Post CABG MI

(Case Based)

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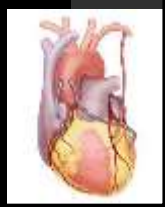
SBCC, KSA



Outlines

- **Case presentation**
- **Clinical outcome of STEMI in prior CABG pts**
- **Native coronary vs bypass graft PCI & DES vs BMS in SVG PCI**
- **Early Graft Failure**
- **Take Home Message**

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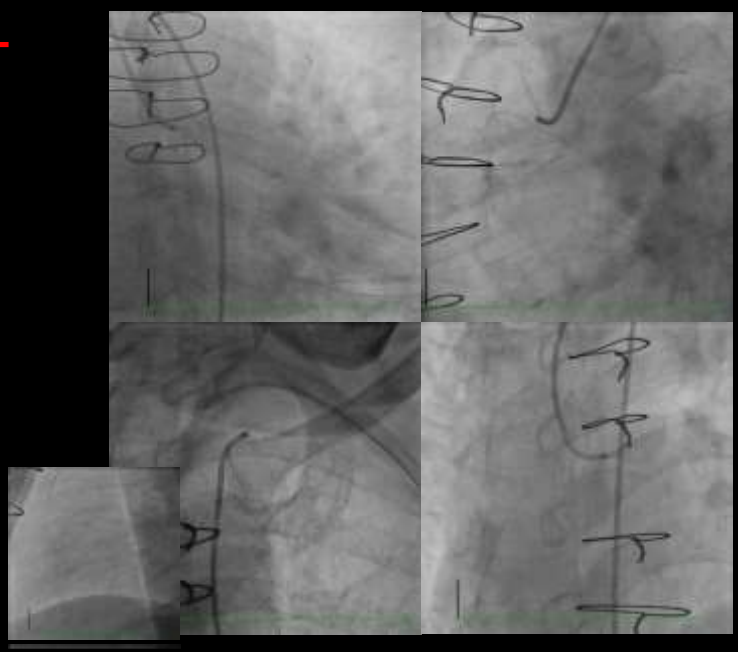
Case 1

Clinical Data

- 64 year–old male, HTN, chronic heavy smoker > 40 yrs
- CAD , prior CABG 7 years.
  - LIMA-LAD
  - SVG to diagonal & RCA
- Referred from peripheral hospital with ***inferior STEMI.***
- Typical chest pain of 5 hour duration

Case 1



Case 1

Infarct Related Vessel

Case 1

Native vs Bypass Graft Intervention

- ✓ Acute presentation of the case (inferior STEMI)
- ✓ The complexity of the native vessel lesion (long standing CTO)

