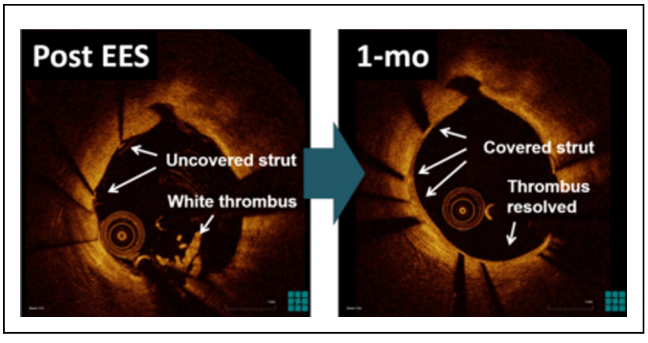
BACKGROUND Several clinical trials have indicated the advantage of everolimus-eluting cobalt chromium stents (EES) for the treatment of stable coronary artery disease (CAD), proposing its safety profile so as to shorten the duration of dual anti-platelet (DAPT) up to three months. However, the early vascular reactions during this period and underlying mechanisms remains unclear.

METHODS The MECHANISM Elective study is a multi-center registry designed to elucidate early vascular responses to EES for stable CAD patients using optical coherence tomography (OCT). Patients received OCT examination immediately after EES implantation (post EES) and were prospectively registered in either 1-month (1-mo) or 3-month scheduled OCT follow-up cohort. Among them, 1-mo cohort had been completed and images were independently analyzed. In addition to standard OCT parameters, incidence of intra-stent thrombus (IS-Th) and % length of IS-Th (the numbers of cross-section with IS-Th × 100 divided by total number of cross-sections within the stented segment) were assessed.

RESULTS Among a total of 51 patients (Age: 70±11 years, Male: 69%) enrolled in 1-mo cohort from 20 sites, 49 patients (52 EESs) were available for complete serial OCT analysis. Average stent length and area were 27.9±12.4 mm and 6.5±2.0 mm^2. Robust neointimal coverage was observed at 1-mo. Both % uncovered and % malapposed strut significantly decreased at 1-mo compared to post EES (Table, representative image in Figure). The incidence and the length of IS-Th significantly decreased at 1-mo. Most of intra-stent and edge dissections was resolved (Table).

49 case (52 stents)	Post EES	1-mo	P value
Lumen area (mm^2)	6.7±2.1	6.6±2.1	0.09
Thickness of neointima (μm)		28±13	
Area of neointima (mm^2)		0.056±0.31	
% Uncovered strut (%)	86.3±9.9	6.4±10.2	<0.001
% Mal apposed strut (%)	7.5±6.0	2.9±3.6	<0.001
Intra-stent dissection (n (%))	40 (76.89%)	9 (17.3 %)	<0.001
Proximal edge dissection (n (%))	10 (19.2%)	4 (7.7%)	0.0017
Distal edge dissection (n (%))	7 (13.4%)	3 (5.8%)	0.017
Incidence of IS-Th (n (%))	33 (63.5%)	17 (32.7 %)	<0.001
% Length of IS-Th (%)	7.4±10.9	2.5±4.9	0.001
(IS-Th; Intra-stent thrombus)			



CONCLUSIONS MECHANISM Elective study 1-mo cohort firstly revealed the early vascular reactions following EES implantation in Stable CAD patients. Considering dynamic resolution of IS-Th and dissections with the rapid decrease in uncovered and malapposed strut at this early phase, EES may have a potential to shorten the DAPT duration up to 1 month in this patient subset.

CATEGORIES **IMAGING:** Intravascular

KEYWORDS Drug-eluting stent, everolimus, Drug-eluting stent, second generation, Imaging

TCT-49

Underlying stenosis severity is independent of culprit plaque morphology in STEMI – an optical coherence tomography study

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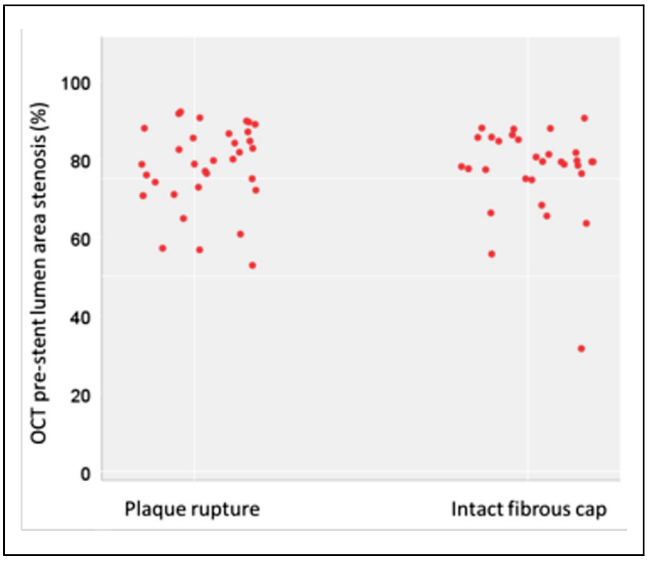
BACKGROUND Prior data has suggested that patients with STEMI without a ruptured plaque (intact fibrous cap, IFC) have mild stenoses after thrombectomy and therefore may be managed without stenting. This finding needs to be validated in a larger prospective study. In the present study, we compared angiographic and imaging findings between IFC and plaque rupture (PR) culprit lesions in patients with STEMI undergoing primary PCI.

METHODS We studied patients in an OCT substudy of the TOTAL (ThrOmbecTomy versus PCI ALone) trial who were randomly assigned to aspiration thrombectomy (n=93). Culprit plaque morphology, quantitative lesion parameters, plaque composition (at 1mm intervals), and fibrous cap thickness were measured by an independent OCT core laboratory.

RESULTS Of the 93 patients with OCT imaging following thrombectomy, culprit lesion morphology was assessable in 70 (75.3%) patients. The culprit lesion morphology was IFC in 31 (44.3%) patients, PR in 34 (48.6%) patients, and calcified nodule in 5 (7.1%) patients. By quantitative coronary angiography, pre-procedure reference vessel diameter was smaller in IFC (2.7 ± 0.6 mm) vs. PR (3.1 ± 0.8 mm) (p = 0.042), while diameter stenosis was not different (92.5 ± 11.2 vs 90.9 ± 11.1 in IFC vs PR) (p = 0.61). Following thrombectomy, OCT demonstrated that IFC had smaller reference vessel area, but similar lumen area stenosis (75.9% vs 77.4%, IFC vs PR) (p=0.64) (Figure) and lumen diameter stenosis (51.8% vs 53.5%, IFC vs PR) (p=0.59). Lumen area stenosis <50% was observed in none of the patients with PR and in 1 patient with IFC. IFC had fewer quadrants with lipid plaque (28.16 ± 15.02 vs 39.12 ± 14.23, IFC vs PR), (p = 0.004) and thicker fibrous cap (91.03 ± 16.97 vs. 62.05 ± 9.13, IFC vs PR) (p<0.001) as compared to PR.



CONCLUSIONS IFC lesions had smaller reference vessel dimensions, however, pre-procedure and post-thrombectomy stenosis severity was similar. Mild stenoses were uncommon suggesting that the in vivo diagnosis of IFC may not alter management in most patients with STEMI.

CATEGORIES **IMAGING:** Intravascular

KEYWORDS OCT, Plaque erosion, ST elevation myocardial infarction