The A-Z of Achieving the Best Result in STEMI PCI

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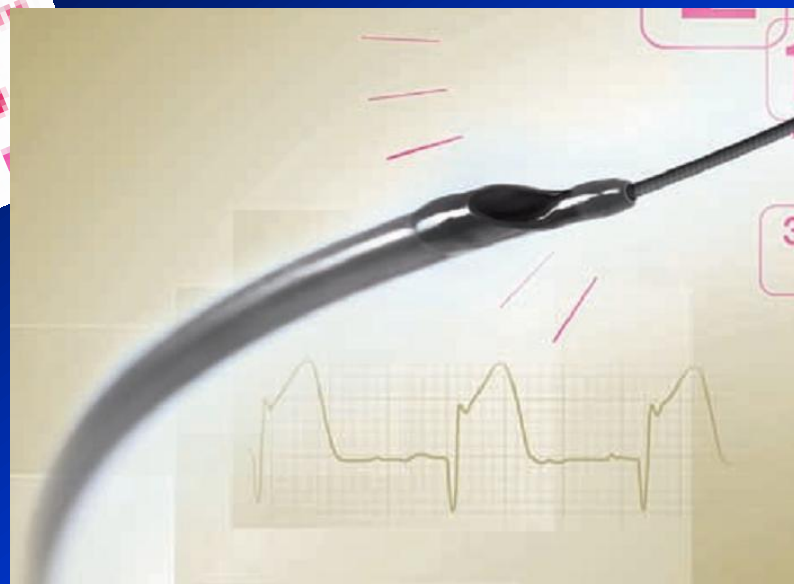
Announcement

- Hands-on practice on the Eliminate Aspiration Catheter
- ……at the Terumo Learning Centre: Booth AS019, Exhibition Hall, Level 3.



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First the "Big" Picture ……..

- Get patients into the lab FAST
- Focus on D2B time
  - EMS activation of cath lab
  - ED activation
    the
  - Tean within 20 minutes
    - ?
  - Streamlined approach
    - Verbal consent
    - Standardized equipment, prep, technique

……. In an analysis of STEMI patients arriving at the emergency department …… the door-to-activation time accounted for 93% of the variation in door-to-balloon times.

Circ Cardiovasc Qual Outcomes. 2012 Sep 1;5(5):672-9.

Standardization ……

- All get radial prep unless requested otherwise
- Standardized pharmacotherapy (for STEMI)
- Primary PCI “trolley” – has the most commonly used guides, wires, initial balloon (saves time)

Antiplatelet Therapy in ED

- Traditionally – aspirin and clopidogrel 600 mg

Prasugrel compared with clopidogrel in patients undergoing percutaneous coronary intervention for ST-elevation myocardial infarction (TRITON-TIMI 38): double-blind, randomised controlled trial

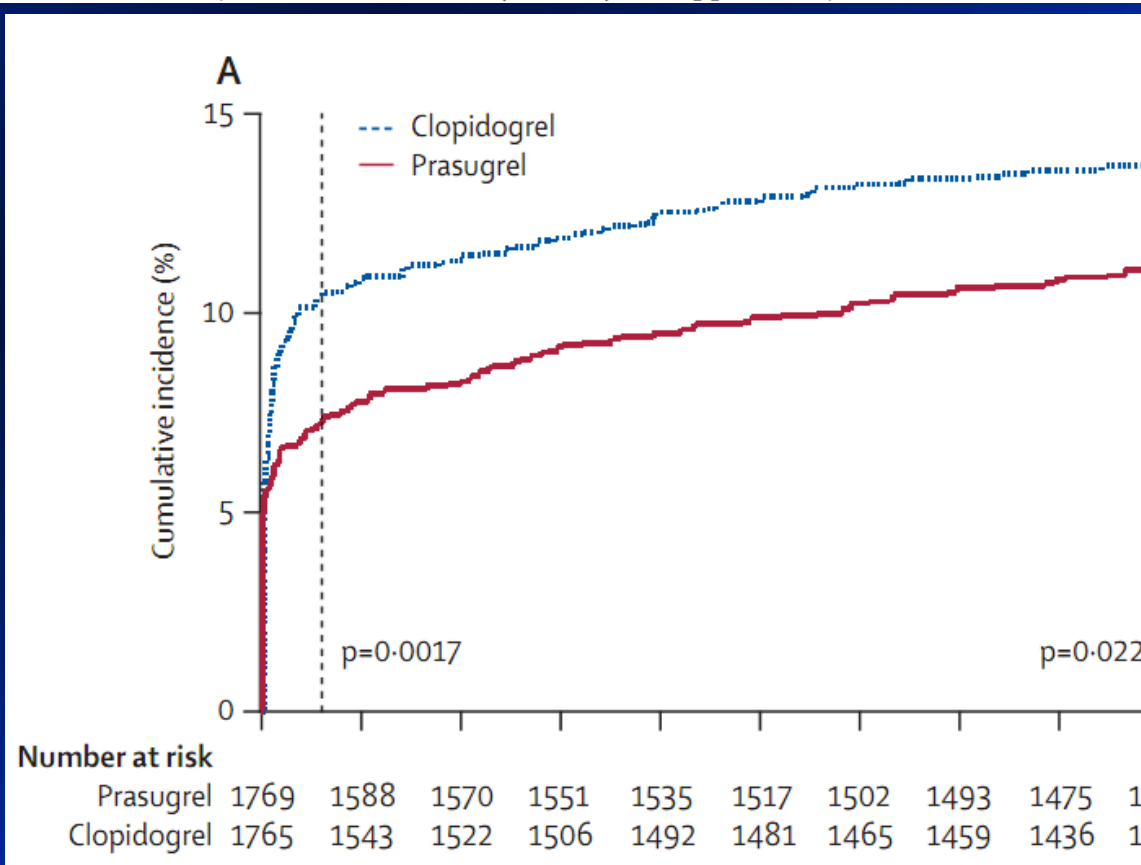
Gilles Montalescot, Stephen D Wiviott, Eugene Braunwald, Sabina A Murphy, C Michael Gibson, Carolyn H McCabe, Elliott M Antman, for the TRITON-TIMI 38 investigators