Case 1

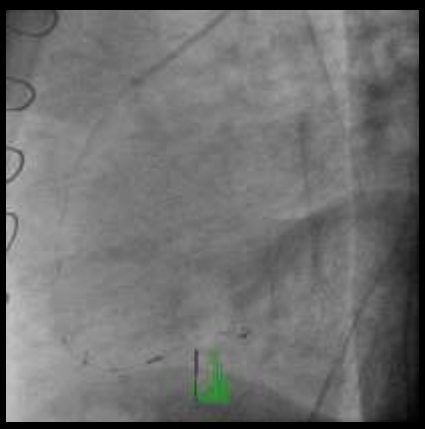
Bypass Graft Intervention

Aspiration Thrombectomy

Inability to Advance the Asp. Catheter across the Anastomotic site

Case 1

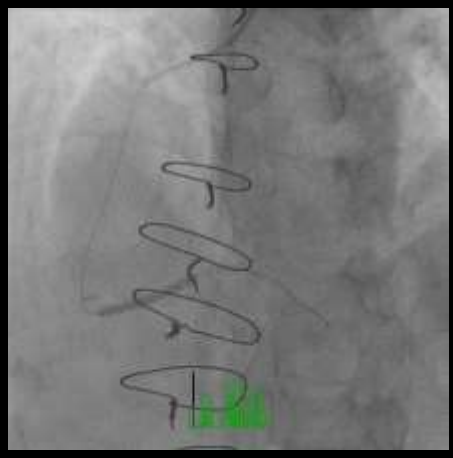
Bypass Graft Intervention



IVUS pullback from PLV to SVG across Anastomotic site

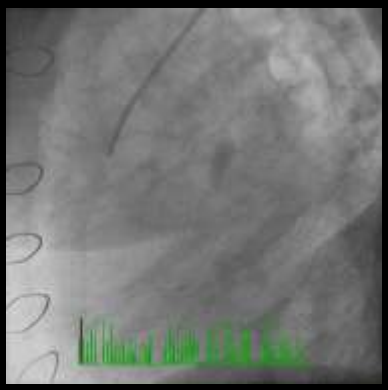
Case 1 Bypass Graft Intervention

- Direct Stenting
- IV & local GP IIb-IIIa inhibitors



Stenting Across the Anastomotic Site

Case 1 Bypass Graft Intervention



Final Angiogram

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Do patients with prior CABG behave differently when they develop ST- elevation MI ?

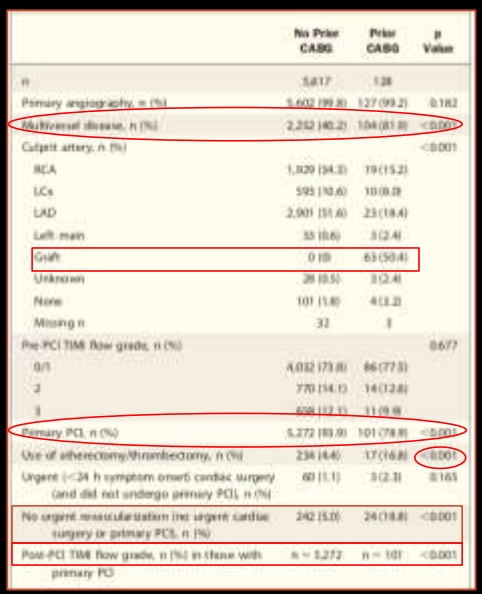
Prior Coronary Artery Bypass Graft Patients With ST-Segment Elevation Myocardial Infarction Treated With Primary Percutaneous Coronary Intervention

JACC INTERVENTIONS 2010

	No Prior CABG	Prior CABG	p Value
Baseline characteristics			
n	5,617	128	
Age, yrs, median (IQR)	61 (52.0–71.0)	69 (58.3–76.0)	<0.001
Women, n (%)	1,306 (23.3)	18 (14.1)	0.014
Hypertension, n (%)	2,749 (48.9)	90 (70.3)	<0.001
Prior myocardial infarction, n (%)	612 (10.9)	82 (64.1)	<0.001
Prior PCI, n (%)	881 (9.2)	52 (36.7)	<0.001
Prior CHF, n (%)	187 (3.3)	21 (16.4)	<0.001
Diabetes mellitus, n (%)	787 (13.7)	32 (25.0)	0.007
Heart rate, beats/min, median (IQR)	75 (65.0–86.0)	75 (65.0–85.0)	0.405
Systolic BP, mm Hg, median (IQR)	131 (117.0–150.0)	135 (115.0–154.0)	0.686
Killip class >I, n (%)	599 (10.6)	16 (12.5)	0.492
Nonreferral myocardial infarction, n (%)	1,287 (23.0)	66 (51.2)	0.139
Symptom onset to randomization (min), median (IQR)	166 (119.0–237.0)	167.3 (120.5–288.3)	0.439
Randomization to PCI (min), median (IQR)	30 (21.0–43.0)	37 (28.0–55.0)	<0.001

Welsh *et al., 2010*

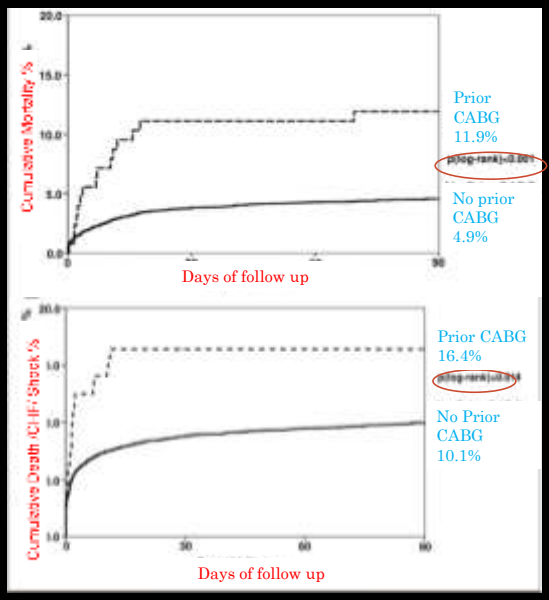
Angiographic & Revascularization Characteristics

