Intervención Percutánea en Puentes de Vena Safena

Dr. Francisco Garrido Bernier
Cardiólogo Hemodinamista e
Intervencionista Endovascular Periférico
Clínica Saludcoop Medellín

Cuál es el problema?

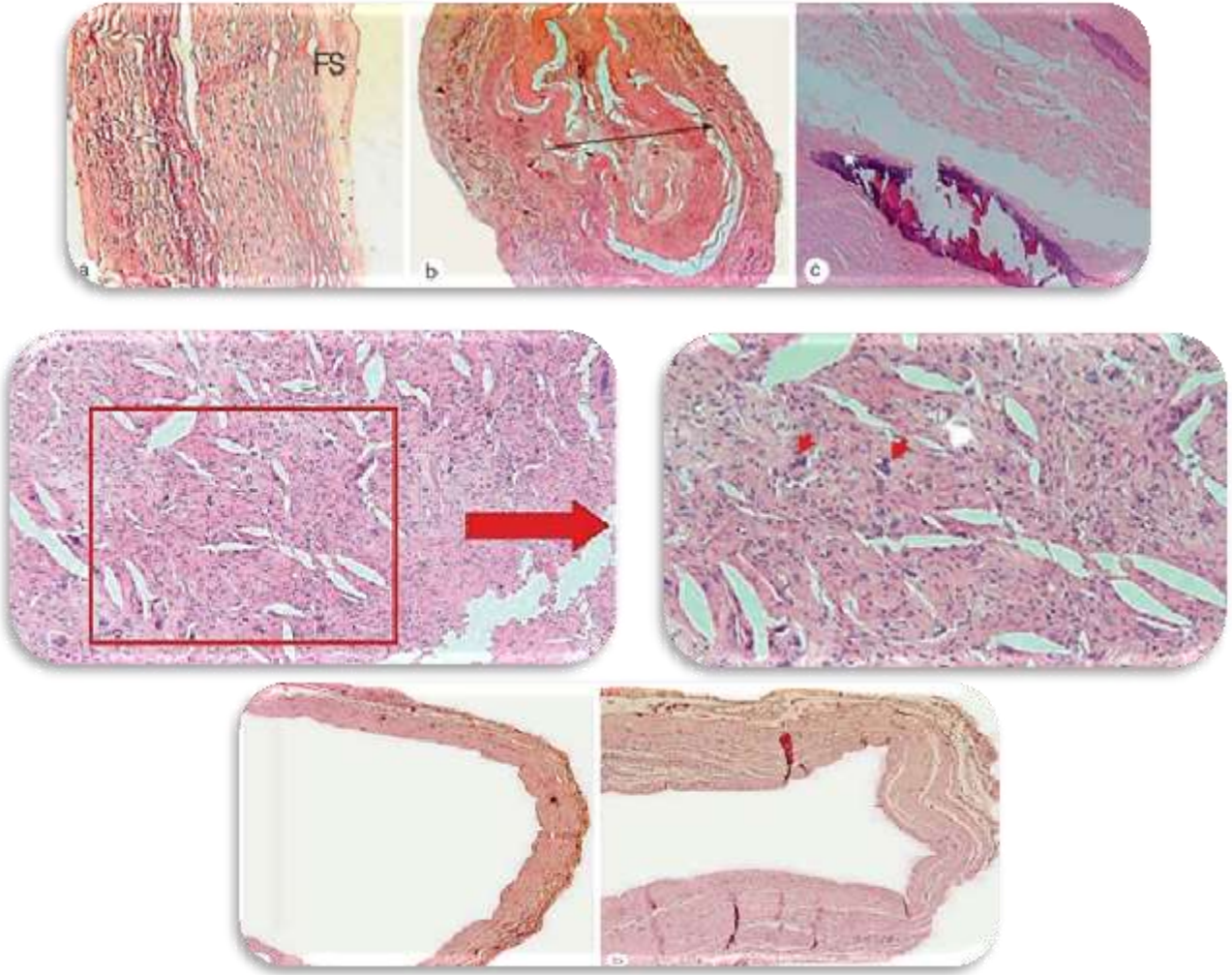
- 70% de los puentes son SVG.[1]
- 50% de SVG ocluidos a un año.[2]
- PCI a SVG son el 6% de todas las PCI.[3]
- A 1 año el 30% de CABG tienen angina.[3]
- 70%-80% de STEMI en CABG son en SVG.[2]

1. *Murphy GJ, Angelini GD. Insights into the pathogenesis of vein graft disease: lessons from intravascular ultrasound. Cardiovasc Ultrasound. 2004;2:8.*

2. *One-year coronary bypass graft patency: a randomized comparison between off-pump and on-pump surgery angiographic results of the PRAGUE-4 trial.Circulation. 2004 Nov 30 ;110(22):3418-23. Epub 2004 Nov 22 .*

3. *Brilakis ES, Rao SV, Banerjee S, et al. Percutaneous coronary intervention in native arteries versus by- pass grafts in prior coronary artery bypass grafting patients a report from the national cardiovascular data registry. JACC Cardiovasc Interv. 2011;4:844– 50*

Biología de los SVG



Bikdeli B, Hassantas SA, Pourabdollah M, Kalantarian S, Sadeghian M, Afshar H, et al. Histopathologic Insight to Saphenous Vein Bypass Graft Disease. Cardiology. 2012; 123: 208-215.

