Effective Anti-thrombotic Therapy without Stenting: Intravascular OCT-based Management in Plaque Erosion (the EROSION study)

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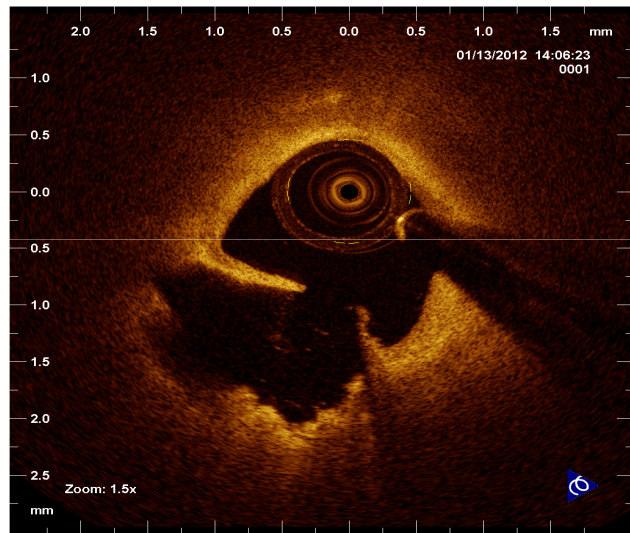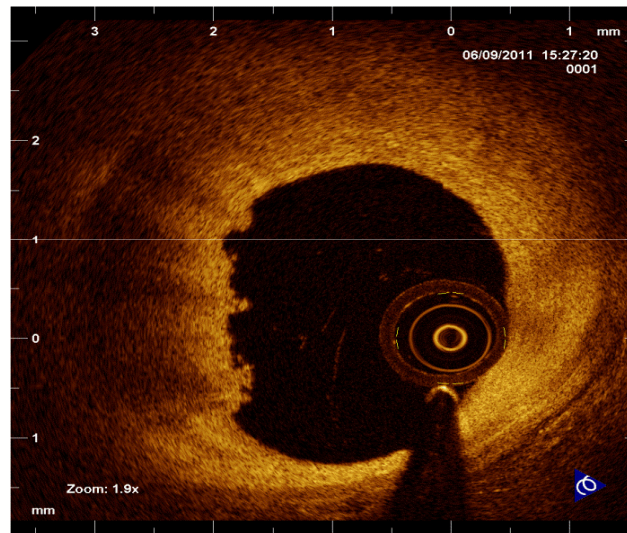# Declaration of Interest

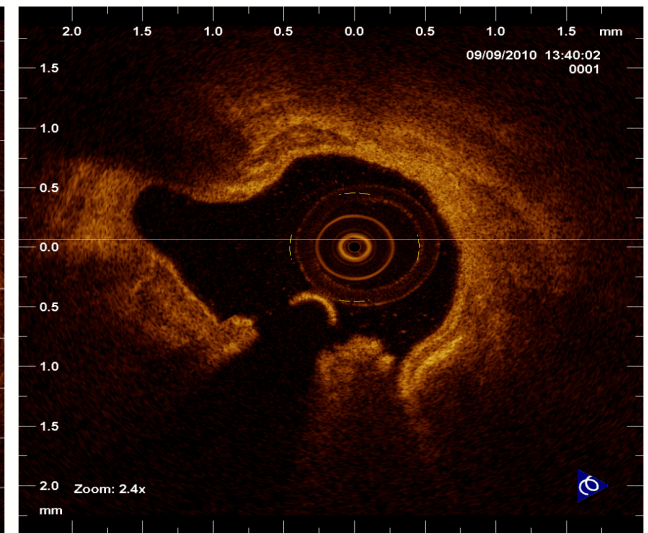- Others (Fellowship grant from St. Jude Medical)