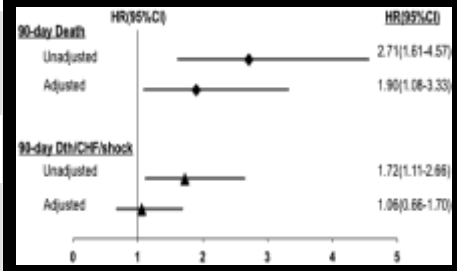


	No Prior CABG	Prior CABG	p Value
n	5,617	128	
Primary angiography, n (%)	5,602 (99.8)	127 (99.2)	0.182
Multivessel disease, n (%)	2,252 (40.2)	104 (81.9)	<0.001
Culprit artery, n (%)			<0.001
RCA	1,920 (34.3)	19 (15.2)	
LCx	595 (10.6)	10 (8.0)	
LAD	2,901 (51.6)	23 (18.4)	
Left main	55 (0.6)	3 (2.4)	
Graft	0 (0)	63 (50.4)	
Unknown	28 (0.5)	3 (2.4)	
None	101 (1.8)	4 (3.2)	
Missing n	32	1	
Pre-PCI TIMI flow grade, n (%)			0.677
0/1	4,032 (73.8)	86 (77.3)	
2	770 (14.1)	14 (12.6)	
3	658 (12.1)	11 (9.9)	
Primary PCI, n (%)	5,272 (93.9)	101 (78.9)	<0.001
Use of atherectomy/thrombectomy, n (%)	234 (4.4)	17 (16.8)	<0.001
Urgent (<24 h symptom onset) cardiac surgery (and did not undergo primary PCI), n (%)	60 (1.1)	3 (2.3)	0.165
No urgent revascularization (no urgent cardiac surgery or primary PCI), n (%)	242 (5.0)	24 (18.8)	<0.001
Post-PCI TIMI flow grade, n (%) in those with primary PCI	n = 5,272	n = 101	<0.001

Welsh et al., 2010

Clinical Outcomes & 90-Day Death





Welsh et al., 2010

Conclusion

- STEMI patients with prior CABG were older with an increased burden of comorbidities which is consistent with many other reports.
- Those patients were less likely to receive urgent mechanical reperfusion.
- Increased 90-day clinical events including mortality

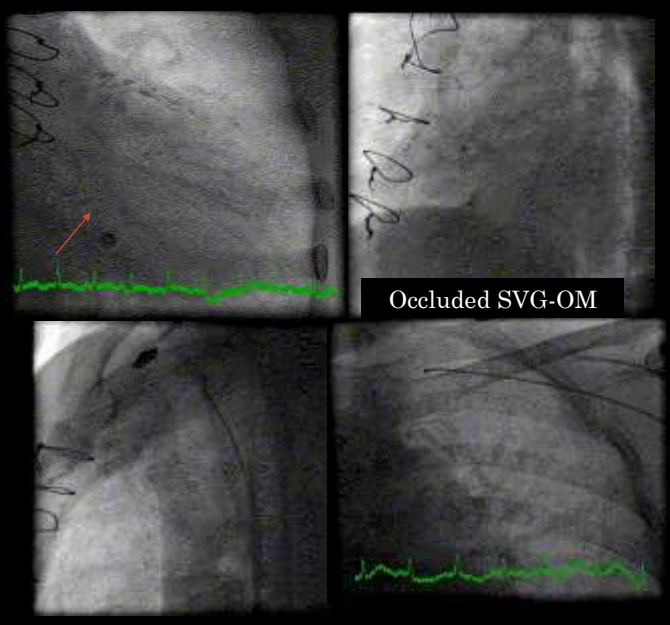
Am Heart J 2001;141:469–77.
Am J Cardiol 1990;65:1292–6.
8.J Am Coll Cardiol 2000;35:605–11.