Mecanismo de la lesión en SVG

- Lesión POP temprana. (Menos de 1 mes)
  - Trombosis (60%)

- Lesión POP tardía. (1 mes a 1 años)
  - Hiperplasia Fibrointimal.

- Lesión POP muy tardía. (Más de 1 año)
  - Nueva placa aterosclerótica

R. *Ernesto Oqueli (2012). Percutaneous Intervention Post Coronary Artery Graft Surgery in Patients with Saphenous Vein Graft Disease – State of the Art, Coronary Interventions,.*

Por qué no ReDo?

- Teóricamente:[1]
  - Fallo multiconductos.
  - Buenos lechos distales en los vasos nativos.
  - Disponibilidad de conductos venosos.
  - Fallo de PCI en vasos nativos.
- Sin embargo:[2]
  - Riesgo Qx mayor que el beneficio clínico.
  - Lesión de la LIMA.
  - Eventos clínicos posteriores son similares.

1. Levine GN, Bates ER, Blankenship JC, et al. 2011 ACCF/AHA/SCAI Guideline for Percutaneous Coro nary Intervention. J Am Coll Cardiol. 2011;58:e44–122

2. Morrison DA, Sethi G, Sacks J, et al. Percutaneous coronary intervention versus repeat bypass surgery for patients with medically refractory myocardial is- chemia: AWESOME randomized trial and registry experience with post-CABG patients. J Am Coll Cardiol. 2002;40:1951–4

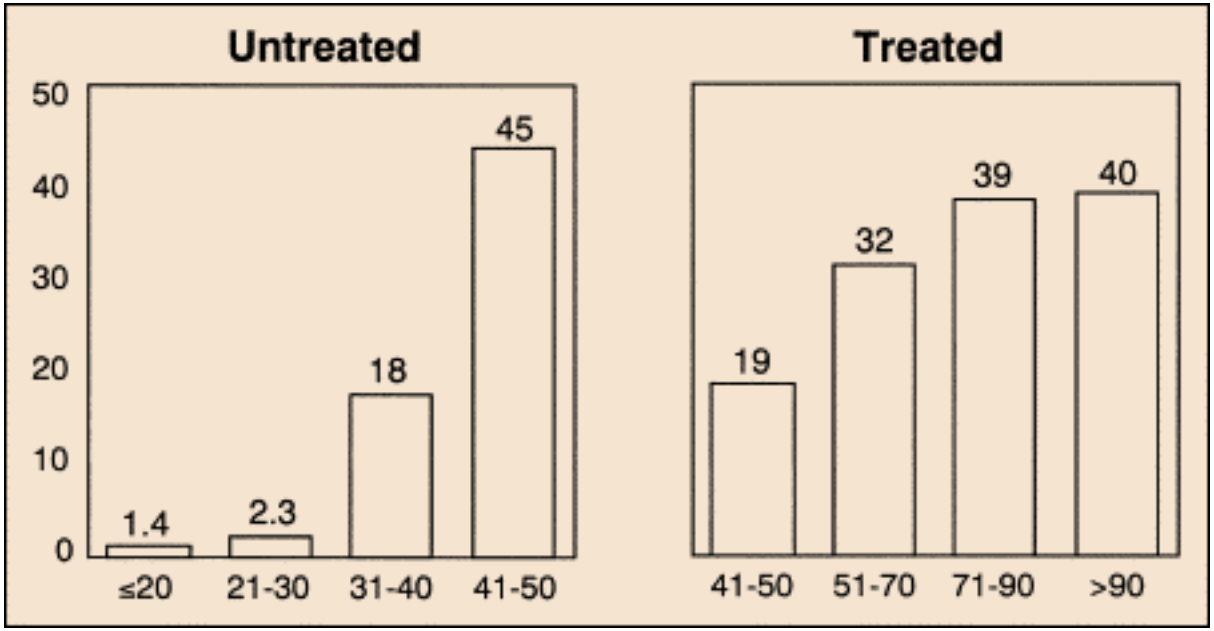
A quién se interviene?

- FFR
  - Similar a vasos a nativos.
  - El sensor en 2/3 distales del vaso nativo.
  - Diferenciar focal o difusa.
  - 0,75-0,80.
- IVUS
  - No hay validación en estudios.
  - Útil para pronóstico de no reflujo

Lesiones intermedias

- IVUS no sirve.
- FFR no está validada.
- SOS Trial
- VELETI Trial
- VELTI II Trial.