Summary

Background Mechanical reperfusion with stenting for ST-elevation myocardial infarction (STEMI) is supported by

Lancet 2009; 373: 723–31

Reduction in composite of death, MI, stroke (driven by reduced MI)

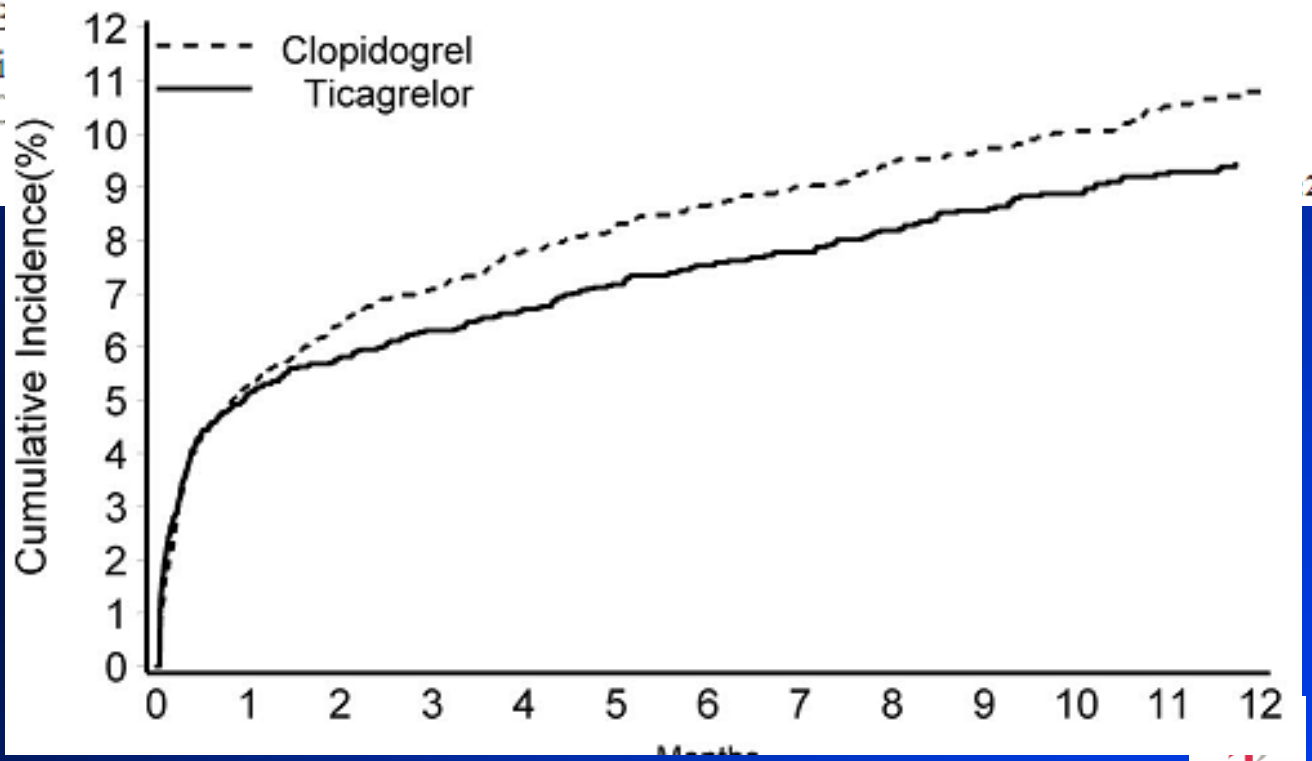


Ticagrelor Versus Clopidogrel in Patients With ST-Elevation Acute Coronary Syndromes Intended for Reperfusion With Primary Percutaneous Coronary Intervention

A Platelet Inhibition and Patient Outcomes (PLATO) Trial Subgroup Analysis

Philippe Gabriel Steg, MD; Stefan James, MD, PhD; Robert A. Harrington, MD; Diego Ardissino, MD;
Richard C. E
Ariel Finkelstei
Sylvia C

2131-2141.)