Case 2

Clinical Data

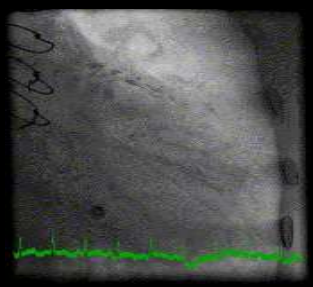
- 72 year–old lady, diabetic, HTN, hypothyroidism
- CAD, CABG one year ago, LIMA-LAD, SVG-OM.
- Presented with Non-STEMI
- ECG: ST-T changes in I, aVL, V4-6

Case 2



Case 2

Native vs Bypass Graft Intervention



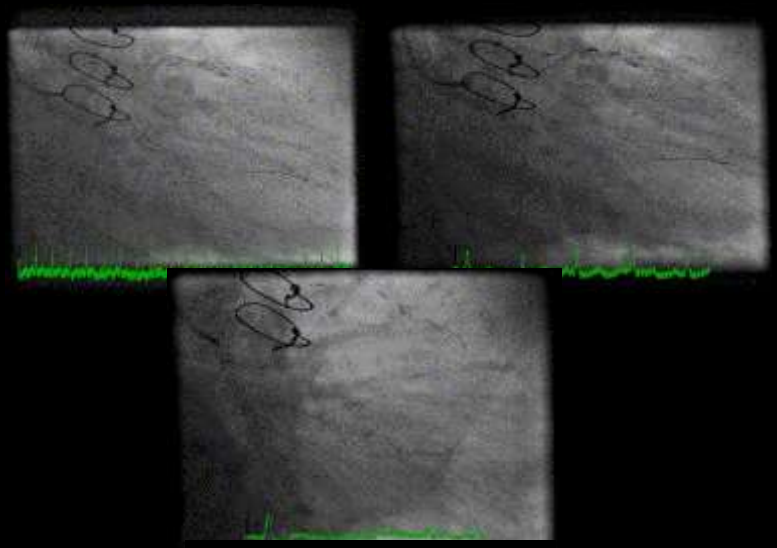
OM

Occluded SVG

- ✓ Clinical stability of the patient
- ✓ Feasibility of native coronary PCI

Case 2

Native Coronary Intervention



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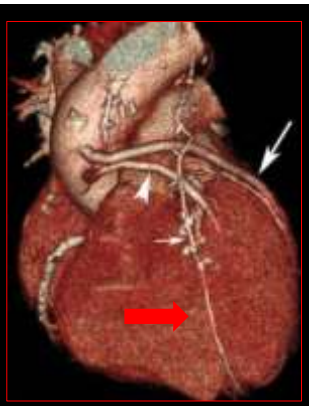
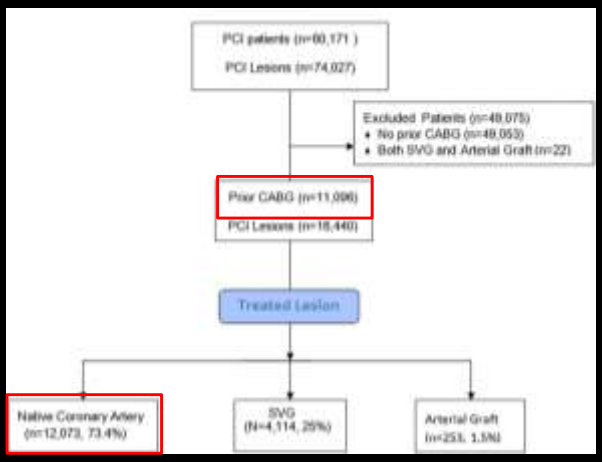
Appraising Native Coronary Artery Versus Bypass Graft PCI

