



Clinical Outcomes of Different Calcified Culprit Plaques in Patients with Acute Coronary Syndrome

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Abstract

Background: Previous research have observed that coronary artery calcification is carefully related to the prevalence of important unfavorable cardiac events (MACE). This take a look at aimed to research the traits and scientific consequences of various calcified plaques in sufferers with acute coronary syndrome (ACS) with the aid of using the use of optical coherence tomography (OCT).

Methods: 258 ACS sufferers with calcified offender plaques who underwent OCT-guided stent implantation have been enrolled. They have been divided into 3 subtypes primarily based totally at the calcified plaque morphology, along with eruptive calcified nodules, calcified protrusion, and superficial calcific sheet. Compared with superficial calcific sheet and calcified protrusion, eruptive calcified nodules had the finest calcium burden and a better price of stent aspect dissection ($p < 0.001$) and incomplete stent apposition ($p < 0.001$). In an average follow-up duration of two years, 39 (15.1%) sufferers skilled MACE (a composite occasion of cardiac death, goal-vessel myocardial infarction, ischemia-pushed revascularization), with a considerably better prevalence with inside the eruptive calcified nodules group (32.1% vs. 10.1% vs. 13.0%, $p = 0.001$). A multivariate Cox evaluation tested that the eruptive calcified nodules (threat ratio 3.14; 95% self belief interval, 1.64–6.02; $p = 0.001$) have been an impartial predictor of MACE.

Conclusions: MACE befell extra often in ACS sufferers with eruptive calcified nodules, and the eruptive calcified nodules have been an impartial predictor of MACE.

INTRODUCTION

In current years, research have observed that coronary artery calcification (CAC) is carefully related to the prevalence of important unfavorable cardiac events (MACE) [1,2]. Moreover, sufferers with seriously calcified lesions had poorer scientific consequences throughout and put up percutaneous coronary intervention (PCI), along with an expanded threat of coronary dissection, interventional failure, goal lesion revascularization, and long-time period mortality.

With the improvement of intravascular imaging, optical coherence tomography (OCT) can pick out the microstructures of calcified plaques with a decision of 10–20 μm . Sugiyama et al. Diagnosed calcified offender

plaques as 3 subtypes primarily based totally at the plaque morphology in sufferers with acute coronary syndromes (ACS) the use of OCT, along with eruptive calcified nodules, calcified protrusion, and superficial calcific sheet [3]. Subsequently, Nakajima et al. similarly as compared the put up-stent OCT findings amongst those 3 calcified offender plaque subtypes.

Research restrictions

This study has some limitations. First, as a retrospective multicenter cohort study, the results may not be generalized. Some clinicians may have known the history of the cancer and the treatment tailored to the patient. Second, OCT-guided PCI was implemented in all populations. Therefore, the outcome of patients not undergoing PCI or OCT due to

cardiogenic shock is unknown. Third, the small sample size of cancer patients has prevented us from assessing the impact of different cancer treatments (chemotherapy, radiation, or surgery) and different types of cancer on outcomes [4,5]. Fourth, the PR defined by OCT may be underestimated because the presence of residual thrombus limits the detection of fibrous cap destruction in OCT. In addition, it is sometimes difficult to detect fibrous cap destruction on the surface of nodular calcifications. Therefore, the CN defined in OCT is not yet fully established. These considerations justify future prospective observational studies that take into account the treatment status of cancer patients.

Section snippets

Clinical data collection and definition of cancer history

In addition to the patient and lesion characteristics at baseline, cancer status and treatment details, including past and present medical history, and whether the patient is currently suffering from the disease or completed treatment within a year. Or retroactively record whether the treatment was completed for more than a year. I had it a year ago [6,7]. We also collected post-ACS clinical event data before the endpoint occurred. Recorded clinical events include non-cardiac death, cardiac death, non-fatal myocardial infarction, and coronary artery blood circulation reconstruction (target lesion blood circulation reconstruction [TLR], target vascular blood circulation reconstruction [TVR], and non-TVR). , Stroke / transient ischemic attack, heart failure with onset. Cardiovascular events were identified through a review of medical records and confirmed through direct contact with the patient, his family, or a physician. Cardiac death was defined as death from a record of myocardial infarction, congestive heart failure, arrhythmia, or sudden cardiac death. Clinical endpoints are major adverse cardiovascular events (MACE: cardiac death, non-fatal MI, and coronary artery revascularization, stroke / transient ischemic attack, congestive heart failure on admission) and coronary arteries. Ischemic events (cardiac death, non-fatal MI complex, and coronary vascular regeneration) [8,9].