Lesiones intermedias



Riesgo de muerte, infarto o TLR durante el seguimineto a un año para lesiones no tratadas (izquierda) y lesiones tratadas (derecha) dividida en subgrupos por porcentaje inicial de estenosis.[1]

1. Stephen G. Ellis , Sorin J. Brener , Sue DeLuca , E.Murat Tuzcu , Russell E. Raymond , Patrick L. Whitlow , Eric J... Late Myocardial Ischemic Events After Saphenous Vein Graft Intervention—Importance of Initially "Nonsignificant" Vein Graft Lesions. The American Journal of Cardiology, Volume 79, Issue 11, 1997, 1460 - 1464

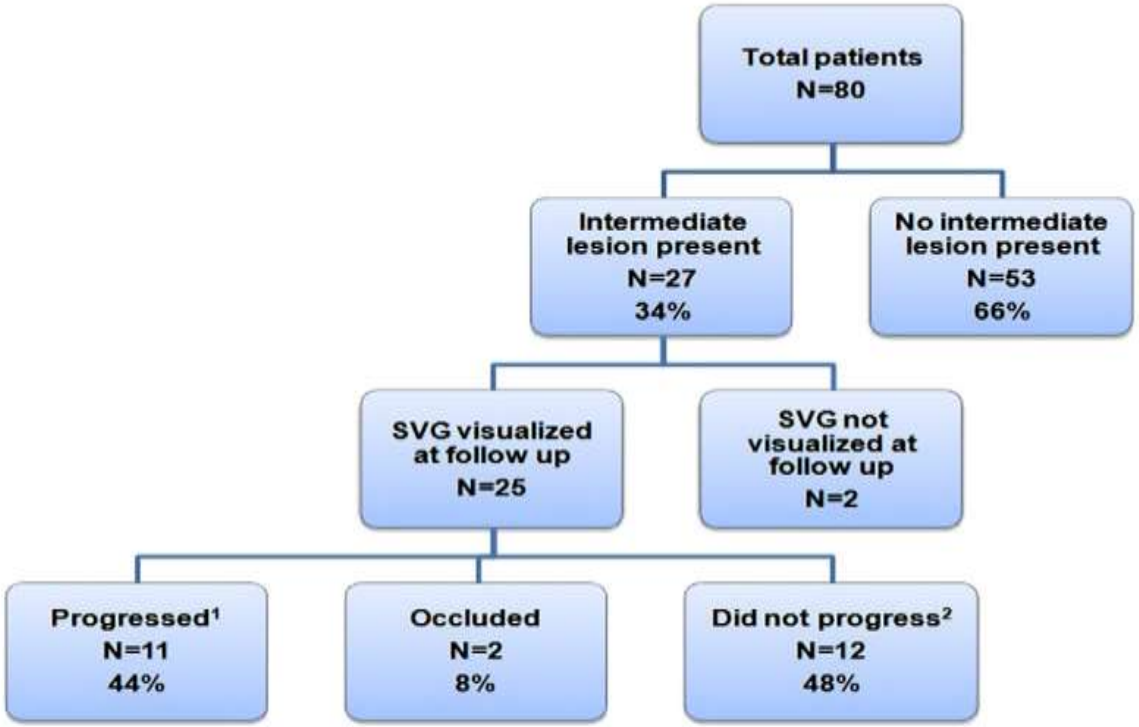
Contents lists available at ScienceDirect

International Journal of Cardiology

journal homepage: www.elsevier.com/locate/ijcard

Prevalence and outcomes of intermediate saphenous vein graft lesions: Findings from the stenting of saphenous vein grafts randomized-controlled trial

Abdul-rahman R. Abdel-karim [a,b], Monica Da Silva [a,b], Christopher Lichtenwalter [c], James A. de Lemos [a,b],



1. Abdel Karim, AR, Da Silva M, et al. Prevalence and outcomes of intermediate saphenous vein graft lesions: findings from the stenting of saphenous vein grafts randomized-controlled trial. Int J Cardio, 2013 Oct 3;168(3):2468-73

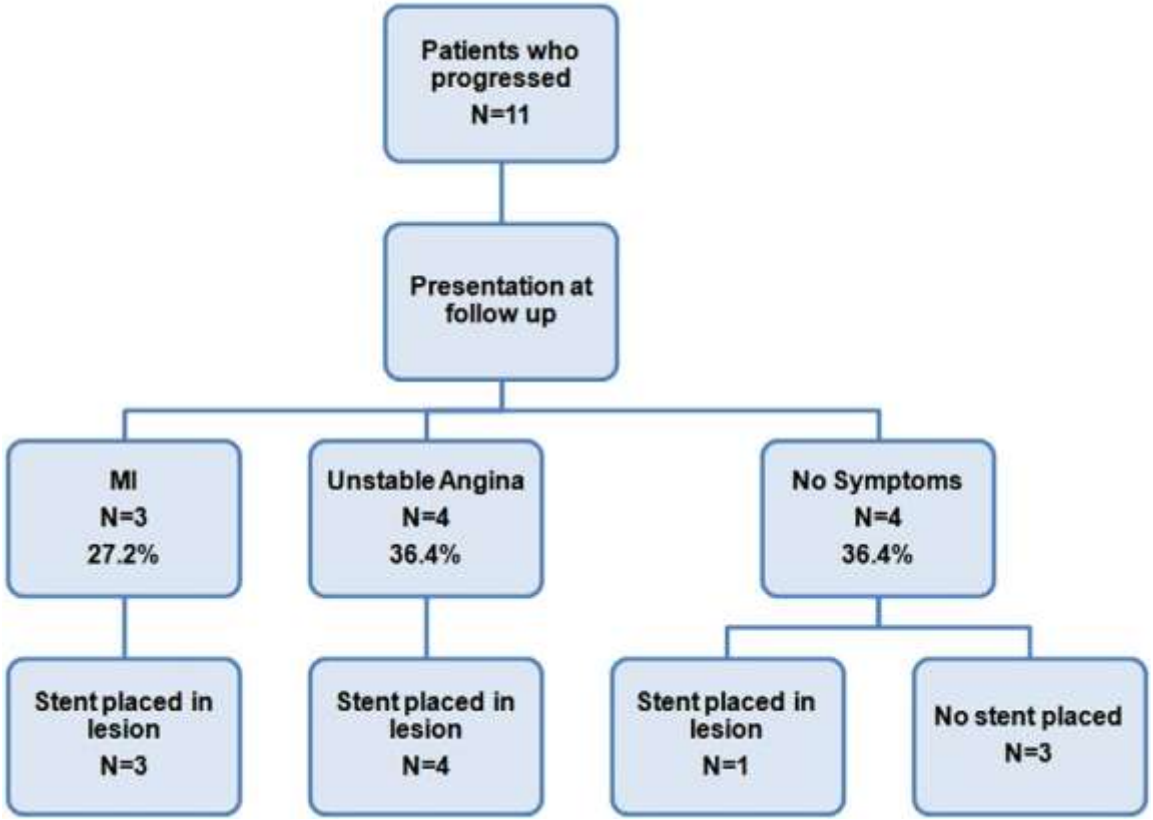
Contents lists available at ScienceDirect

