Primary Percutaneous Coronary Intervention and Large Thrombus Burden Lesions: A Questionable Impact of Mesh Covered Stent on the Frequency of No Reflow

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Background

- Multiple mechanical and pharmacological strategies have failed to prevent no reflow during primary PCI

- The mesh covered stent is a new technology proposed for the prevention of distal embolization during primary PCI

Background

- The size and morphology of coronary thrombus are important predictors of no reflow

- The impact of mechanical and pharmacological therapies on the prevention of no reflow in lesions containing a large thrombus burden is uncertain.

AIMS

To investigate the influence of the mesh covered stent on the frequency of angiographic no reflow in selective STEMI patients characterized by a large thrombus burden during primary PCI

Methods

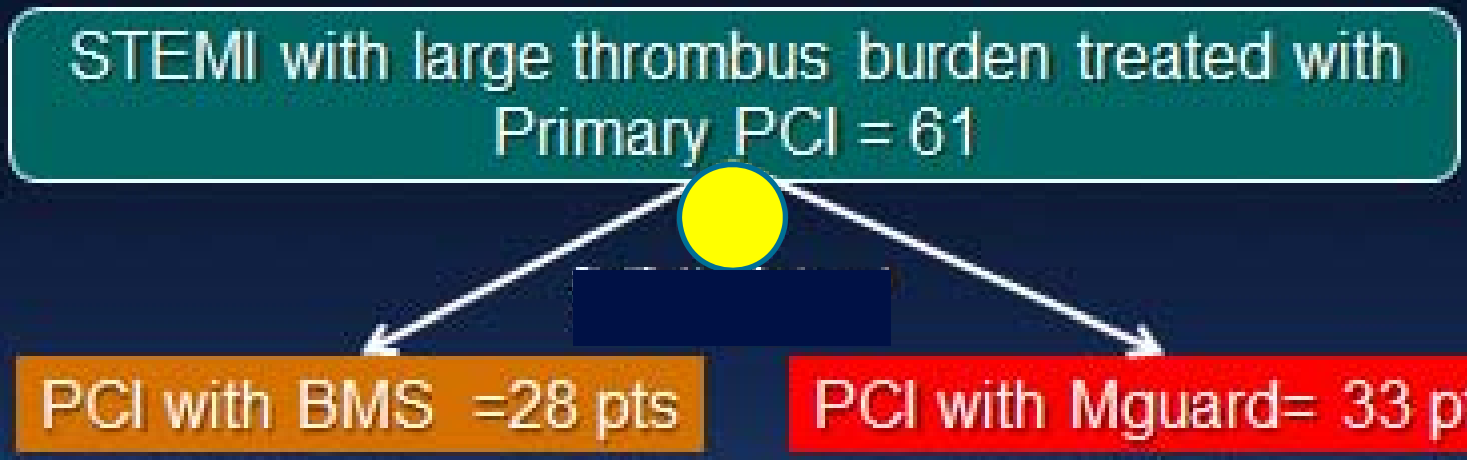
- Retrospective single center study
- Population: 61 pts with STEMI treated with primary PCI characterized by
  - TIMI Thrombus grade $\geq$ III
  - Use of the mesh covered stent (Mguard) or BMS
- Analyzed data: Demographic, clinical, angiographic and angioplasty variables

Methods

- Source of data: Electronic records and coronary angiography
- Patient selection
  - Mguard:
    - Identification of PPCI pts treated with Mguard
    - Angiography review
    - Selection of patients with TIMI thrombus $\geq$ III
  - BMS:
    - Randomized sample of 300 PPCI patiens
    - Angiography review
    - Selection of patients with TIMI thrombus $\geq$III

Methods

- Statistical Analysis
  - SPSS 18
  - Univariate analysis
    - Chi square for categorical variables
    - *t* test for continuous variables
  - Multivariate analysis
    - Logistic Regression Model



Endpoint: No Reflow, Coronary Emboli, Residual Thrombus, Corrected TIMI Frame Count, Final TIMI III, Final Blush III

Definitions

No reflow:

Transient or persistent reduction in TIMI flow grade after resolution of the flow limiting stenosis