2013 American College of Cardiology (ACCF)/ American Heart Asssociation (AHA) Guidelines

A loading dose of a P2Y12 receptor inhibitor should be given as early as possible or at time of primary PCI to patients with STEMI. Options include:		
	Class*	**Level†**
Clopidogrel 600 mg	I	B
Prasugrel 60 mg	I	B
Ticagrelor 180 mg	I	B
$P2Y_{12}$ inhibitor therapy should be given for 1 year to patients with STEMI who receive a stent (bare-metal or drug-eluting) during primary PCI using the following maintenance doses:		
Clopidogrel 75 mg daily	I	B
Prasugrel 10 mg daily	I	B
Ticagrelor 90 mg twice a day	I	B

***Class I : Recommendation that procedure or treatment is useful/effective; evidence from single randomized trial or nonrandomized**
†Level B: Limited populations evaluated; data derived from a single randomized trial or nonrandomized studies.

[1] O'Gara, PT (2012). ACCF/AHA Guideline for the Management of ST-Elevation Myocardial Infarction. Available at http://content.onlinejacc.org/data/Journals/JACC/0/STEMI18.pdf

Our Hospital

- If < 75, weight > 60 kg, no prior TIA or stroke
  - Prasugrel 60 mg
- If any of the above
  - Clopidogrel 600 mg
- Perhaps ticagrelor 180 mg easier as only contraindication is prior intracranial bleed

Randomized Assessment of Ticagrelor vs. Prasugrel: Antiplatelet Effects in Patients with STEMI

Single-center study of 55 patients randomized to ticagrelor or prasugrel for 5 days and assessed for platelet reactivity.

P2Y12 Reaction Units	Ticagrelor	Prasugrel	*P* Value
1 Hour	257.3	231.3	0.2
2 Hours	196.1	153.6	0.2
5 Days	25.6	50.3	0.01

Conclusion: Both ticagrelor and prasugrel show evidence of delay in the onset of antiplatelet action in patients with STEMI.

Alexopoulos D, et al. *Circ Cardiovasc Interv*. 2012;Epub ahead of print.

Access

- Radial vs. femoral

Journal of the American College of Cardiology
© 2012 by the American College of Cardiology Foundation
Published by Elsevier Inc.

Vol. 60, No. 24, 2012
ISSN 0735-1097/$36.00
http://dx.doi.org/10.1016/j.jacc.2012.06.017

Radial Versus Femoral Randomized Investigation in ST-Segment Elevation Acute Coronary Syndrome

The RIFLE-STEACS (Radial Versus Femoral Randomized Investigation in ST-Elevation Acute Coronary Syndrome) Study

Enrico Romagnoli, MD, PHD,* Giuseppe Biondi-Zoccai, MD,† Alessandro Sciahbasi, MD,*
Luigi Politi, MD,‡ Stefano Rigattieri, MD,§ Gianluca Pendenza, MD,* Francesco Summaria, MD,*
Roberto Patrizi, MD,* Ambra Borghi, MD,‡ Cristian Di Russo, MD,§ Claudio Moretti, MD,‖
Pierfrancesco Agostoni, MD, PHD,¶ Paolo Loschiavo, MD,§ Ernesto Lioy, MD,* Imad Sheiban, MD,‖
Giuseppe Sangiorgi, MD#

Turin, Italy; and Utrecht, the Netherlands

JACC 2012; 60:2481-9

Results The primary endpoint of 30-day NACEs occurred in 68 patients (13.6%) in the radial arm and 105 patients (21.0%) in the femoral arm ($p = 0.003$). In particular, compared with femoral, radial access was associated with significantly lower rates of cardiac mortality (5.2% vs. 9.2%, $p = 0.020$), bleeding (7.8% vs. 12.2%, $p = 0.026$), and shorter hospital stay (5 days first to third quartile range, 4 to 7 days] vs. 6 [range, 5 to 8 days]; $p = 0.03$).

EuroIntervention 2013;8:1242-1251 published online ahead of print January 2013

CLINICAL RESEARCH

Consensus document on the radial approach in percutaneous cardiovascular interventions: position paper by the European Association of Percutaneous Cardiovascular Interventions and Working Groups on Acute Cardiac Care** and Thrombosis of the European Society of Cardiology

Martial Hamon[1*#], MD; Christian Pristipino[2#], MD; Carlo Di Mario[3], MD, PhD; James Nolan[4], MD; Josef Ludwig[5], MD, PhD; Marco Tubaro[6], MD; Manel Sabate[7], MD, PhD; Josepa Mauri-Ferré[8], MD; Kurt Huber[9], MD; Kari Niemelä[10], MD; Michael Haude[11], MD; William Wijns[12], MD, PhD; Dariusz Dudek[13], MD; Jean Fajadet[14], MD; Ferdinand Kiemeneij[15#], MD, PhD

International experts: Gerald Barbeau[16], MD; Shigeru Saïto[17], MD; Sanjit Jolly[18], MD; Yves Louvard[19], MD; Tejas Patel[20], MD; Sunil V Rao[21], MD; Nicolaus Reifart[22], MD; Philippe Gabriel Steg[23], MD; Orazio Valsecchi[24], MD; Yuenjin Yang[25], MD

A default radial approach is feasible in routine practice after appropriate training (both in stable and unstable patients including STEMI patients) but proficiency in the femoral approach is required because it may be needed as a bailout strategy or when large guiding catheters are required. Better results with radial access are expected with increasing procedural volume of operators.