International Journal of Cardiology

journal homepage: www.elsevier.com/locate/ijcard

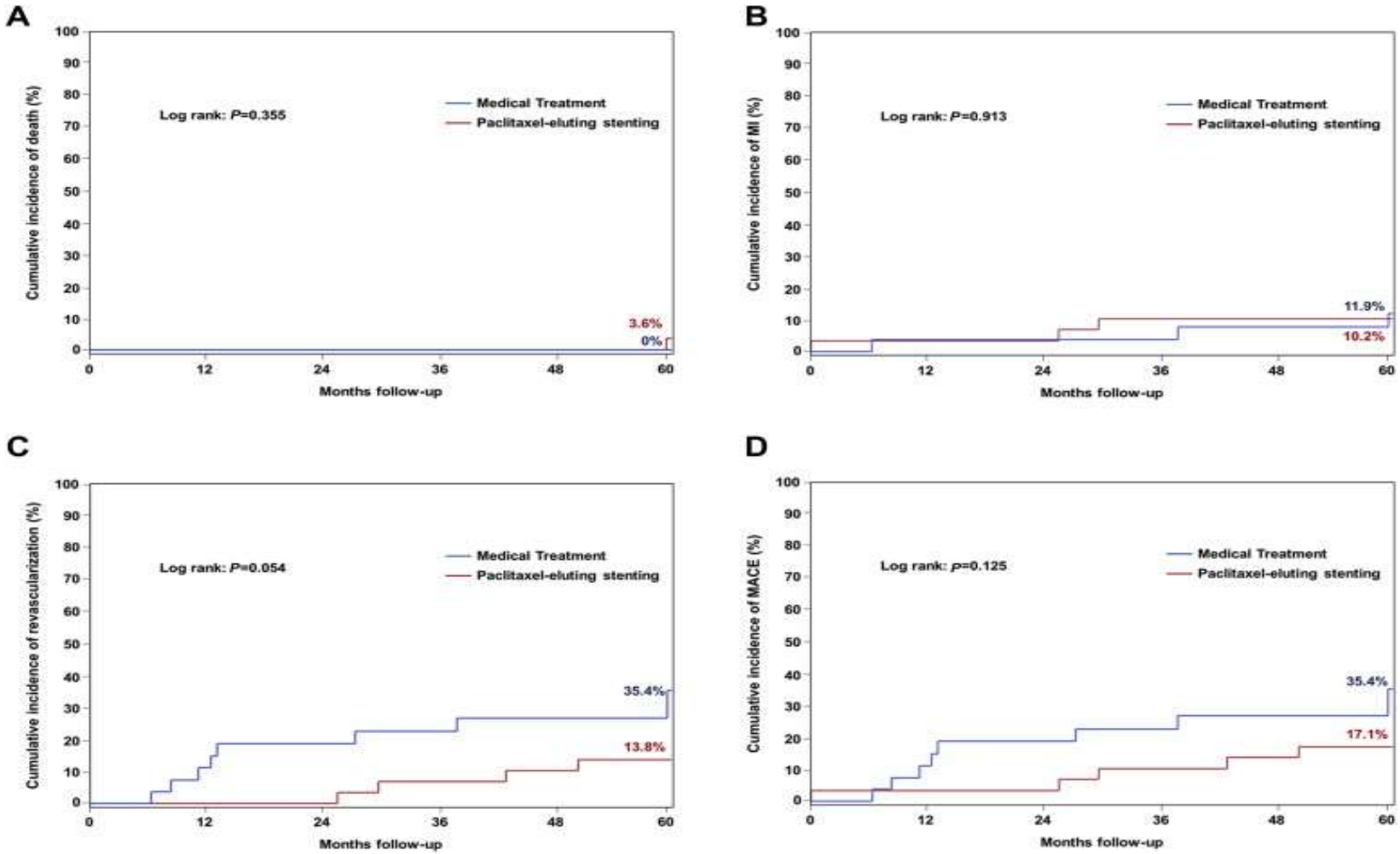
Prevalence and outcomes of intermediate saphenous vein graft lesions: Findings from the stenting of saphenous vein grafts randomized-controlled trial

