Coronary Artery Aneurysm with Thrombus Evaluated by Multi-detector Row Computed Tomography

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Abstract

This is a case report of a 60-year-old woman with acute myocardial infarction (AMI) who had coronary aneurysms and thrombus in the right coronary artery detected by multi-detector row computed tomography (MDCT). In this case, MDCT was useful for clarifying the thrombus complicated with coronary aneurysms, which was considered to be the cause of AMI. Thus, warfarin was started as an anticoagulant therapy for thrombus.

Key words: multi-detector row computed tomography, acute myocardial infarction, thrombus, coronary aneurysms

Case Report

A 60-year-old woman was admitted to the hospital with acute-onset chest pain. She had no risk factors for CAD. She had experienced no episodes of connective tissue disease, infectious disease, trauma or Kawasaki disease. She was diagnosed as AMI based on ST elevation on initial electrocardiogram and elevated levels of creatine kinase. Invasive coronary angiogram revealed diffuse aneurysms in the right coronary artery (RCA), but the distal lesion in the RCA was not adequately enhanced because the RCA could not be filled with contrast media due to very large aneurysms (Fig. 1). Percutaneous coronary intervention (PCI) was not performed because of diffuse aneurysms, and thus aspirin and heparin were given for the conservative management of AMI. In addition, coronary angiography was performed using 64-MDCT (Aquilion 64, TOSHIBA, Tokyo, Japan), and the data were analyzed on a workstation (ZIO STATION, ZIO SOFT, Inc., Tokyo, Japan). A volume-rendered image showed coronary aneurysms in all three vessels (Fig. 2A, B), and a multi-planar reconstruction image showed a low-density area around the distal RCA, which was considered to be thrombus (Fig. 2C). Thus, warfarin was started as an anticoagulant therapy for thrombus.

Discussion

Coronary aneurysms are found in 0.3-5% of patients undergoing coronary angiography, and carry a risk of atherosclerotic coronary artery disease (CAD) such as acute myocardial infarction (AMI) and sudden death (1). In addition, atherosclerosis is the main cause of coronary aneurysms, followed by Kawasaki disease and infection. The main complications of coronary aneurysms are thrombosis, rupture and calcification (2). Recently, multi-detector row computed tomography (MDCT) has enabled the non-invasive detection of coronary arteries, especially those without calcification (3, 4). Improvements in spatial resolution have enabled visualization of the entire coronary tree with diagnostic image quality (5, 6). In this report, we describe a patient with coronary aneurysms with thrombus, and the usefulness of MDCT for determining the cause of AMI.

Coronary aneurysms in Japan are most commonly caused by Kawasaki disease (8). In this case, although the most likely underlying cause of coronary aneurysms was Kawasaki disease, the patient did not have an apparent history of Kawasaki disease characterized by fever of more than 5 days duration, conjunctivi-
Figure 1. Invasive coronary angiogram showed aneurysms in the RCA (A), LAD and LCX (B, arrows). The distal lesion in the RCA was not adequately enhanced because of proximal aneurysms (A, arrow heads). RCA, right coronary artery, LAD, left anterior descending; LCX, left circumflex.

Figure 2. (A-1, B) MDCT coronary angiogram showed coronary aneurysms in the RCA, LAD and LCX (arrows). (A-2) Total occlusion (white arrow) in the RCA (Seg. 3) and nonvisualization of the distal RCA (Seg. 4) were observed by MDCT. (C) A multi-planar reconstruction image of the RCA showed diffuse aneurysms (arrows) and a low-density area (arrow heads) around the vessel lumen, which was considered to be thrombus. MDCT, multi-detector row computed tomography.

tis, rash, cervical lymphadenopathy, erythema of the oral mucosa and edema of the hands/feet. Thus, our patient had not received antiplatelet drugs. Although thrombosis complicated with coronary aneurysm rarely occurs in patients with antiplatelet therapy, approximately 4% of cases develop coronary artery stenosis which leads to AMI, even if antiplatelet drugs are given (8). Since up to 20% of patients will develop coronary artery stenosis and may subsequently require treatment for myocardial ischemia including PCI, by-pass grafting and even cardiac transplantation during the natural course of coronary aneurysm (9), the risk of developing MI should be further increased if antiplatelet therapy is not given, as with this patient.

Invasive coronary angiography is still a standard diagnostic tool for the evaluation of coronary artery morphology in patients with coronary aneurysms. MDCT has been reported to provide high diagnostic accuracy for detecting coronary artery aneurysms, stenosis and occlusion (5, 6). MDCT can also detect coronary artery plaque or thrombus non-invasively, which could not be detected previously without a
very invasive tool such as intravascular ultrasound. In the present case, invasive coronary angiogram showed that the distal lesion in the RCA was not adequately enhanced because of diffuse aneurysms. On the other hand, MDCT could clearly detect the distal lesion in the RCA, and subsequently we found that the thrombus complicated coronary aneurysms, which led to AMI. Moreover, treatment with warfarin was selected based on the detection of the thrombus by MDCT angiogram.

In conclusion, MDCT angiography in this case was a much better tool for confirming the cause and culprit lesion of MI because of its non-invasive nature, and the observation of coronary arteries by invasive coronary angiography was unsatisfactory because of coronary aneurysms.

References