New hidden heart attack culprit identified in women

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Researchers at the Cardiac & Vascular Institute at NYU Langone Medical Center have identified a hidden culprit in the battle against women's heart disease. Plaque disruption, a rupture or ulceration of cholesterol plaque in a coronary artery, has been discovered as the mechanism behind myocardial infarction (heart attack) in some women without significant coronary artery disease (CAD) - that is, open rather than closed arteries on an angiogram. The study is published in the September 27th issue of the journal *Circulation*.

NYU Langone researchers investigated the origin of heart attacks in fifty women with open coronary arteries on angiography, using intravascular ultrasound (IVUS) and cardiac magnetic resonance (CMR) imaging. Researchers discovered that 38 percent of heart attacks in women with normal angiograms results originated from plaque disruption that could not be seen on an angiogram.

"For the first time our research findings show that disrupted plaque is the culprit behind heart attacks in many women who appear on an angiogram to have minimal or no coronary artery disease," said lead author Harmony Reynolds, MD, associate director of the Cardiovascular Clinical Research Center and assistant professor of Medicine in the Leon H. Charney Division of Cardiology at NYU Langone. "The findings show these women can essentially have a heart attack that is just like a heart attack in typical male and female patients whose coronary arteries do show blockage on an angiogram."

In the study, plaque ruptures were identified by the researchers in some artery segments that appeared completely normal on the angiogram, using intravascular ultrasound to visualize the artery walls in more detail than conventional angiography.

"Women who have had a heart attack and have normal or near-normal angiogram results may be told they didn't have a heart attack at all because of the angiogram result," said Reynolds. "Our study shows the benefit of additional imaging to find a plaque disruption when it occurs and correctly diagnose the reason for heart attack in these women."

Authors of the study stress these research results are important because many heart attack patients without angiographically obstructive coronary artery disease may go undiagnosed and not receive the necessary heart medications like anti-platelet drugs and statins - lifesaving tools against future cardiac events.

In the majority of heart attacks a completely or severely blocked artery is the culprit. Coronary artery disease in these cases is conventionally diagnosed by cardiologists through an angiogram procedure that shows doctors any current coronary artery blockages. However, it has been shown in the past that some heart attacks, particularly in women, have occurred even with fully open arteries and no angiographically significant coronary artery disease. This type of heart attack can occur when an artery becomes suddenly, severely or totally blocked due to a disrupted cholesterol plaque in the artery wall which leads to the formation of a dangerous blood clot. By the time of the angiogram in some cases of heart attack, the blood clot presumably has broken up, leaving the appearance of a normal or near-normal artery.

This study is the first prospective evaluation of IVUS and CMR imaging in women with sudden myocardial infarction without obstructive CAD at angiography. These imaging modalities can provide additional insights into the origins of this less common heart attack and may be useful in identifying future therapeutic targets.

"Myocardial infarction without CAD that appears to be significant on an angiogram is more common than many people think," said Dr. Reynolds.

"Patients and doctors both need to know there is a form of heart attack that can occur in which the arteries are not blocked on an angiogram. This is in fact a heart attack and steps need to be taken to prevent another cardiac event."

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