Abdul-rahman R. Abdel-karim [a,b], Monica Da Silva [a,b], Christopher Lichtenwalter [c], James A. de Lemos [a,b],



1. Abdel Karim, AR, Da Silva M, et al. Prevalence and outcomes of intermediate saphenous vein graft lesions: findings from the stenting of saphenous vein grafts randomized-controlled trial. Int J Cardio, 2013 Oct 3;168(3):2468-73

VELETI Trial



1. Josep Rodés-Cabau , Olivier F. Bertrand , Eric Larose , Jean-Pierre Déry , Stéphane Rinfret , Marina Urena . Five-Year Follow-up of the Plaque Sealing With Paclitaxel-Eluting Stents vs Medical Therapy for the Treatment of Intermediate Nonobstructive Saphenous Vein Graft Lesions (VELETI) Trial. Canadian Journal of Cardiology, Volume 30, Issue 1, 2014, 138 - 145

Cambiamos los dogmas?

ClinicalTrials.gov
A service of the U.S. National Institutes of Health

Example: "Heart attack" AND "Los Angeles"
Search for studies: Search
Advanced Search | Help | Studies by Topic | Glossary

Find Studies | About Clinical Studies | Submit Studies | Resources | About This Site

Home > Find Studies > Study Record Detail
Text Size

Sealing Moderate Coronary Saphenous VEin Graft Lesions With Paclitaxel-Eluting Stents (VELETI II)

This study is ongoing, but not recruiting participants.

Sponsor:
Centre de Recherche de l'Institut Universitaire de Cardiologie et de Pneumologie de Quebec

Collaborators:
Boston Scientific Corporation
CANNeCTIN

Information provided by (Responsible Party):
Josep Rodes-Cabau, Centre de Recherche de l'Institut Universitaire de Cardiologie et de Pneumologie de Quebec

ClinicalTrials.gov Identifier:
NCT01223443

First received: October 18, 2010
Last updated: May 13, 2014
Last verified: February 2014
History of Changes

Puentes Ocluidos Crónicamente

Clinical and Angiographic Outcomes After Percutaneous Recanalization of Chronic Total Saphenous Vein Graft Occlusion Using Modern Techniques

Rasha Al-Lamee, MA, MRCP[a,b,c], Alfonso Ielasi, MD[a], Azeem Latib, MD[a,b], Cosmo Godino, MD[a,b], Massimo Ferraro[b], Francesco Arioli, MD[a], Marco Mussardo, MD[a], Daniela Piraino, MD[a], Filippo Figini, MD[a], Mauro Carlino, MD[a], Matteo Montorfano, MD[a], Alaide Chieffo, MD[a], and Antonio Colombo, MD[a,b,*]

1. Al-Lamee R, Ielasi A, Latib A, et al. Clinical and angiographic outcomes after percutaneous recanalization of chronic total saphenous vein graft occlusion using modern techniques. Am J Cardiol 2010;106:1721–7.

Conclusiones?

- Tasa primaria de éxito: 68%.
- Reestenosis a 18 meses: 68%
- TLR: 61%.
- Ruptura del vaso: 7%.
- Promedio de stent: 3,6
- Promedio medio de contraste: 368 ml
- Promedio de fluroscopia: 78 minutos
- Tiempo de promedio de procedimiento: 123 minutos.
- En el segumiento igual tasa de angina y muerte.

1. Al-Lamee R, Ielasi A, Latib A, et al. Clinical and angiographic outcomes after percutaneous recanalization of chronic total saphenous vein graft occlusion using modern techniques. Am J Cardiol 2010;106:1721–7.

Intervención en SVG
Puntos a debatir

Terapia antiplaquetaria y antitrombina

- Inhibidores de GP IIB/IIIA
- Bivalirudina.

Técnica de intervención

- Predilatar vs Stent directo
- Stent de menor tamaño
- Uso de DPD

Tipo de Stent

- BMS
- Stent cubierto
- DES

Manejo del No-Reflujo

Antitrombina y Antiplaquetario

- Los inhibidores de GP IIB/IIIa en PCI de SVG en varios estudios no han demostrado beneficio.[1-2]
- Sólo un estudio demostró menor No-Reflujo, pero con MACE similar a un mes.[3]
- Bivalirudina muesta una tasa menor de elevación de CPK MB con menos tasa de sangrado.

1. Mak KH, Challapalli R, Eisenberg MJ, Anderson KM, Califf RM, Topol EJ. Effect of platelet glycoprotein IIb/IIIa receptor inhibition on distal embolization during percutaneous revascularization of aortocoro- nary saphenous vein grafts. EPIC Investigators. Evaluation of IIb/IIIa platelet receptor antagonist 7E3 in Preventing ischemic Complications. Am J Cardiol 1997;80:985–8.