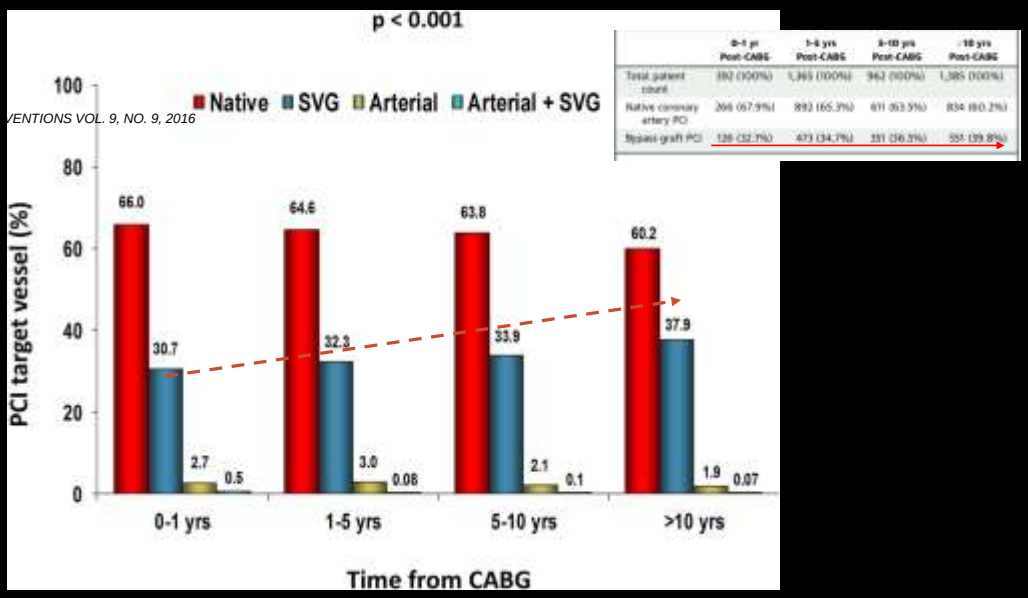


Percutaneous Coronary Intervention in Native Coronary Arteries Versus Bypass Grafts in Patients With Prior Coronary Artery Bypass Graft

J Am Coll Cardiol Intv 2016;9:884–93



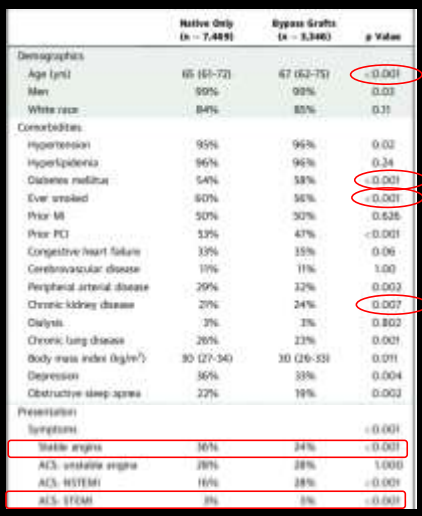
Brilakis et al., 2016



VENTIONS VOL. 9, NO. 9, 2016

Brilakis et al., 2016

Baseline Clinical & Lesion Characteristics



	Native Only (n = 7,469)	Bypass Grafts (n = 3,346)	p Value
Demographics			
Age (yrs)	65 (61-72)	67 (62-75)	<0.001
Men	69%	68%	0.03
White race	84%	85%	0.31
Comorbidities			
Hypertension	95%	96%	0.02
Hyperlipidemia	96%	96%	0.24
Diabetes mellitus	54%	58%	<0.001
Ever smoked	60%	56%	<0.001
Prior MI	50%	50%	0.626
Prior PCI	53%	47%	<0.001
Congestive heart failure	33%	35%	0.06
Cerebrovascular disease	11%	11%	1.00
Peripheral arterial disease	29%	32%	0.002
Chronic kidney disease	21%	24%	0.007
Dialysis	3%	3%	0.802
Chronic lung disease	26%	23%	0.001
Body mass index (kg/m²)	30 (27-34)	30 (26-33)	0.011
Depression	36%	33%	0.004
Obstructive sleep apnea	22%	19%	0.002
Presentation			
Symptoms			<0.001
Stable angina	36%	24%	<0.001
ACS: unstable angina	28%	28%	1.000
ACS: NSTEMI	16%	28%	<0.001
ACS: STEMI	3%	3%	<0.001