Pharmacotherapy

- Anticoagulants
  - Unfractionated heparin
  - Low molecular weight heparin
  - Bivalirudin
- Ancillary therapy
  - IIbIIIa inhibitors

The NEW ENGLAND JOURNAL of MEDICINE

ORIGINAL ARTICLE

Bivalirudin during Primary PCI in Acute Myocardial Infarction

Gregg W. Stone, M.D., Bernhard Witzenbichler, M.D., Giulio Guagliumi, M.D., Jan Z. Peruga, M.D., Bruce R. Brodie, M.D., Dariusz Dudek, M.D., Ran Kornowski, M.D., Franz Hartmann, M.D., Bernard J. Gersh, M.B., Ch.B., D.Phil., Stuart J. Pocock, Ph.D., George Dangas, M.D., Ph.D., S. Chiu Wong, M.D., Ajay J. Kirtane, M.D., Helen Parise, Sc.D., and Roxana Mehran, M.D., for the HORIZONS-AMI Trial Investigators*

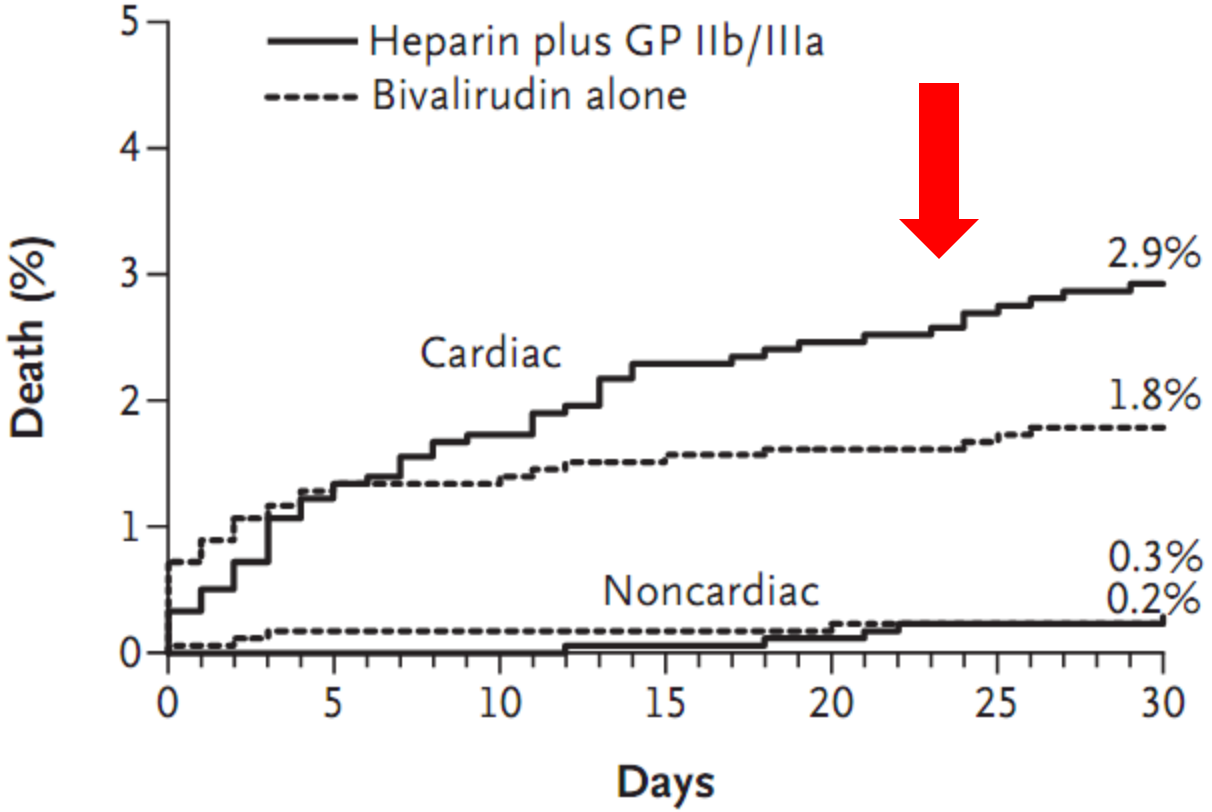
N ENGL J MED 358;21 WWW.NEJM.ORG MAY 22, 2008