2. Roffi M, Mukherjee D, Chew DP, et al. Lack of benefit from intravenous platelet glycoprotein IIb/IIIa receptor inhibition as adjunc- tive treatment for percutaneous interventions of aortocoronary bypass grafts: a pooled analysis of five randomized clinical trials. Circulation 2002;106:3063–7.

3. Jonas M, Stone GW, Mehran R, et al. Platelet glycoprotein IIb/IIIa receptor inhibition as adjunctive treatment during saphenous vein graft stenting: differential effects after randomization to occlusion or filter- based embolic protection. Eur Heart J 2006;27:920–8.

Ensayos clínicos sobre stent en SVG

Study	Year	n	Primary endpoint	Bare metal stent event rate (%)	Other group event rate (%)	*P*
BMS vs balloon angioplasty						
SAVED [39]	1997	220	6-month angiographic restenosis	37	46	0.24
Venestent [40]	2003	150	6-month angiographic restenosis	19.1	32.8	0.069
BMS vs covered stents						
RECOVERS [41]	2003	301	6-month angiographic restenosis	24.8	24.2	0.237
STING [42]	2003	211	6-month angiographic restenosis	20	29	0.15
SYMBIOT III [43]	2006	700	8-month angiographic percent diameter stenosis	30.9	31.9	0.80
BARRICADE [44]	2011	243	8-month angiographic restenosis	28.4	31.8	0.63
BMS vs. DES						
RRISC	2006 (45)	75	6-month restenosis	32.6	13.6	0.031
	2007 (46)		MACE at 32 months	41	58	0.13
SOS	2009 (47)	80	12-month angiographic restenosis	51	9	<0.001
	2010 (48)	80	Target vessel failure at 35 months	72	34	0.001
ISAR-CABG [49••]	2011	610	12-month composite of death, MI, and TLR	22	15	0.02

BMS Vs Stent cubierto

	SYMBIOT III (1)			BARRICADE (2)			RECOVERS		
	PTFE	BMS	p Value	PTFE	BMS	p Value	PTFE	BMS	p Value
MACE									
1 yr	30.6	26.6	0.43	39.2*	28.0*	0.07	23.1†	15.9†	0.15
3 yrs	NA	NA	NA	60.2	37.0	0.001	NA	NA	NA
5 yrs	NA	NA	NA	68.3	51.8	0.007	NA	NA	NA
Death									
1 yr	2.6‡	4.7‡	0.29	7.0	5.0	0.51	2.6†	2.8†	0.92
3 yrs	NA	NA	NA	18.8	11.2	0.13	NA	NA	NA
5 yrs	NA	NA	NA	29.8	22.3	0.20	NA	NA	NA
MI									
1 yr	9.2	10.9	0.61	14.2	11.3	0.53	14.1†	5.5†	0.02
3 yrs	NA	NA	NA	21.0	14.1	0.21	NA	NA	NA
5 yrs	NA	NA	NA	26.2	17.4	0.16	NA	NA	NA
TLR									
1 yr	23.5	15.6	0.06	28.2	21.1	0.46	9.6†	8.3†	0.84
3 yrs	NA	NA	NA	37.4	21.8	0.02	NA	NA	NA
5 yrs	NA	NA	NA	43.9	29.6	0.04	NA	NA	NA

1.Turco MA, Buchbinder M, Popma JJ, et al. Pivotal, randomized U.S. study of the Symbiot covered stent system in patients with saphenous vein graft disease: eight-month angiographic and clinical results from the Symbiot III trial. Catheter Cardiovasc Interv .2.2006;68:379 – 88..

2. Stone GW, Goldberg S, O'Shaughnessy C, et al. Five-year follow-up of polytetrafluoroethylene covered stents compared with bare-metal stents in aortocoronary saphenous vein graft: the randomized BARRICADE (Barrier Approach to Restenosis: Restrict Intima to Curtail Adverse Events) Trial. J Am Coll Cardiol Intv 2011;4:300–9.

BMS vs DES

© 2007 by the American College of Cardiology Foundation

EXPEDITED REVIEW

Increased Late Mortality After Sirolimus-Eluting Stents Versus Bare-Metal Stents in Diseased Saphenous Vein Grafts

Results From the Randomized DELAYED RRISC Trial

Conclusions: In this secondary post-hoc analysis, BMS were associated with lower long-term mortality than SES for SVG disease. Also, the 6-month reduction in repeated revascularization procedures with SES was lost at longer-term follow-up. (RRISC Study: Reduction of Restenosis In Saphenous Vein Grafts With Cypher Sirolimus-Eluting Stent;

BMS vs DES

J Am Coll Cardiol Intv, 2011; 4:176-182, doi:10.1016/j.jcin.2010.10.003
© 2011 by the American College of Cardiology Foundation

Clinical Research

Continued Benefit From Paclitaxel-Eluting Compared With Bare-Metal Stent Implantation in Saphenous Vein Graft Lesions During Long-Term Follow-Up of the SOS (Stenting of Saphenous Vein Grafts) Trial

Conclusions: During long-term follow-up, use of PES was associated with significantly better clinical outcomes than BMS in SVG lesions. (Stenting of Saphenous Vein Grafts Trial [SOS];

BMS vs DES

ISAR CABG

Its Drug-Eluting Stenting Associated With Improved Results in Coronary Artery Bypass Graft

- Compra la eficacia de DES y BMS en reducir restenosis.
- 610 paciente con >1 lesión en un SVG
- DES: Paclitaxel, Sirolimus, Bioabsorvible.
- Desenlace: Muerte, IM, TLR.
- Seguimiento de un año.

