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Case Report
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Areca Nut Chewing Complicated with Non-Obstructive and Obstructive ST Elevation Myocardial Infarction

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Areca nut chewing is one of the most prevalent substance abuse habits in the world, and it is associated with the risk of a variety of medical challenges including hypertension, arrhythmia, and coronary artery disease (CAD). However, ST elevation myocardial infarction (STEMI) is an extremely rare complication of areca nut chewing. Herein we report two cases where patients suffered from STEMI after areca nut chewing. The first case involved a patient with non-obstructive CAD and non-sustained ventricular tachycardia during hospitalization. The second case revealed left circumflex artery total occlusion, and primary percutaneous coronary intervention was performed. Initially, the levels of arecoline and arecaidine plasma were checked in these two cases after admission. Although both cases revealed increased levels, the second case showed substantially higher values than the first case. In general, these two cases remind physicians that areca nut chewing may cause myocardial injury with different severity, although STEMI with true coronary obstruction remains an extremely rare but possible complication after areca nut chewing.

Key Words: Areca nut chewing • Coronary obstruction • ST elevation myocardial infarction

INTRODUCTION

Areca nut chewing is an exceedingly popular substance abuse habit worldwide, and it is associated with the risk of hypertension, metabolic syndrome, arrhythmia, and coronary artery disease (CAD), among other diseases.[1-5] However, ST elevation myocardial infarction (STEMI) is an extremely rare complication of areca nut chewing in the literature.[5,6] Herein we reported two cases where patients suffered from STEMI subsequent to areca nut chewing. However, different arecoline and arecaidine levels were detected and coronary angiography also revealed a different extent of coronary obstruction.

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CASE REPORT

Case 1

A 41-year-old male was seen at our facility with hypertension and a history of smoking. He came to our emergency department (ED) complaining of acute chest tightness after areca nut chewing and alcohol drinking for forty minutes. Upon arrival at our ED, his vital signs were: pulse rate 94 beats/min, respiratory rate 16/min, and blood pressure 104/72 mmHg. An initial electrocardiogram (ECG) revealed ST elevation over leads II, III, and aVF (Figure 1A). Because the medical staff strongly suspected STEMI, emergency coronary angiography was

arranged. However, the result indicated only a non-obstructive lesion over the right coronary artery. Thereafter, the patient was transferred to our cardiac care unit (CCU), where non-sustained ventricular tachycardia (VT) occurred several times but did not lead to obvious hemodynamic change (Figure 1B). Arecoline and arecaidine levels were checked to detect recent betal nut use; the results showed positive findings but merely mild elevation (arecoline: 2.11 ng/ml, arecaidine: 2.53 ng/ml). Cardiac biomarkers also peaked in the form of creatine kinase-MB: 40.6 IU/L and troponin I: 6.7 ng/mL. After the patient received medical treatment for six days, the patient was discharged uneventfully from the hospital. Later ECG follow-up revealed normal findings with completely resolution of ST elevation over inferior leads (Figure 1C).

Case 2

A 48-year-old male was seen at our facility who first denied any systemic disease and history of prior smok-