A Net Adverse Clinical Events

B Major Bleeding

12
11

D Death from Cardiac and Noncardiac Causes

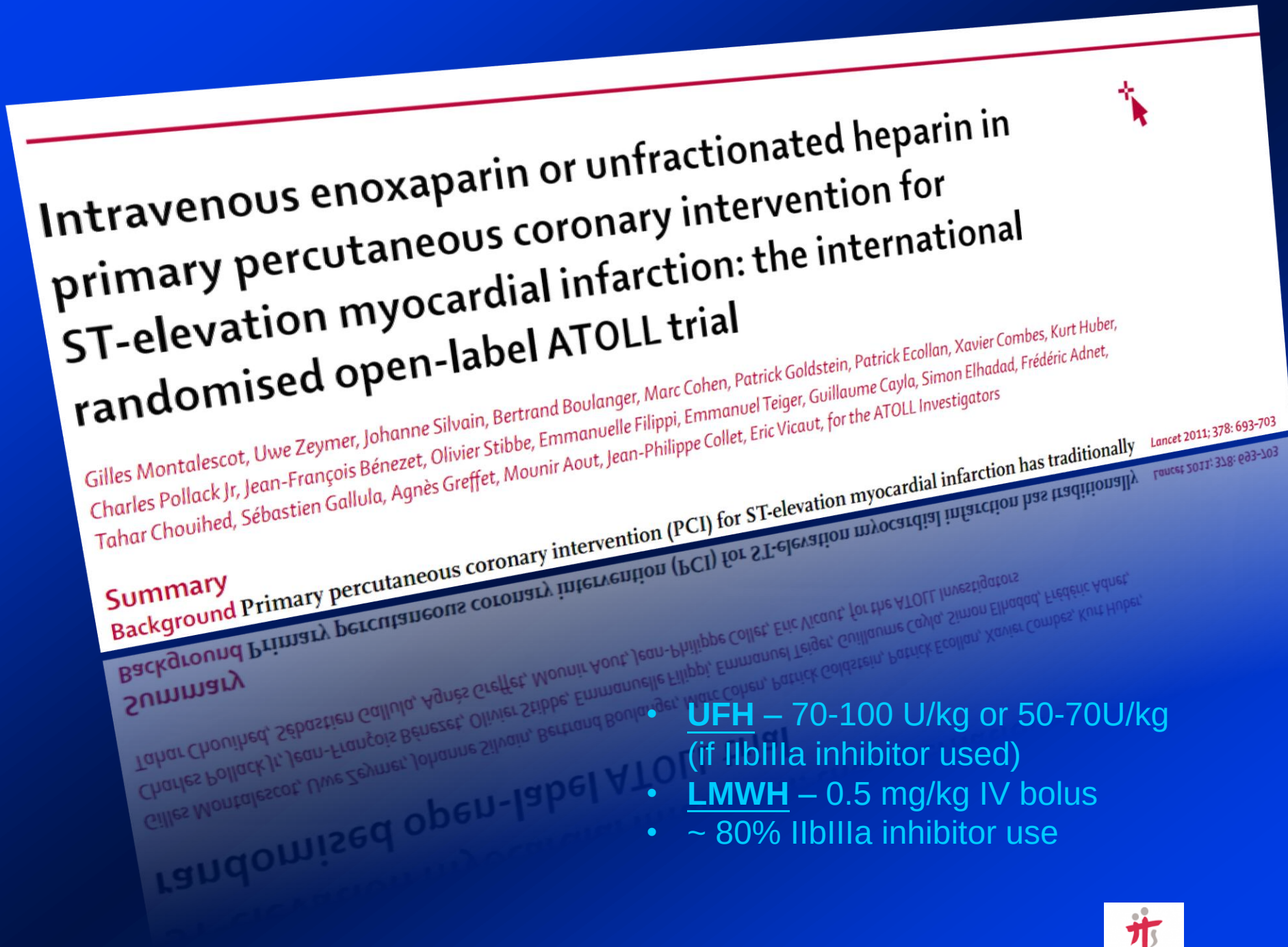


No. at R
Bivaliru
Heparin
GP IIb

No. at Ris
Bivalirudin
Heparin pl
GP IIb/I

No. at Risk

Bivalirudin alone	1800	1758	1751	1746	1742	1729	1666
Heparin plus	1802	1764	1748	1736	1728	1707	1630
GP IIb/IIIa							



- **UFH** – 70-100 U/kg or 50-70U/kg (if IIbIIIa inhibitor used)
- **LMWH** – 0.5 mg/kg IV bolus
- ~ 80% IIbIIIa inhibitor use