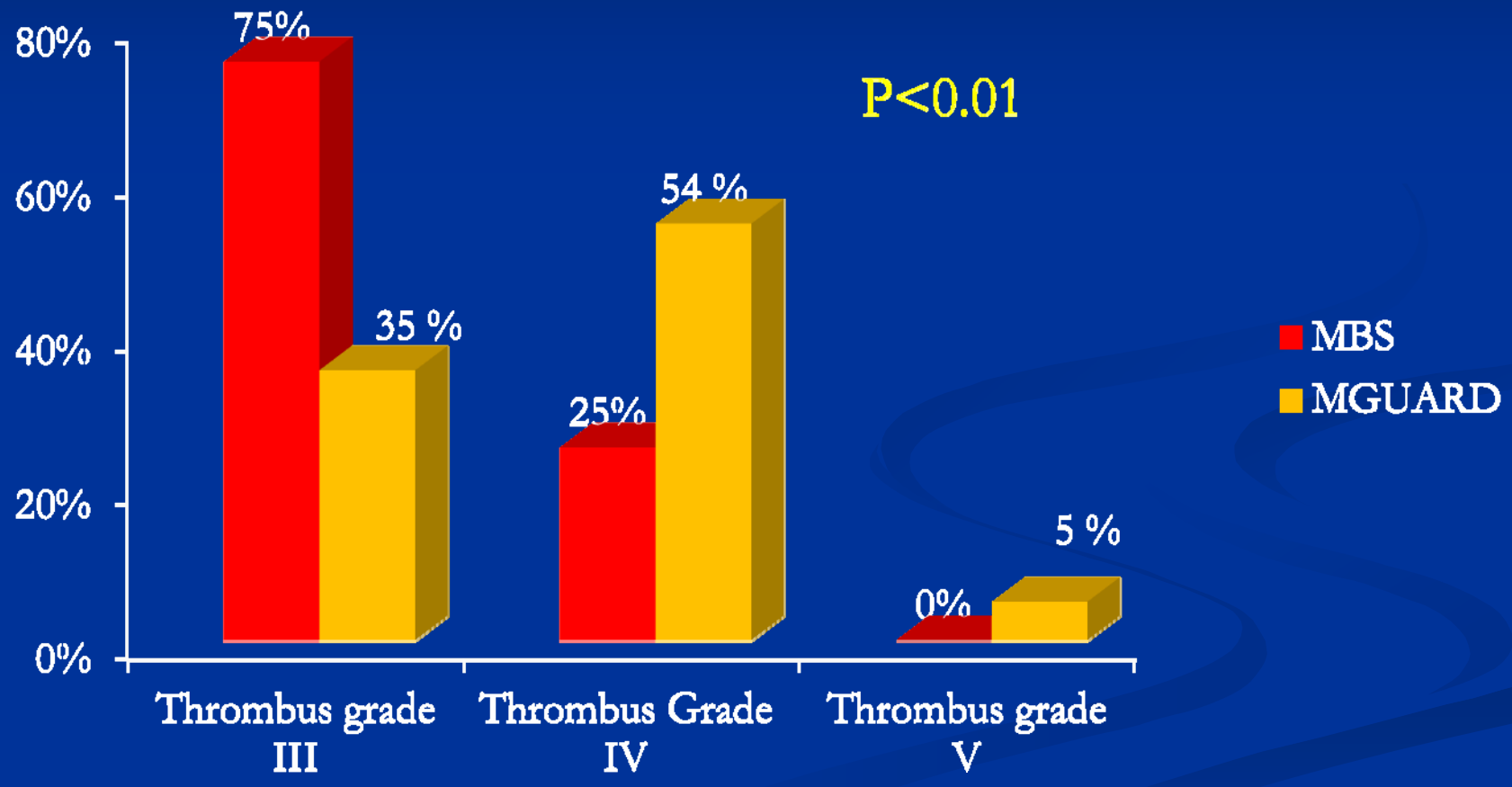
Definitions

- TIMI thrombus grade
  - TIMI 0: no angiographic evidence
  - TIMI 1: Possible thrombus (reduced contrast density, haziness, irregular contour
  - TIMI 2: (small): dimension < 1/2 vessel diameter
  - TIMI 3: dimension=1/2 to <2 vessel diameter
  - TIMI 4: > 2 vessel diameter
  - TIMI 5: total occlusion

Baseline Characteristics

	Mesh Covered Stent (33 p.)	BMS (28p.)	p value
Age (years)	54 ±11	59± 13	<0.05
Male (%)	88	89	ns
Hypertension (%)	71	75	ns
Dyslipidemia (%)	58	43	ns
Diabetes (%)	21	14	ns
Smoking (%)	76	71	ns
Symptoms-Device time (min.)	215 ±138	144 ±74	<0.05
Infarct artery=LAD(%)	56	36	ns
Baseline TIMI III (%)	12	25	ns
Baseline RVD (mm)	3.5 ± 0.6	3.1 ± 0.4	ns
Baseline DS (%)	98± 4	98 ±5	ns

TIMI Thrombus Grade



Procedures

	Mesh Covered Stent (33 p.)	BMS (28p.)	p value
Aspiration (%)	68	52	ns
Pre-dilatation (%)	16	35	ns
>1 stent implanted (%)	24	18	ns
Total stent length (mm)	18 ±6	18±5	ns
Maximal device size(mm)	3.3 ± 0.3	3.3± 0.4	ns
Maximal dilatation pressure (atm)	17 ±3	16± 2	ns

Procedural Results

	Mesh Covered Stent (33 p.)	BMS (28p.)	p value
Final TIMI III flow (%)	96	90	ns
Final TIMI flow	2.65 ± 0.5	2.64 ±0.6	ns
Corrected TIMI frame count	18 ± 10	23 ± 9	0.04
Myocardial blush=3	46	33	ns
Residual thrombus (%)	9	18	ns
Distal Emboli (%)	7	12	ns
Angiographic No Reflow (%)	0	14	0.02