Rupture

Erosion

Ca Nodule

Hypothesis

- Patients with plaque erosion may be stabilized by effective anti-thrombotic treatment without stent implantation, thereby abrogating both early and late complications related to the stent.
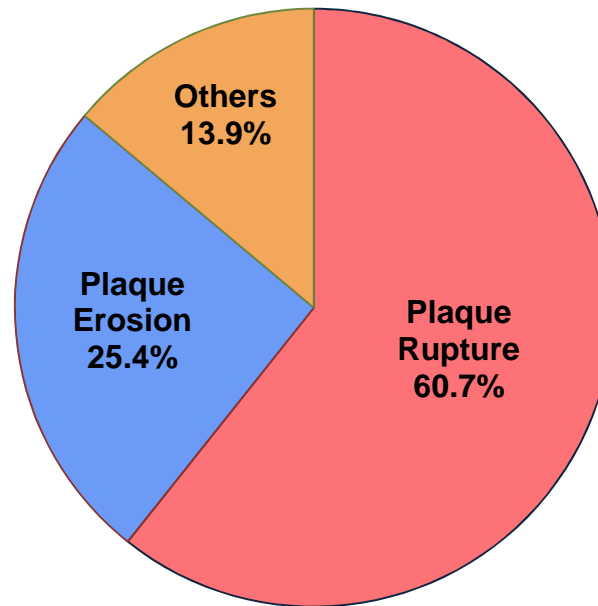
Treatment

- Aspirin, ticagrelor, and UFH <u>prior</u> to catheterization.
- GPI or aspiration thrombectomy at the discretion of the treating cardiologist.
- UFH or LMWH for 3 additional days.
- DAPT with aspirin and ticagrelor was continued.
- Follow-up OCT at 1 month.

Incidence of Plaque Erosion

Pie chart:
- Plaque Rupture 60.7%
- Plaque Erosion 25.4%
- Others 13.9%

OCT Analysis

| Variables	Baseline (n=60)	Follow-up (n=55)	Percent change (%)	*P*
Thrombus type				<0.001
White	44 (73.3)	29 (52.7)		
Red	16 (26.7)	4 (7.3)		
No thrombus	0 (0.0)	22 (40.0)		
Thrombus volume, mm^3				
Median (IQR)	**3.7 (1.3, 10.9)**	**0.2 (0.0, 2.0)**	**-94.2 (-100.0, -63.7)**	**<0.001**
Mean (SD)	**10.0 (17.4)**	**1.7 (2.8)**	**-79.2 (27.7)**	**<0.001**
Thrombus burden, %				
Median (IQR)	16.0 (8.9, 21.5)	2.9 (0.0, 9.2)	-85.4 (-100.0, -9.0)	<0.001
Mean (SD)	16.8 (11.4)	6.4 (9.0)	-58.2 (48.3)	<0.001
Mean thrombus area, mm^2				
Median (IQR)	0.5 (0.3, 1.0)	0.2 (0.0, 0.5)	-82.5 (-100.0, -14.2)	<0.001
Mean (SD)	0.8 (0.9)	0.3 (0.4)	-57.2 (48.5)	<0.001
Max thrombus area, mm^2				
Median (IQR)	1.0 (0.6, 2.2)	0.3 (0.0, 1.0)	-83.8 (-100.0, -25.0)	<0.001
Mean (SD)	1.7 (1.8)	0.6 (0.8)	-61.0 (44.9)	<0.001
Thrombus length, mm				
Median (IQR)	7.7 (5.4, 12.8)	1.5 (0.0, 4.9)	-79.7 (-100.0, -54.8)	<0.001
Mean (SD)	9.1 (5.4)	3.2 (4.5)	-70.8 (33.4)	<0.001
Thrombus score				
Median (IQR)	53 (37, 88)	7 (0, 27)	-87.5 (-100.0,-60.0)	<0.001
Mean (SD)	66 (49)	18 (24)	-75.8 (30.8)	<0.001
Minimal flow area, mm^2				
Median (IQR)	**1.7 (1.4, 2.4)**	**2.1 (1.5, 3.8)**	**15.0 (-8.6, 40.5)**	**0.002**
Mean (SD)	**2.3 (1.9)**	**2.9 (2.2)**	**27.4 (56.4)**	**0.001**

