Morphological plaque characteristics and clinical outcomes of acute coronary syndrome patients with a cancer history

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Background: Although previous studies have reported that patients with a history of cancer have 2–3 times higher risks for acute coronary syndrome (ACS), morphological culprit plaque characteristics in ACS patients with a cancer history and their relations with clinical outcomes remain unknown.

Methods: The Kobe University ACS-OCT registry is a multi-center registry of consecutive ACS patients who underwent OCT-guided emergent PCI in Japanese four centers. All patients were categorized into the patients without a history of cancer (non-cancer), those with a history of cancer who diagnosed more than one year before ACS (historical), and those with ongoing cancer treatment or diagnosis within one year before ACS (current). ACS culprit lesions were classified into plaque rupture (PR), plaque erosion (PE), and calcified nodule (CN) according to morphological features by OCT and clinical events were collected after the onset of ACS.

Results: Among 436 patients, 63 patients (14.4%) had a history of cancer or ongoing treatment of cancer (cancer patients). Cancer patients were significantly older than non-cancer patients (73.4±9.4 vs. 66.9±12.9, p=0.001), and non-ST segment elevation ACS was more frequently observed in cancer patients than in non-cancer patients (57.1% vs. 43.2%, p=0.039). Regarding the ACS culprit lesion, the frequency of PR was significantly lower and the frequencies of PE and CN were significantly higher in the cancer patients than in the non-cancer patients (Figure A1). The cumulative incidence of major adverse cardiovascular event (MACE: composite of cardiac death, non-fatal myocardial infarction, and any revascularization, stroke, and heart failure with admission) after the onset of ACS in cancer patients was significantly higher than that in the non-cancer patients (Figure B1). When the cancer patients were categorized into the historical and the current cancer patients, the frequency of PE was higher in the current and the historical cancer patients than the non-cancer patients. Also, the incidence of CN was significantly higher in the historical cancer patients than others (Figure A2). The cumulative incidence of MACE was significantly higher in the current cancer patients, followed by historical and non-cancer patients (Figure B2). Cox regression analyses demonstrated that the non-PR lesion (hazard ratio (HR) 0.65, 0.46–0.94, p=0.021), patients with multivessel disease (HR 2.55, 1.79–3.64, p<0.001), older patients (HR 1.02, 1.00–1.03, p=0.043) were independently associated with MACE after ACS. Moreover, multivariate analysis demonstrated that cancer history (HR 4.64, 2.34–9.21, p<0.001) and non-ST segment elevation ACS (HR 0.66, 2.34–9.21, p=0.038) were independently associated with non-PR lesion.

Conclusions: The present study revealed the difference in morphological plaque characteristics between cancer and non-cancer patients, which might explain potential underlying mechanisms for worse outcomes in cancer patients.

Figure A. Percentage of morphological plaque characteristics by OCT

1. Comparison between patients with and without a history of cancer

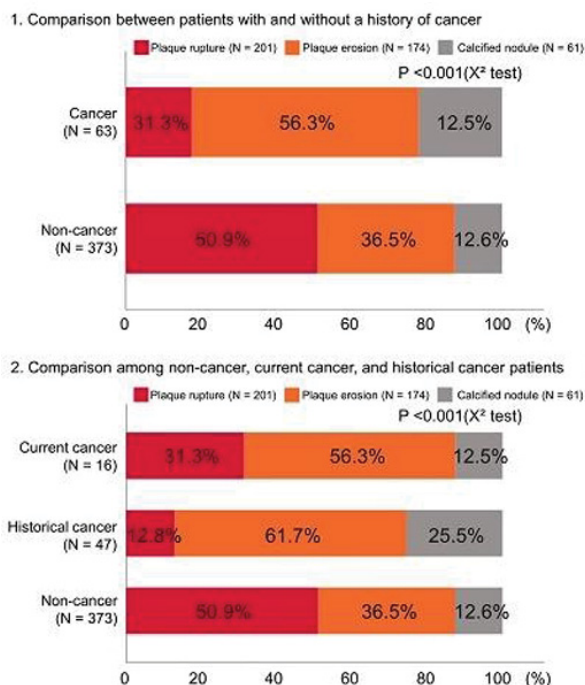2. Comparison among non-cancer, current cancer, and historical cancer patients

Figure B. The Kaplan–Meier curves showing the cumulative incidence of MACE according to cancer history.

1. Comparison between patients with and without a history of cancer

2. Comparison among non-cancer, current cancer, and historical cancer patients