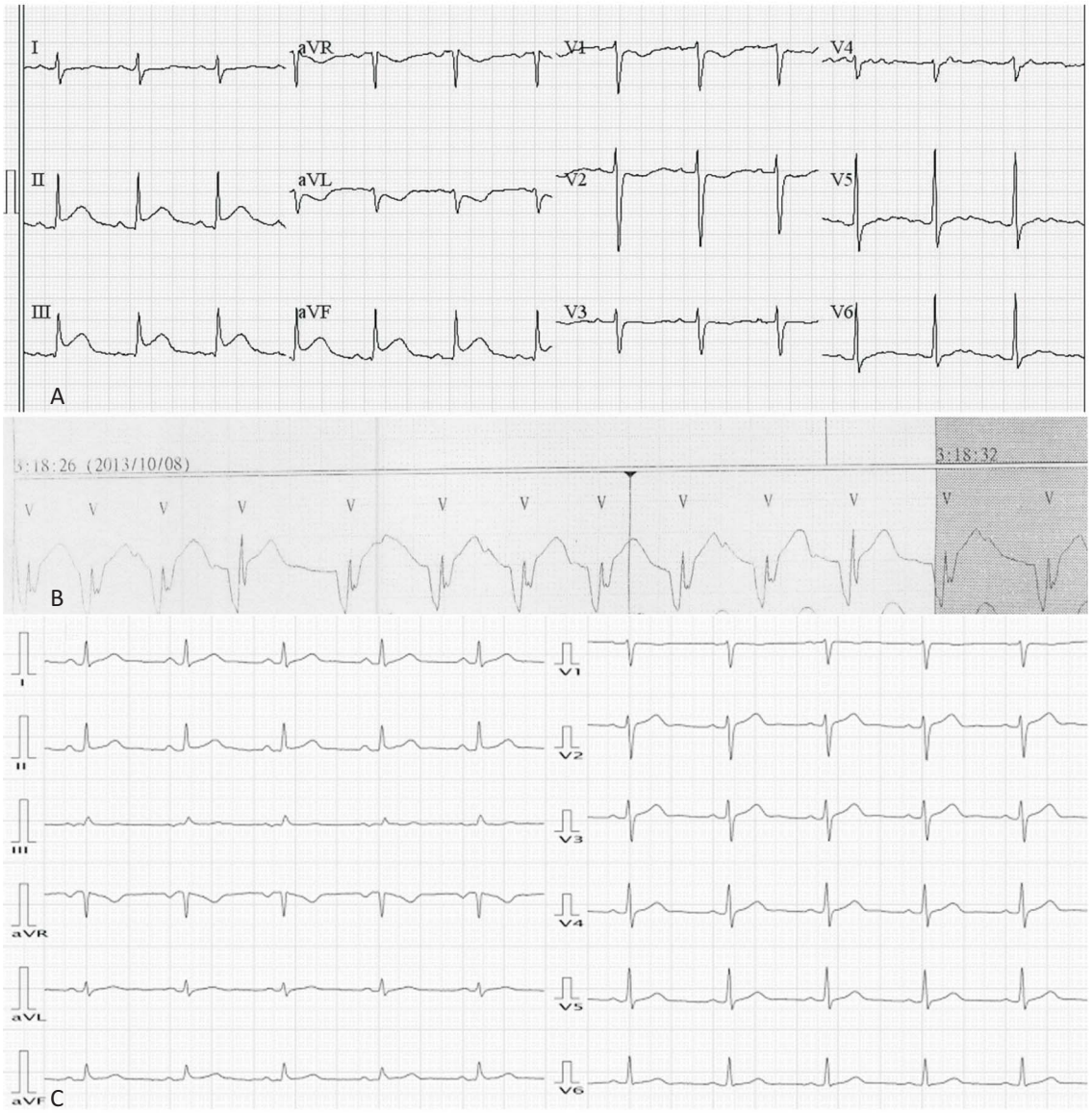

Figure 1. *Case 1: Initial electrocardiogram (ECG) revealed ST elevation over leads II, III, and aVF (A). Non-sustained ventricular tachycardia occurred on the patient several times during cardiac care unit stay (B). ECG follow-up later revealed normal finding with complete resolution of ST elevation over inferior leads (C).*