Change in Thrombus Volume
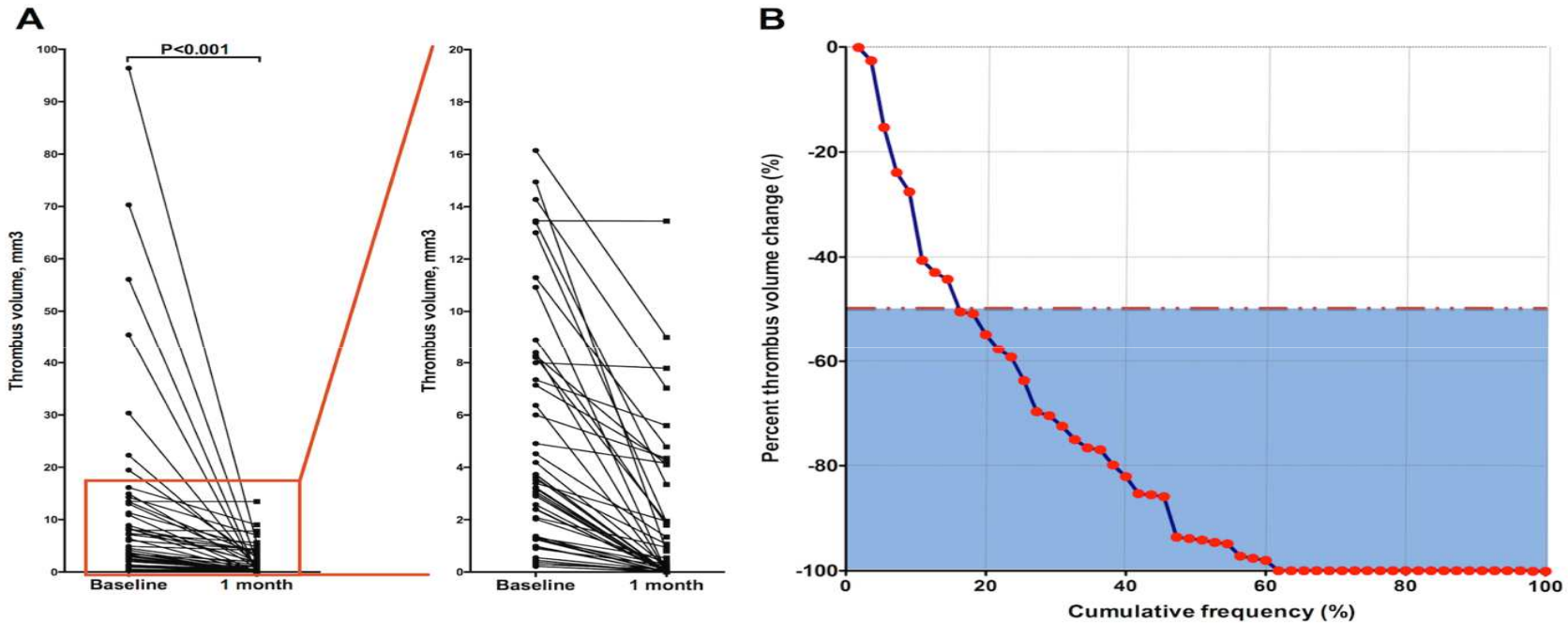
(A) Absolute change of thrombus volume from baseline to 1 month. (B) Cumulative distribution curves of percent thrombus volume reduction in all 55 patients. **Forty-seven (47/60, 78.3%; 95% CI: 65.8% - 87.9%)** patients met the primary endpoint (blue area) and twenty-two patients had no residual thrombus at 1 month (100.0% reduction).