BMS vs DES

Drug-Eluting vs. Bare-Metal Stents in Saphenous Vein Graft (SVG) Lesions

ISAR-CABG: Randomized, superiority trial in 610 pts.

1-Year Follow-up	DES (n = 303)	BMS (n = 307)	*P* Value
Death/MI/TLR (Primary Outcome)	15.0%	22.1%	0.02
TLR	6.8%	13.1%	0.01
Stent Thrombosis	0.7%	0.7%	0.99

DES reduced angiographic restenosis at 7 months (15% vs. 29%; $P < 0.0001$).

R&M Solutions
www.rmsolutions.net

Ensayos en curso sobre BMS vs DES

ClinicalTrials.gov
A service of the U.S. National Institutes of Health

Example: "Heart attack" AND "Los Angeles"
Search for studies: Search
Advanced Search | Help | Studies by Topic | Glossary

Find Studies | About Clinical Studies | Submit Studies | Resources | About This Site

Home > Find Studies > Study Record Detail
Text Size

Study to Test the Efficacy and Safety of Drug Eluting vs. Bare-Metal Stents for Saphenous Vein Graft Interventions (BASKET-SAVAGE)

This study has been terminated.

Sponsor:
University Hospital, Basel, Switzerland

Collaborator:
University of Leipzig

Information provided by (Responsible Party):
Raban Jeger, University Hospital, Basel, Switzerland

ClinicalTrials.gov Identifier:
NCT00595647

First received: January 4, 2008
Last updated: June 18, 2013
Last verified: June 2013
History of Changes

Full Text View | Tabular View | No Study Results Posted | Disclaimer | How to Read a Study Record

ClinicalTrials.gov
A service of the U.S. National Institutes of Health

Example: "Heart attack" AND "Los Angeles"
Search for studies: Search
Advanced Search | Help | Studies by Topic | Glossary

Find Studies | About Clinical Studies | Submit Studies | Resources | About This Site

Home > Find Studies > Study Record Detail
Text Size

Drug-Eluting Stents vs. Bare Metal Stents In Saphenous Vein Graft Angioplasty (DIVA)

This study is currently recruiting participants. (see Contacts and Locations)
Verified June 2014 by Department of Veterans Affairs

Sponsor:
Department of Veterans Affairs

Information provided by (Responsible Party):
Department of Veterans Affairs

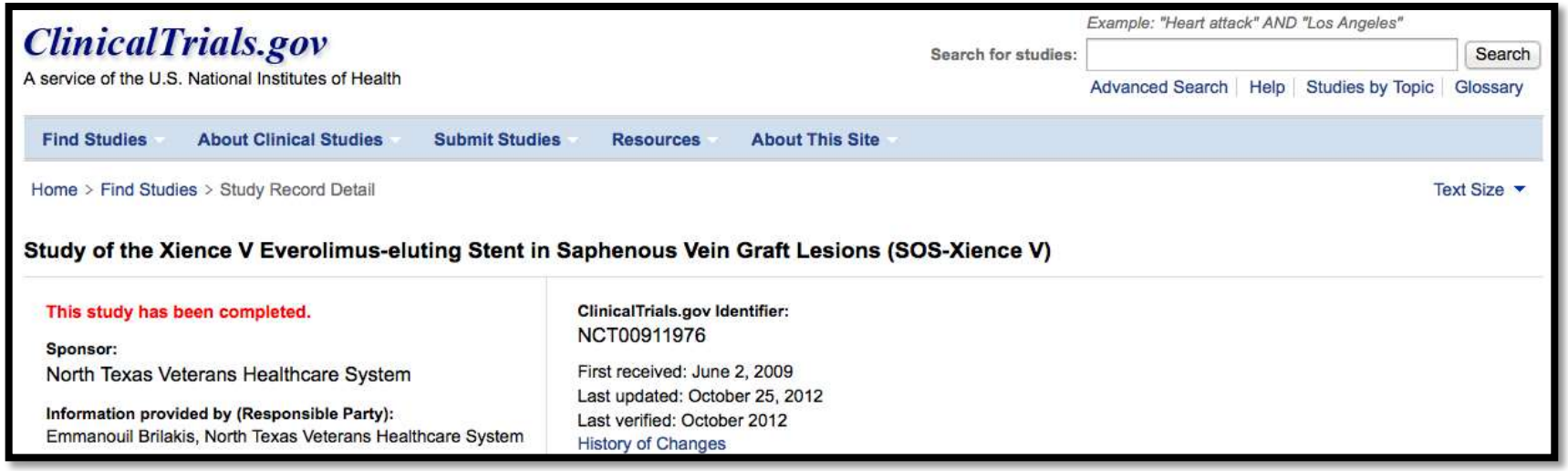
ClinicalTrials.gov Identifier:
NCT01121224

First received: May 7, 2010
Last updated: June 16, 2014
Last verified: June 2014
History of Changes

Full Text View | Tabular View | No Study Results Posted | Disclaimer | How to Read a Study Record

Cuál DES?