Embolic protection devices used in 26.3% of SVG PCIs

use of DES in only 65% of SVG

s

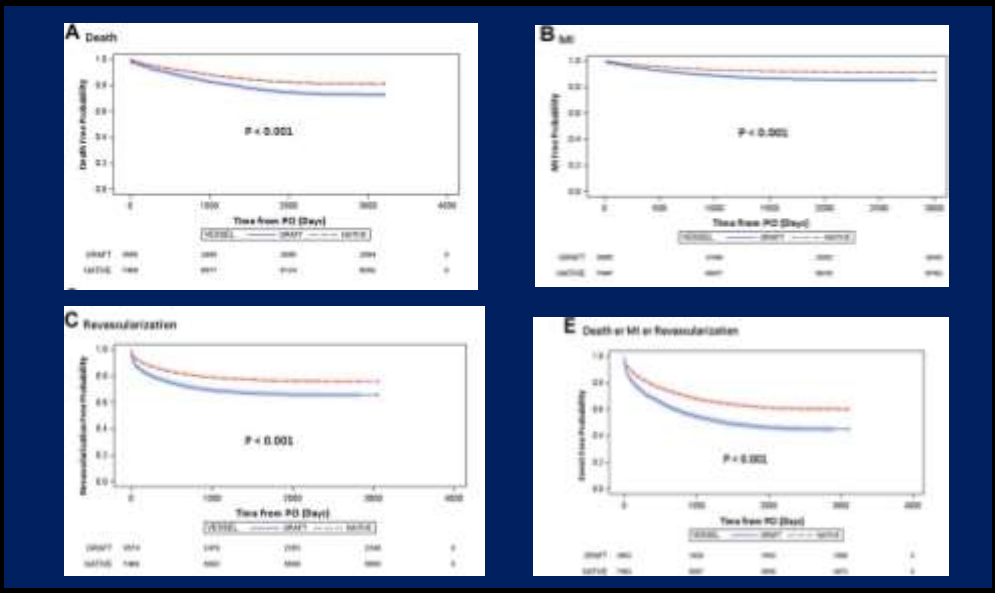
Brilakis et al., 2016

Procedure-Related Complications

Outcome	Native Only (n = 7,469)	SVGs (n = 3,346)	p Value
In-hospital mortality	0.83%	1.79%	<0.001
Procedural complications	5.80%	7.7%	<0.001
Dysrhythmia	0.68%	0.77%	0.633
Periprocedural MI	0.43%	1.00%	0.001
Cardiogenic shock	0.13%	0.36%	0.013
Stroke	0.00%	0.06%	0.098
No-reflow	0.40%	3.37%	<0.0001
Dissection	2.08%	0.94%	<0.0001
Perforation	0.20%	0.30%	0.302
Acute closure	0.44%	0.36%	0.640
Successful reopening	0.25%	0.25%	1.000
Bleeding	0.49%	0.44%	0.773
Other complications	4.11%	5.23%	0.009

Brilakis et al., 2016

Long-Term Clinical Outcomes (Native vs Bypass Graft)



Brilakis et al., 2016

Conclusion

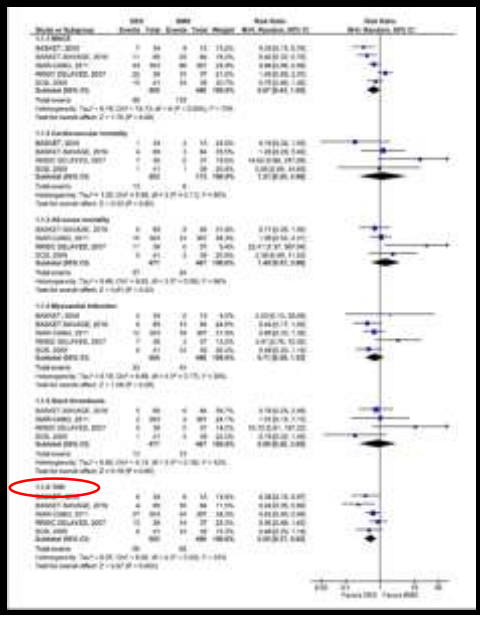
- Bypass graft PCI was associated with significantly higher mortality & higher risk for MI & repeat revascularization during long-term follow- up.
- Until RCTs are performed , native coronary arteries should be the preferred PCI target vessels, whenever possible.