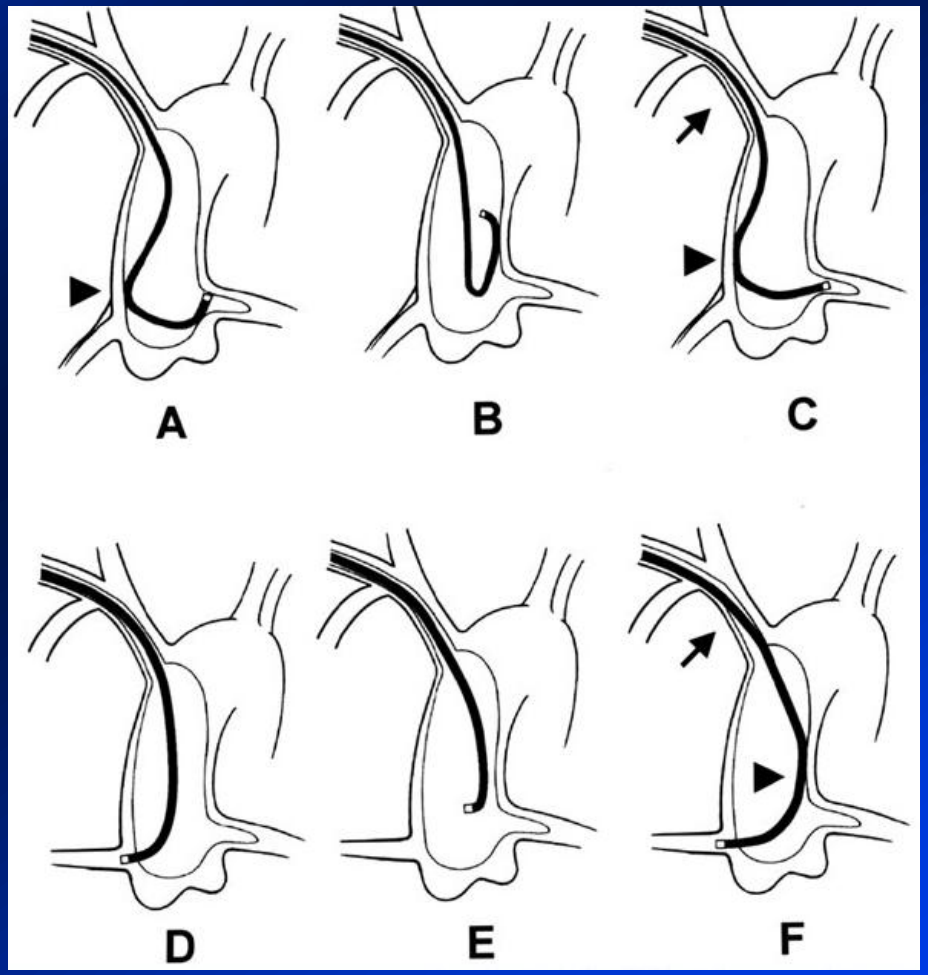
	Enoxaparin (n=450)	Unfractionated heparin (n=460)	Relative risk (95% CI)	p value
Death, complication of MI, procedure failure, or major bleeding (primary endpoint)	126 (28%)	155 (34%)	0·83 (0·68–1·01)	0·063
Death, recurrent MI or ACS, or urgent revascularisation (main secondary endpoint)	30 (7%)	52 (11%)	0·59 (0·38–0·91)	0·015
Death , complication of MI, or major bleeding (net clinical benefit)	46 (10%)	69 (15%)	0·68 (0·48–0·97)	0·030
Death or complication of MI	35 (8%)	57 (12%)	0·63 (0·42–0·94)	0·021
Death, recurrent MI, or urgent revascularisation	23 (5%)	39 (8%)	0·60 (0·37–0·99)	0·044
Death or recurrent MI	20 (4%)	32 (7%)	0·64 (0·37–1·10)	0·1026
Death, any cause	17 (4%)	29 (6%)	0·6 (0·33–1·07)	0·082