Representative Case
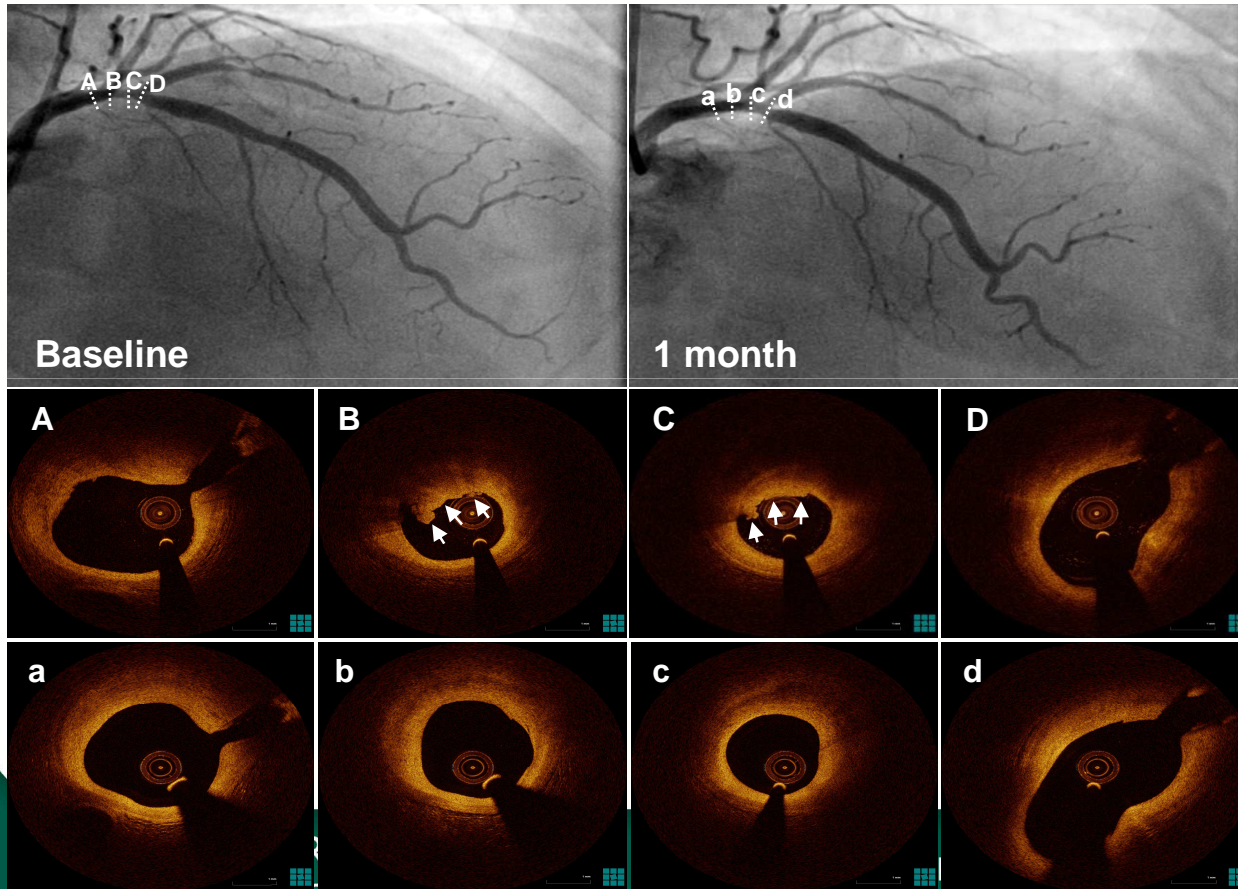
A 65-year-old man presented with STEMI. Baseline angiogram (upper left) shows a 55% stenosis in the proximal LAD. Serial OCT images of the culprit lesion demonstrate plaque erosion with white thrombus (arrows). One month F/U angiogram (upper right) shows a 45% stenosis, and serial OCT images (a-d) show no visible thrombus overlying a fibrous plaque. The minimal flow area increased from 2.4mm^2 to 4.0mm^2.

Conclusions

- Plaque erosion was the underlying pathology in ¼ of patients with ACS.

- Anti-thrombotic therapy without stent implantation effectively reduced thrombus volume and increased flow area without recurrent ischemic events at 1 month.

- Randomized trials will be needed to reproduce this pilot data and to further evaluate the long-term outcome of this new treatment strategy in patients with ACS caused by plaque erosion.