

Detection of morphology of vulnerable Plaque by OCT

Key Points:

- New OCT technique can identify vulnerable lesion morphology and ruptured plaques
 - Thin-capped fibroatheromas associated with increased levels of high-sensitive CRP
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By Kiersten Feil

New findings show that using non-occlusive optical coherence tomography (OCT) in patients with acute coronary syndromes can help identify vulnerable thin-capped fibroatheromas (TCFAs) and ruptured plaques in culprit coronary arteries. The study, published online ahead of print in the August 4, 2008, issue of *American Journal of Cardiology*, also found TCFAs to significantly correlate with high plasma levels of C-reactive protein (CRP).

Atsushi Tanaka, MD, and colleagues from Wakayama University (Wakayama, Japan), categorized 43 consecutive ACS patients who underwent OCT into 2 groups: TCFA and no-TCFA. No baseline clinical or angiographic differences were present between the groups.

All patients underwent OCT for visualization of the entire culprit coronary artery using a novel non-occlusive (continuous-flushing) OCT technique. Using this technique, the researchers successfully observed the entire length of the culprit coronary arteries in all patients without any severe procedural complications. Twenty-one TCFAs were found in 18 patients (42%). Multiple plaque ruptures were found in 5 patients, all of whom were in the TCFA group (table 1).

Table 1. OCT Findings for Culprit Arteries

Variable	TCFA		
	Yes n=18	No n = 25	P Value
Thrombus	94%	92%	0.99
Plaque Rupture at Culprit Site	72%	60%	0.52
Multiple Ruptures	28%	0	0.009
Remote-Site TCFA	17%	0	0.07

The distribution of TCFAs in the right coronary arteries of patients was relatively even, whereas TCFAs in the left anterior descending artery were more common in proximal sites (proximal 6 [27%], mid 2 [9%], distal 0; $P=0.018$).

In addition, high-sensitive CRP was significantly higher in patients with TCFAs compared to those without (median 3.3 mg/L vs. 1.7 mg/L; $P=0.03$).

Of particular interest, the authors note, is that ordinary OCT is performed using a conventional balloon occlusion technique unable to image TCFAs in very proximal sites. The non-occlusive technique used here, on the other hand, led to the observation that TCFAs occurred more frequently in the proximal left coronary artery. Previous studies have shown that up to 90% of all TCFAs and ruptured plaques are located in the proximal 33 mm of the left coronary artery, the paper reports.

For cardiologists, “the detection of vulnerable plaques is a key goal for predicting and preventing the course of ACS,” the authors conclude. “The localization of TCFA and/or high high-sensitive CRP seen in this study may justify the use of [OCT] to search for TCFAs or ruptured plaques.”

Source:

Tanaka A, Imanishi T, Kitabata H, et al. Distribution and frequency of thin-caped fibroatheromas and ruptured plaques in the entire culprit coronary artery in patients with acute coronary syndrome as determined by optical coherence tomography. *Am J Cardiol* 2008;Epub ahead of print.