Outlines

- Case presentation
- Clinical outcome of prior CABG pts when they develop STEMI
- Native coronary vs bypass graft PCI
- **Outcomes of DES vs BMS in saphenous venous Graft PCI**
- Early Graft Failure
- Take Home Message

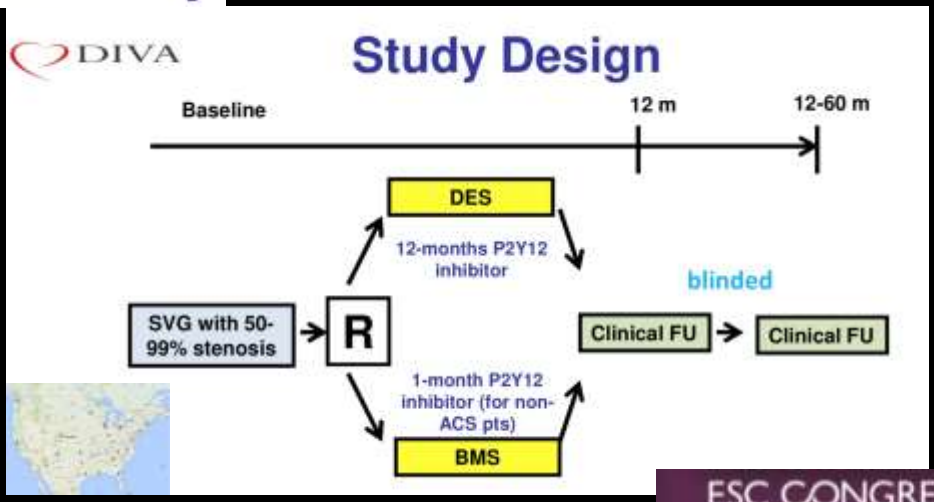
? Current Evidence Favor DES over BMS for SVG Interventions !!

- **Five RCTs**
  - 505 pts. DES
  - 480 pts. BMS
- **First generation DES**
- **Mean follow up :1.5 y**



JACC: VOL. 9, NO. 23, 2016

DIVA Study



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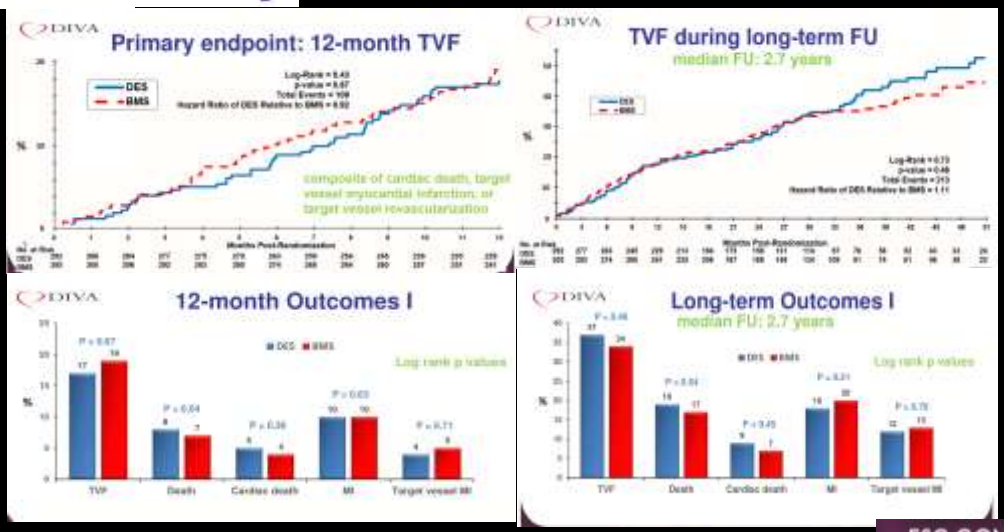
DIVA Study