- No hay diferencia entre Paclitaxel y Sirolimus[1]
  - 172 pacientes del mundo real
  - Sobrevida a un año: HR: 1,28 p:0,69
  - TVR: HR: 2,54; p: 0,09



1. Lee MS, Hu PP, Aragon J, et al. Comparison of sirolimus-eluting stents with paclitaxel-eluting stents in saphenous vein graft intervention (from a multicenter Southern California Registry). Am J Cardiol 2010;106:337– 41.

Técnica de Intervención

- Predilatación vs Stent directo.
  - Beneficio potencial al atrapar trombo.
  - Reducción del 50% de la CPK-MB[1]
- Diámetro menor del stent.
  - Sub estimar el diámetro final del stent, podría reducir la embolización distal.[2]
  - Balancear con el riesgo de restenosis y trombosis.

1.Leborgne L, Cheneau E, Pichard A, et al. Effect of direct stenting on clinical outcome in patients treated with percutaneous coronary inter- vention on saphenous vein graft. Am Heart J 2003;146:501–6.

2.Hong YJ, Pichard AD, Mintz GS, et al. Outcome of undersized drug-eluting stents for percutaneous coronary intervention of saphe- nous vein graft lesions. Am J Cardiol 2010;105:179 – 85.

Dispositivos de protección embólica

- El 35% de las PCI en SVG aumentan la CPK-MB 4 veces más del rango normal.[1]
- Material aterosclerótico se extrae en el 95% de los casos que se usa algún dispositivo.[1]
- Recomendación clase I en las guías de PCI para SVG del ACC/AHA.[2]
- Sólo en el 23% de los pacientes.

1. Grube E, Schofer J, Webb J, et al., for SAFE Trial Study Group. Evaluation of a balloon occlusion and aspiration system for protection from distal embolization during stenting and saphenous vein grafts. Am J Cardiol 2002;89:941–5.

2. Smith SC Jr., Feldman TE., et al. ACC/AHA/SCAI 2005 guideline update for percutaneous coronary intervention (ACC/AHA/SCAI Writing Committee to Update the 2001 Guide- lines for Percutaneous Coronary Intervention). J Am Coll Cardiol 2006;47:216 –35.

Dispositivos de protección embólica

- Balón de oclusión distal.
  - PercuSurge GuardWire (Medtronic, Minneapolis, Minnesota)
  - TriActiv (Kensey Nash Corporation, Exton, Pennsylvania)
- Filtro embólico distal.
  - FilterWire EX (Boston Scientific).
  - SpideRx (ev3, Plymouth, Minnesota)
  - CardioShield (MedNova Ltd., Galway, Ireland)
- Balón de oclusión proximal.
  - Proxis (St. Jude Medical, Maple Groves, Minnesota)

Dispositivos de protección embólica
Ventajas y Desventajas

	Distal Filter	Distal Balloon Occlusion	Proximal Balloon Occlusion
Complete occlusion	No	Yes	Yes
Allows perfusion	Yes	No	No
Ischemia	No	Yes	Yes
Maintenance of antegrade blood flow during intervention	Yes	No	No
Protects before crossing lesion	No	No	Yes
Crossing profile	High (3.2-F)*	Low (2.7)†	NA
Maneuverability	Reduced	Good	Good
Ease of use	Simple	Complex	Complex
Capture of smaller particles	No	Yes	Yes
Capture of neurohormonal substances	No	Yes	Yes

Tratamiento farmacológico del No-Reflujo

- Predictores indepedientes:
  - Trombo probable
  - SCA
  - Puente degenerado
  - Lesión ulcerada.
- Los ensayos clínicos no son convincentes.
- Administrar por microcatéter.

Tratamiento farmacológico del No-Reflujo

- Adenosina
  - Vida media corta
  - Bradicardia extrema
  - Hasta 5 bolos de 24 mcgs.
- Nitroprusiato
  - 200-1000 mcgs
  - Hipotensión.
- Verapamilo
  - Antes de la PCI
  - 100-500 mcgs

Tratamiento farmacológico del No-Reflujo

- Nicardipna
  - Previo a la PCI
  - Disminuye la CPK-MB
- Adrenalina
  - 100-200 mcgs
  - Taquicardia sin arritmias.
- Nicorandil
  - STEMI
- Nitroglicerina
  - Sólo en vasoespasmo.

Conclusiones

- PCI en el vaso nativo siempre que sea posible.
- No abra SVG ocluidos crónicamente.
- Éxito de PCI en SVG es limitado.
- Inhibidores de GP IIB/IIIA no sirve.
- Intente stent directo.
- Stent cubierto sólo si rompe el puente.
- DES en la medida de lo posible.
- SIEMPRE use dispositivo de protección distal.
- No Reflujo? Todo sirve - Nada sirve