ing. He suffered from acute chest pain after areca nut chewing for thirty minutes and was brought to our ED. On arrival,vital signs were as follows: pulse rate 71 beats/min, respiratory rate 18/min, and blood pressure 101/71 mmHg. Initial ECG revealed ST elevation over leads II, III, aVF and V5-V6 (Figure 2A). Working with a preliminary diagnosis of STEMI, primary percutaneous coronary intervention (PCI) was performed. Emergency coronary angiography showed total occlusion of the left circumflex artery (LCX) (Figure 2B), and 50% stenosis of the proximal right coronary artery. Thrombus aspiration and stenting was performed over LCX, and TIMI 3 flow was restored (Figure 2C). Follow-up ECG also revealed resolution of ST segment elevation and Q wave in lead III and aVF (Figure 2D). Arecoline and arecaidine levels were checked and the results revealed extremely elevated values (arecoline: 11.2 ng/ml, arecaidine: 655 ng/ml). Cardiac biomarkers also demonstrated an early peak in the form of creatine kinase-MB: 202.9 IU/L and troponin I: 41 ng/mL. After PCI and optimal medical treatment, the patient was discharged in stable condition.

DISCUSSION

Areca nut is widely consumed in many countries around the globe, but especially in the southeast Asian region. It is the fourth most popular substance abuse habit in the world and has been reported to be associated with hypertension, metabolic syndrome, obesity, arrhythmia, and CAD in previous studies.[1-5] In addition, there is strong evidence for carcinogenicity of areca nut in oral and esophagus cancers.[7,8] Areca nut can affect several systems of the human body, including the nervous, cardiovascular, and gastrointestinal systems.

For the cardiovascular system, areca nut usage can induce adrenal cromaffin cells to release catecholamines.