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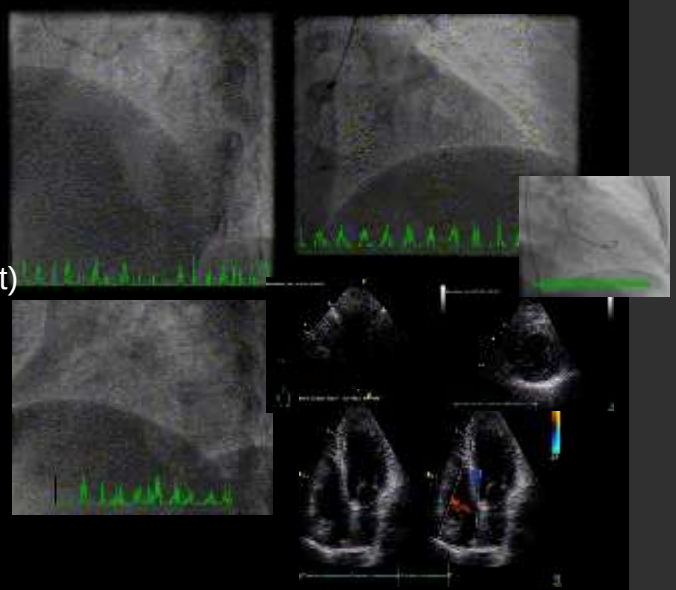
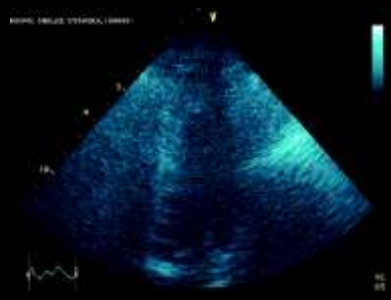
Case 3

- 66 year old lady.
- HTN, Dyslipidemic, PAD.
- Recurrent SOB (Angina Equivalent)
- Positive MPI (high risk)

Referred for Surgery



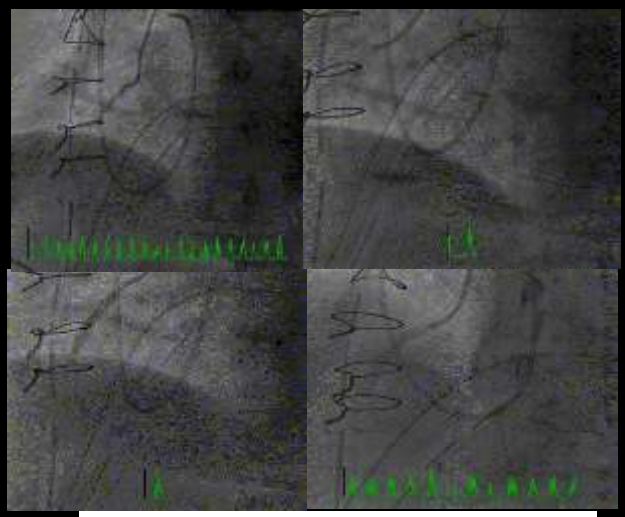
30 hours after Surgery



Postoperative Echo

- Significant ischemic ECG abnormalities
  ST elevation II-III-a VF
- Ventricular arrhythmias : NSVT
- Hemodynamic instability
  - despite high doses of vasoactive medications
- Marked elevation of troponin
  - > 5 times the upper references

Emergent Cardiac Catheterization



PCI of Native coronary Artery

Early SVG occlusion

- Within the 1st 30 days after surgery
- in approximately 5 to 10 % of SVGs.
- Early mortality in the range of 9–15%.
- Causes :
  - Generally related to technical problems at the anastomosis.
  - Conduit Injury due to manipulation during harvesting.
  - Poor target quality.

2014 ESC/EACTS Guidelines on myocardial revascularization

Recommendations	Class[a]	LoE[b]
Early post-operative ischaemia and graft failure		
Coronary angiography is recommended for patients with: • symptoms of ischaemia and/or abnormal biomarkers suggestive of perioperative myocardial infarction • ischaemic ECG changes indicating large area of risk • new significant wall motion abnormalities • haemodynamic instability.	I	C
It is recommended to make the decision on redo CABG or PCI by *ad hoc* consultation in the Heart Team and based on feasibility of revascularization, area at risk, comorbidities and clinical status.	I	C
PCI should be considered over re-operation in patients with early ischaemia after CABG if technically feasible.	IIa	C

Take Home Message

- **Pts with prior CABG represent a high risk group when they develop STEMI**
- **Compared with native coronary, bypass graft PCI is significantly associated with higher incidence of short & long-term MACE.**

- **Conflicting data regarding benefits of DES over BMS in SVG PCI**
- **Emergent cardiac catheterization is recommended for pts developing acute ischemia soon after CABG & PCI is a valuable option.**

Thanks