Predictors of No Reflow: Multivariate Analysis

	p value	OR	95% CI
Mguard	0.9	1.1	0.98-1.02
Thrombus Score 4-5	0.8	1.3	0.07-25
Age (years)	0.09	1.08	0.98-1.22
Pain to Device Time (min)	0.6	0.99	0.98-1.02

Limitations

- Retrospective study
- Small number of patients
- Differences in the size of thrombus between BMS and covered stent groups
- Value of multivariate analysis limited by the small number of patients

Conclusions

- The mesh covered stent when implanted in lesions containing large thrombus burden in the setting of PPCI is associated with better angiographic result including cTFC and no reflow .
- This association did not persist after adjustment and larger studies are necessary

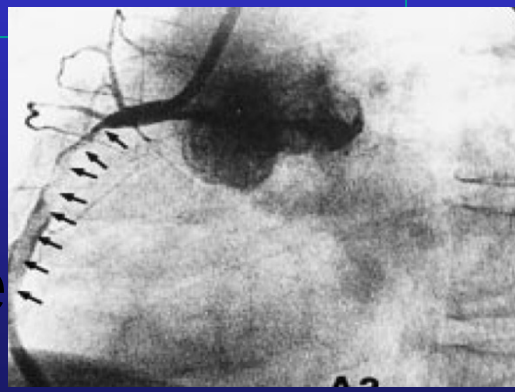
Professional and non scientific opinion

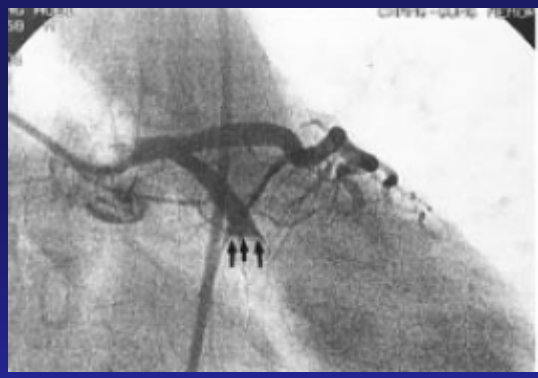
- In “imposible “ cases with large thrombus and high probability of no reflow the use of mesh covered stent alone or in combination with others techniques “ works” and allows to obtain a reasonable angiographic result and some degree of “satisfaction” at the end of the procedure.

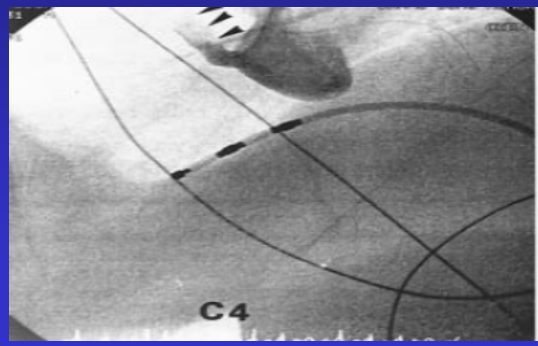
THANK YOU!!!

Angiographic predictors of no reflow

- Angiographic thrombus with:
  - Greatest linear dimension > 3 time the reference lumen diameter
  - Abrupt cutoff pattern
  - Accumulated thrombus proximal to the occlusion



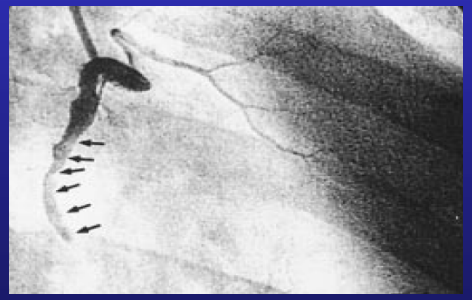




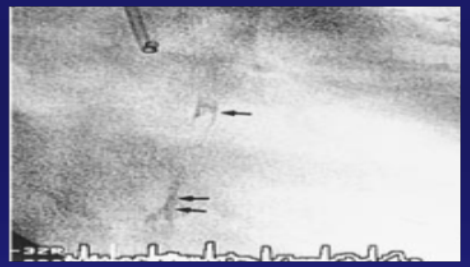
Yip HK, et al. Chest 2002;122:1322

High Thromboembolic Risk for No Reflow

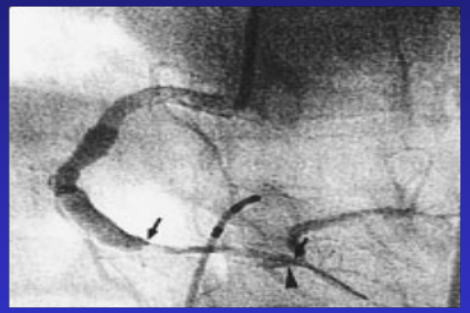
– Floating thrombus proximal to the occlusion



– Persistent contrast medium distal to the obstruction



– Lumen diameter > 4.0 mm



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