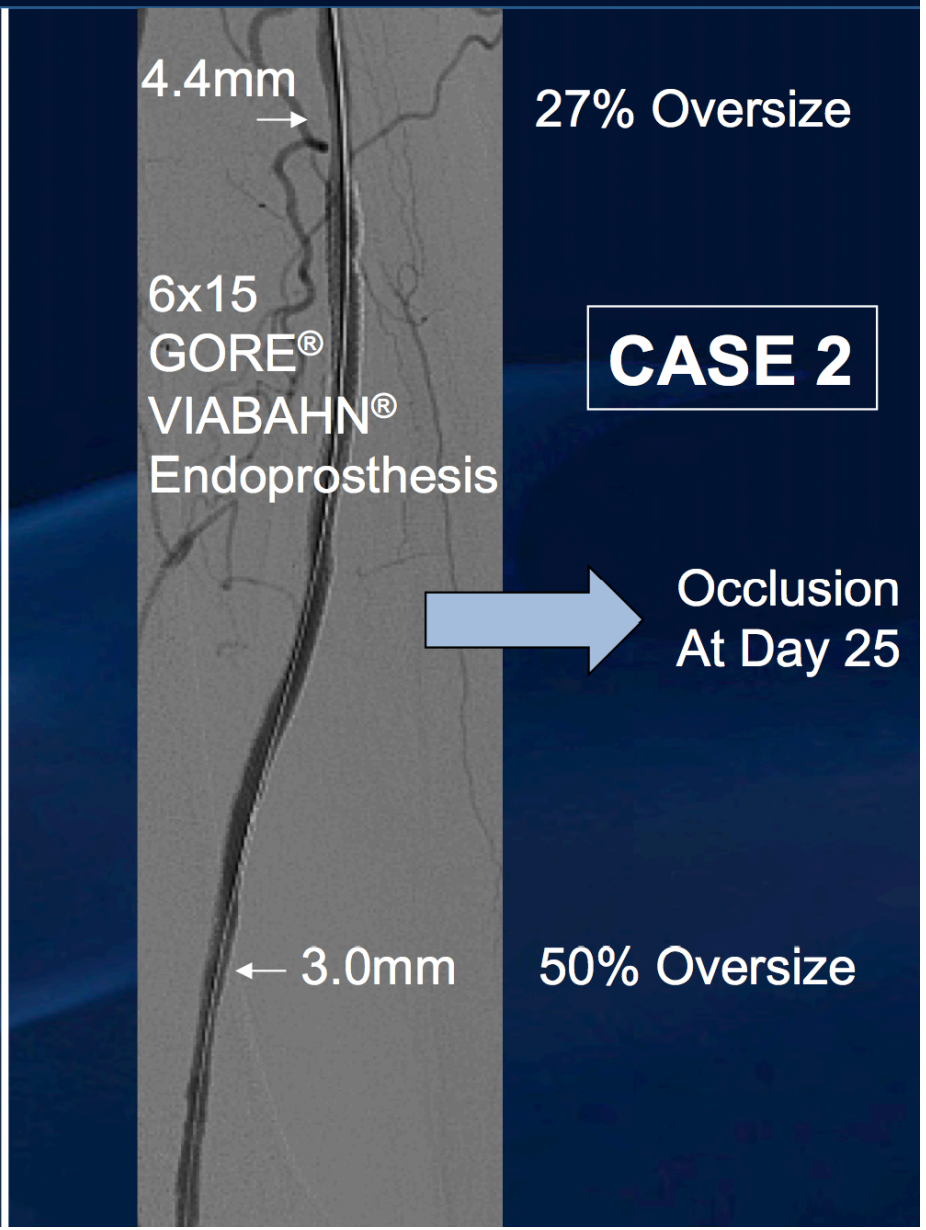
Effects of Device Sizing: Proximal



Gore VIPER Clinical Study Overview

MEET 2015
MULTIDISCIPLINARY EUROPEAN ENDOVASCULAR THERAPY





Compared with a peripheral bypass, an endovascular repair at the popliteal artery has :

MEET 2015 MULTIDISCIPLINARY EUROPEAN ENDOVASCULAR THERAPY

Galiñanes EL et al. Vasc Endovasc Surg 2014;47:267

EV vs OR: REINTERVENTION RATE US MEDICARE POPULATION(2962 PTS)

Thrombolysis	OR	ER	Sign.
30 days	0.25%	0.75%	P=.0002
90 days	1.46%	3.28%	P=.0002
Embolectomy	**OR**	**ER**	**Sign.**
30 days	0.46%	0.75%	P<.0006
90 days	1.82%	2.73%	P<.0002

Treatment methods in covered stent popliteal thrombosis

MEET 2015 MULTIDISCIPLINARY EUROPEAN ENDOVASCULAR THERAPY

- Open surgery: Thrombectomy or bypass
- Different methods of Thrombolisys:

1. Catheter directed
2. Ultrasound enhanced
3. Uk vs rTPA

Then endovascular repair of the problem

- The best treatment…avoid a bad indication!!!!

Conclusions

MEET 2015
MULTIDISCIPLINARY EUROPEAN ENDOVASCULAR THERAPY

1. Patency with new covered stents is independent of lesions length, and diameters of the device in the fem-pop segment

2. In covered stents implants we must not over size more than 10% over the vessel lumer diameter

3. In EV popliteal aneurysm approach, anatomy issues, good outflow and use of antiplatelets are all important in order to obtain excellent results

Conclusions

MEET 2015
MULTIDISCIPLINARY EUROPEAN ENDOVASCULAR THERAPY

- 4. In the treatment of a covered stent popliteal thrombosis an endovascular approach with catheter directed thrombolysis should be the first option

- 5. After thrombolysis an endovascular solution of the outflow problem should be preformed

- 6. A conservative approach of some covered stent thrombosis can be prescribed if the patient (old, comorbidity…….), remains with moderate clinical manifestations