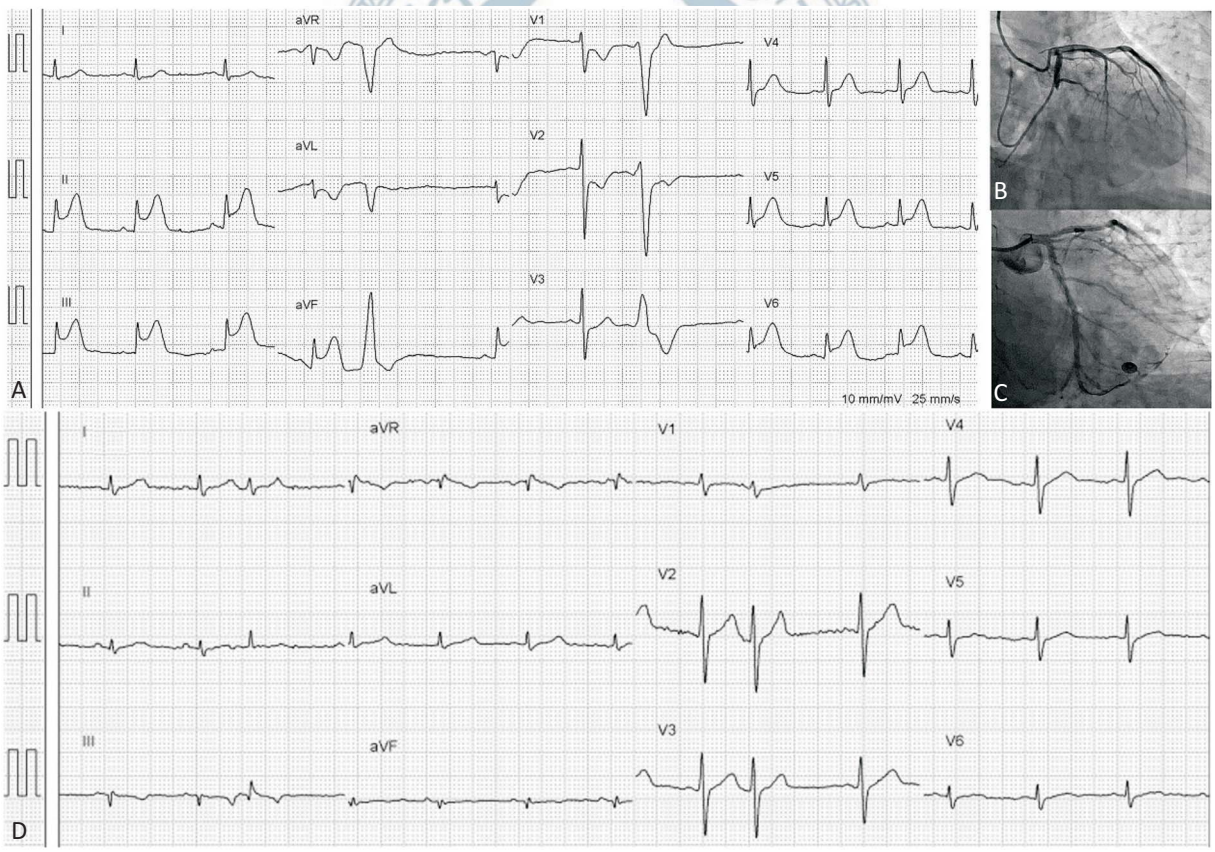

Figure 2. *Case 2: Initial ECG revealed ST elevation over leads II, III, aVF and V5-V6 (A). Emergent coronary angiography showed left circumflex artery (LCX) total occlusion (B). Thrombus aspiration and further stenting was performed over LCX and TIMI 3 flow was restored (C). Follow-up ECG revealed resolution of ST segment elevation and Q wave in lead III and aVF (D).*

This can in turn also inhibit the uptake of low-density lipoprotein and has a blocking effect on high-density lipoprotein receptors which may lead to atherogenesis.[9] In addition, it also has parasympathomimetic effect which may cause spasm of the coronary arteries.[6] However, STEMI is a very rare complication after areca nut chewing.[5,6] Chou et al. reported the case of a patient suffering from STEMI and ventricular fibrillation after chewing inverted nut (Pinang-Wang).[5] Emergency coronary angiography revealed normal coronary arteries and high plasma concentrations of arecoline and arecaidine (10.1 ng/ml and 183 ng/ml, respectively) were noted. The cause of ST elevation was suspected to be related to coronary spasm and transthoracic defibrillation. Hung et al. also reported a case of acute myocardial infarction (AMI) temporally related to areca nut chewing. In that case, coronary artery spasm but not true occlusion was considered as the cause of AMI.[6]

Arecoline and arecaidine are two main alkaloids of the areca nut. Pinang-wang and areca nut are from the same areca nut tree, but pinang-wang grows in a different direction on the same spadix, with higher alkaloid concentrations and therefore more severe clinical effects.[5] Although it is difficult to differentiate pinang-wang or areca nut use in our two cases, to our knowledge, our second case may represent the first published example of obstructive STEMI after areca nut chewing with proven elevated arecoline and arecaidine levels. In this case, the patient denied the presence of systemic disease as well as any history of smoking. Therefore, the most possible scenario for LCX acute occlusion may be related to cardiac toxicity arising from areca nut chewing, causing possible unstable plaque rupture. In addition, the patient in our first case suffered from non-sustained VT several times, which might also be related to the toxicity of areca nut chewing.[5] Compared with the previous case presented by Chou et al.,[5] our case had relative stable non-sustained VT episode without obvious symptoms and unstable hemodynamic. Arecoline and arecaidine levels in our case were also lower than comparable levels in their case, which might imply a different severity of cardiac arrhythmia and outcomes between these two cases. Although our first case also had a history of past smoking, the habit did not have any obvious association with cardiac arrhythmia and the angiographic finding only revealed non-obstructive lesion. These findings suggest that the VT episode should be related to the areca nut chewing which is similar to previous literature.[5]

Although our two cases showed the different serum arecoline and arecaidine levels, according to the existing literature, we do not have sufficient evidence to manifestly prove that higher arecoline and arecaidine levels are associated with poorer cardiovascular events. However, the positive serum arecoline and arecaidine levels did provide the necessary evidence of recent areca nut use in our two cases.

CONCLUSIONS

These two cases should remind physicians that areca nut chewing may cause myocardial injury of differing severity, and that STEMI with true coronary obstruction is still an extremely rare but possible complication after areca nut chewing.

CONFLICT OF INTERESTS

Non declared.

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