Differences in clinical outcomes after the onset of ACS due to cancer history

In this study, the incidence of MACE and coronary ischemic events after ACS was significantly higher in patients with a history of cancer (CCP and HCP) than in NCP. Previous studies have previously reported that cancer is associated with a significantly higher incidence of adverse cardiovascular events, including TLR, after PCI in patients with coronary artery disease 24,25. Cancer was higher than NCP, and patients with a history of cancer tended to have a higher incidence of TLRs and TVRs. The detailed mechanism of the relationship between cancer history and higher cardiovascular event rates remains unclear, but the presence of malignant tumors can exacerbate inflammation

of the vascular wall through the action of inflammatory cytokines. It can be speculated that it can cause progressive coronary atherosclerosis [10].

Harmonization of data standards in healthcare and clinical research

Clinical information models such as the Health Level 7 (HL7) Reference Information Model (RIM) use different terms than the research-oriented CDISC operational data model (ODM)³⁰. HL7 interoperability depends in part on the mapping of data elements to concepts. The standard term only considers ODM that the term can act as a source for the content of the data element. For example, the element "ICD9CM_Code" is filled with ICD-9-CM, Edition 2010 terminology. ODM does not support mapping the data items themselves (serum total cholesterol, systolic blood pressure, etc.) to terms. Therefore, while ODM is intended to support data exchange, it cannot solve mapping problems where semantically identical data items can have different names across different systems [11].

ACKNOWLEDGEMENT Methods:

Angiographic Analysis and Procedures

A quantitative coronary angiography evaluation became carried out the use of the Cardiovascular Angiography Analysis System (CAAS) model five.10 (Pie Medical Imaging B.V., Maastricht, The Netherlands). All offender lesion analyses have been carried out with the aid of using impartial investigators who have been blinded to the scientific information and OCT evaluation results. The reference vessel diameter, minimum lumen diameter, diameter stenosis, and lesion duration have been measured from end-diastolic frames and calibration the use of the catheter's tip Coronary waft became assessed consistent with the Thrombolysis in Myocardial Infarction (TIMI) Flow Grade . The lesion complexity became assessed the use of the American College of Cardiology/American Heart Association classification.[12,13] Calcification became diagnosed as effortlessly obvious radiopacities with inside the vascular wall on the web web page of the stenosis .

OCT Image Acquisition and Analysis

OCT imaging became carried out on the discretion of an interventional heart specialist the use of a commercially to be had frequency-area OCT system [6] (ILUMIEN OPTIS or OPTIS Integrated System, Abbott Vascular, Santa Clara, CA, USA). All OCT photos have been analyzed with inside the imaging middle laboratory with the aid of using skilled investigators who have been blinded to the sufferers' information. When there has been war of words among the investigators, a consensus analyzing became carried out with the aid of using a 3rd investigator. For sufferers with TIMI < 2 and occlusive thrombosis, guide thrombectomy became allowed earlier than OCT imaging [14,15]. The minimum lumen region became the minimum price of the

lumen region alongside the offender lesion. The common reference lumen region became described because the common of the most important lumen region on the proximal and distal ends of the stenosis with inside the five mm segment.

DISCUSSION

Classification of Calcified Plaque and Baseline Characteristics of Patients:

Previous research have summarized the analysis set of rules of calcified plaques in ACS sufferers for the primary time and divided calcified plaques into 3 subtypes: eruptive calcified nodules (25.5%); calcified protrusion (7.1%); and superficial calcific sheet (67.4%) [16]. The occurrence of the 3 subtypes in our take a look at became consistent with preceding observation. Eruptive calcified nodules and calcified protrusions have been maximum often determined in ACS sufferers with preceding myocardial infarction and continual kidney ailment. As Lee et al. reported, eruptive calcified nodules are frequently determined in sufferers with continual kidney ailment and intense CAC lesions with percutaneous coronary intervention. Patients with a cancer history had significantly worse clinical outcomes after the onset of ACS compared with NCPs. They also had significantly higher incidences of PE and CN in ACS culprit lesions, which might partly explain the worse clinical outcomes after the onset of ACS in patients with a cancer history.

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