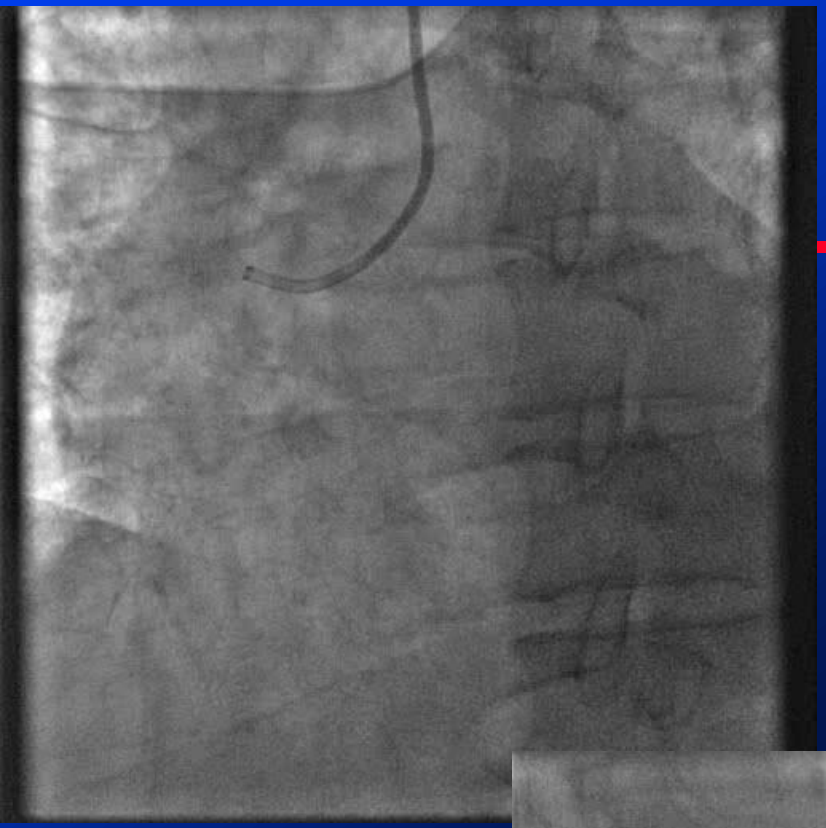
Criticism

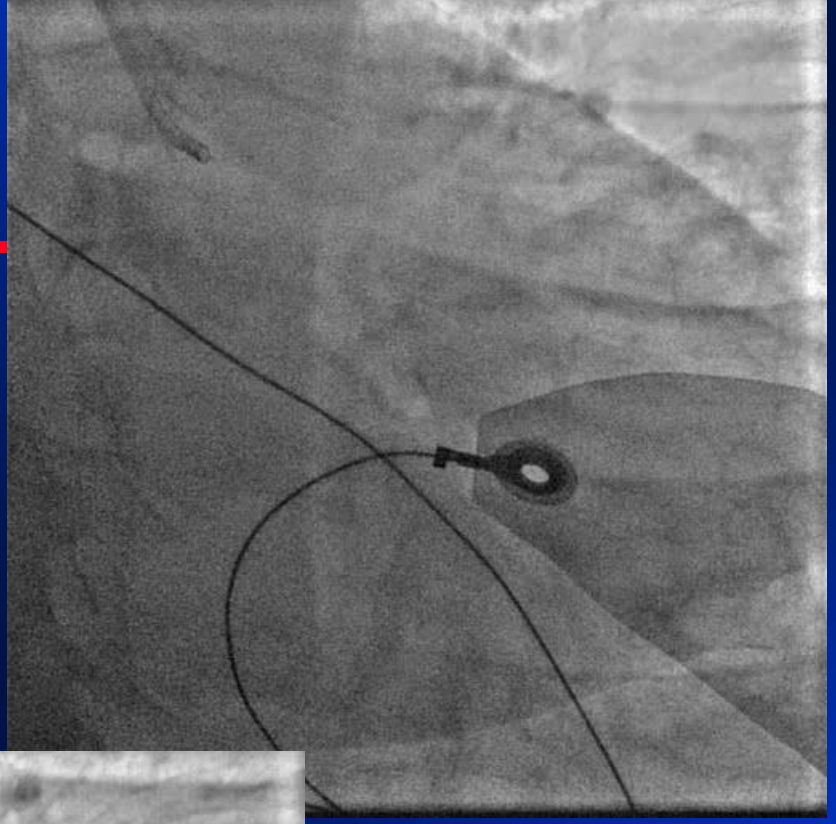
- Open label study
- Primary end point negative
- LMWH continued after procedure
- *Long procedure – no way to know where your anticoagulation is at after 1-2 hours (recommend "top up" 0.25 mg/kg IV)*

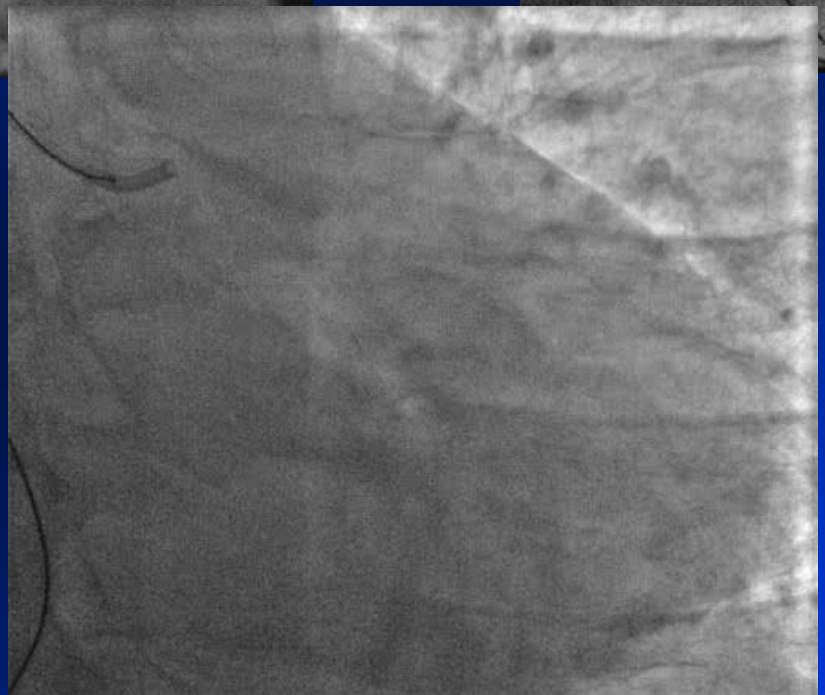
Guider

- Single guider – Ikari Left 3.5 (Terumo)
- Inferior MI
  - Quick look at LCA then do the RCA
- Anterior or Lateral MI
  - Go straight to the left coronary









