Excessive Thrombus Burden in Acute Myocardial Infarction: Novel Approaches

Dr. Niraj Gupta
MD, DNB (Cardiology), MNAMS, FSCAI, FAPSIC, FIMSA, FCCP, FSAMS
Consultant – Interventional Cardiology
Medanta – The Medicity
Delhi NCR, INDIA
History: 67 yrs male

- DM type 2 - 10 years
- HT – 10 yrs
- Smoker – 20 / day for 10 yrs
- No past h/o CAD
- Presented to triage at 9 pm
- Acute severe retro-sternal chest pain for last 4 hrs
- Hemodynamically stable

ECHO DONE AT TRIAGE

- Severely hypokinetic inferior wall and posterior wall, akinetic apex
- LVEF 35%
- Moderate MR
- Restrictive MIP
- Mild TR PASP = 60 mmHg
Coronary angiogram

- LAD – 80% proximal
- Lcx – Om 70%
- RCA – 70% mid – 100% distal with thrombus
- AOP– 100/70
- PAP – 56/20
The “Enemy” of primary PCI - Distal Embolisation
Epicardial flow is only the tip of the iceberg

In many occasions, during an attempt to optimize epicardial (TIMI) flow, myocardial perfusion is overlooked.
Large thrombus burden equals poor morbidity, high stent thrombosis

Use of drug eluting stents has become the state-of-the-art therapy for percutaneous treatment of obstructive coronary artery disease. However, concerns have been expressed on the delayed healing after implantation of a drug eluting stent. We present the first report of late thrombotic occlusion of a paclitaxel eluting stent (Taxus, Boston Scientific Corp) at just more than one year after implantation.

A 44 year old Indian man underwent implantation of a 3.0/24 mm paclitaxel eluting stent on 27 September 2002 for treatment of unstable angina caused by proximal left anterior descending (LAD) artery stenosis. Long term aspirin and six months of clopidogrel were prescribed, together with anti-lipid treatment. The patient was compliant but continued to smoke. He remained well until 8 October 2003 when he presented with chest pain for three hours, associated with diaphoresis. A 12 lead ECG showed ST segment elevation consistent with acute anterior myocardial infarction. Emergency coronary angiography confirmed a totally occluded proximal LAD artery, the site of the paclitaxel eluting stent (panel A). The occlusion was crossed using a 0.014 inch floppy guidewire, with immediate restoration of antegrade TIMI grade 2 flow. Heavy thrombus burden was noted in-stent. A PercuSurge Export aspiration catheter was used to aspirate the thrombus (lower left panel). Intravascular ultrasound (lower right panel) showed only mild in-stent neointimal hyperplasia, suggesting primarily a thrombotic event. The stent was well expanded except for a small segment at the proximal stent edge. No stent malapposition or edge stenosis was noted. A 1.0/10 mm cutting balloon, then a 3.2/15 mm NC monorail balloon was used to dilate the stent in sequence. The procedure was performed with the support of double bolus intracoronary doses of eptifibatide, given 10 minutes apart, followed by continuous intravenous infusion for 48 hours. Final angiography (panel B) showed no residual stenosis, TIMI 3 flow and myocardial blush grade 3.

Thrombus aspirated by the PercuSurge Export aspiration catheter.

Intravascular ultrasound image of the stent after thrombus aspiration. The stent was well expanded and apposed. No significant in-stent neointimal hyperplasia was detected.

2007 in the Journal of the American College of Cardiology
Reduce thrombus load

- I/V or I/C Gp IIbIIIa inhibitors
  - Abciximab
  - Eptifibatide
- Bivalirudin
- Aspiration catheters
- Distal & proximal protection devices

- **M Guard Stent**
What differentiates MGuard from other technologies?

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<th>MGuard</th>
<th>Manual Thrombus Aspiration</th>
<th>Mechanical Thrombectomy</th>
<th>Clearway</th>
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<tr>
<td>Fresh luminal thrombus</td>
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<td>Luminal organized thrombus</td>
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<td>Mural thrombus (fresh &amp; old)</td>
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<td>Mural plaque debris</td>
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<td>Present during stent deployment</td>
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<td>In total</td>
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2 in 1 Device:

- Micro-Mesh Technology for Embolic Protection
- Coronary Stent System
MGuard Micro-Mesh filter features:

- Poly-Ethylene-Terephthalate (PET) fiber
- 20µm thick
- Single Fiber
- Circular Knitting
- Pores size when deployed: 150µm - 180µm
- Attached & secured to the proximal and the distal crowns
Premedications

• Aspirin – 325 mg
• Prasugrel – 60 mg
• Atorvastatin -80mg
• Bivalirudin
Primary PCI to RCA

Pre – 100% with thrombus

Thrombosuction with Export Catheter
Thrombosuction done Thrice –
Large thrombus still persists
Protection Distal & Onsite

Spider distal protection 5f

M Gard – 3.5x39 @ 10 atm
Multiple ways of protecting distal embolisation

Balloon inflation starts at ends

Post stent distal thrombus still attached
Thrombus distal to stent and even distal to DPD: how to manage?

Export thrombosuction post balloon dilatation of stent, nothing extracted

Post Export in stent thrombus extending upto DPD
Onsite embolic protection with Dacron mesh covered stent

DPD removed - Large Thrombus distal to stent – leave it or stent it?

Another M guard 3.5 x 24 stent @ 10 atm.
Final result

Post M guard – TIMI III Flow

- Good alternative to other embolic protection devices
- Prevent embolisation
- Easy and fast to use where time is muscle

Dacron Mesh covered Stent
We divide our case approach according to thrombus burden

• **Large burden**
  - Heparin + Abciximab / Bivalirudin
  - Clopidogrel / Prasugrel / Ticagrelor
  - Aspiration
  - DPD
  - Mguard
    - Used in more than 100 cases
      - MI
      - Degenerated SVG’s
    - Don’t use protection device anymore
    - Excellent results match MASTER trial
Just Choose The Right Equipment To Go Further!