Aspiration Thrombectomy

Aspiration Thrombectomy

Study	Study Acronym	Year	n =	Device	Primary Endpoint and Outcome	Clinical Endpoint and Outcome
Aspiration Thrombectomy						
Dudek et al[5]	–	2004	72	Rescue	(-) TIMI 3, cTFC, tMPG, (↑) STR	NA
Burzotta et al[6]	REMEDIA	2005	99	Diver C.E.	(↑) MBG ≥ 2, STR	(-) 30-day MACE
De Luca et al[7]	–	2006	76	Diver C.E.	(↑) MBG 3, STR	(-) 6-month MACE
Silva-Orrego et al[8]	DEAR-MI	2006	148	Pronto	(↑) MBG 3, STR	(-) in-hospital MACE
Kaltoft et al[9]	–	2006	215	Rescue	(-) Myocardial salvage	(-) 30-day MACE
Andersen et al[10]	–	2007	122	Rescue	(-) Left ventricular function	NA
Dudek et al[11]	PIHRATE	2007	196	Diver CE	(-) STR	(-) 6-month mortality
Chao et al[12]	–	2008	74	Export	(↑) Post-TIMI flow, MBG	NA
Ikari et al[13]	VAMPIRE	2008	355	TVAC	(↑, trend) SR/NR (TIMI<3)	(↑) 8-month MACE ($P < .05$)
Chevalier et al[14]	EXPORT	2008	249	Export	(↑) MBG 3, STR	(-) 30-day MACCE
Svilaas et al[15]	TAPAS	2008	1071	Export	(↑) MBG 0/1	(↑) 1-year mortality ($P = .04$), (↑) 1-year cardiac death ($P = .02$)
Lipiecki et al[16]	–	2009	44	Export	(-) IS	NA
Liistro et al[17]	–	2009	111	Export	(↑) STR	(-) 6-month MACE
Sardella et al[18]	EXPIRA	2009	175	Export	(↑) MBG ≥ 2, STR	(↑) 2-year cardiac death ($P = .0001$), (↑) 2-year MACE ($P = .04$)
Ciszewski et al[19]	–	2011	137	Rescue/ Diver C.E.	(↑) Myocardial salvage	(-) In-hospital mortality
Stone et al.	**Infuse AMI**	**2013**	**452**	**Export**	**(-) MRI Infarct size**	

Optimal Stenting .....

- Adequate distal flow
  - Intracoronary vasodilators – liberal use (adenosine, nitroprusside)
- Adequate sizing
  - Distal spasm common
  - Liberal use of intracoronary nitroglycerine
- Adequate stent
  - Which stent ?
  - Some suggestion – certain DES may be better
  - ? Mesh covered stent (M-Guard)

ORIGINAL CONTRIBUTION

Effect of Biolimus-Eluting Stents With Biodegradable Polymer vs Bare-Metal Stents on Cardiovascular Events Among Patients With Acute Myocardial Infarction

The COMFORTABLE AMI Randomized Trial

Scan for Author Video Interview

JAMA. 2012;308(8):777-787

Conclusion Compared with a bare-metal stent, the use of biolimus-eluting stents with a biodegradable polymer resulted in a lower rate of the composite of major adverse cardiac events at 1 year among patients with STEMI undergoing primary PCI.

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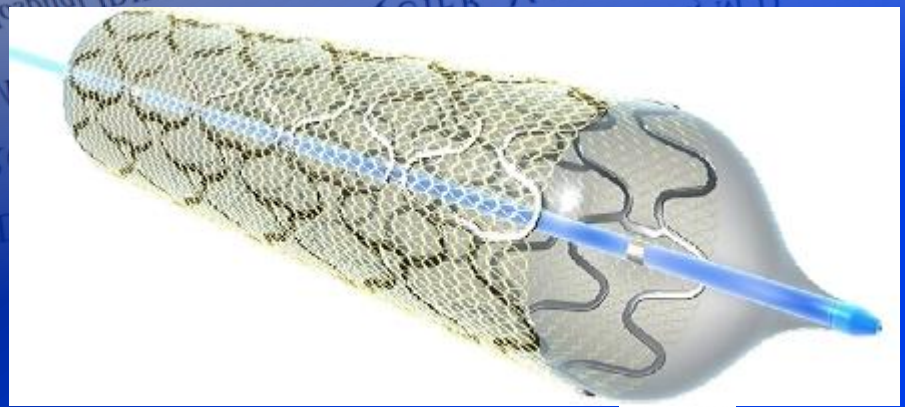
ACUTE CORONARY SYNDROME

MGuard Mesh-Covered Stent for Treatment of ST-Segment Elevation Myocardial Infarction with High Thrombus Burden Despite Manual Aspiration

RAFAEL ROMAGUERA, M.D., JOAN A. GÓMEZ-HOSPITAL, M.D., Ph.D., GUILLERMO SÁNCHEZ-ELVIRA, M.D., JOSEP GÓMEZ-LARA, M.D., Ph.D., JOSÉ L. FERREIRO, M.D., GERARD ROURA, M.D., MONTSERRAT GRACIDA, M.D., SILVIA HOMS, M.D., LUIS TERUEL, M.D., and ÁNGEL CEQUIER, M.D., Ph.D.

From the Heart Diseases Institute, Bellvitge University Hospital-IDIBELL, University of Barcelona, Barcelona, Spain

(J Interven Cardiol 2013;26:1–7)



Conclusion

- STEMI is a complex disease
- Optimization of results requires attention at multiple tiers
- Timing – D2B time is paramount
- Areas to target –
  - pre-procedural and intra-procedural pharmacology
  - Access site
  - Single guide
  - Prevention of distal embolization (?aspiration, vasodilators)
  - Stent choice