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RESEARCH ARTICLE

VENTRICULAR EXTRASYSTOLES AFFECT THE DIAGNOSISTIC VALUE OF CORONARY COMPUTED TOMOGRAPHY ANGIOGRAPHY IN A PATIENT WITH ANGINA PECTORIS

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ABSTRACT

A 42-year-old male patient with a history of chest pain presented to the emergency room our hospital. MSCT angiography was performed using a 256-slice computed tomography (CT). The MSCT angiographic analysis showed a total occlusion of the medial left anterior descending artery (LAD) after the 2nd diagonal branch. An urgent coronary angiography performed later the same day, it excluded a significant coronary artery disease. Conclusion: In patients with tachykardia and arrhythmias, image quality is frequently affected by motion artefacts, limiting ist utility. Ventricular Extrasystoles can decrease image quality of coronary computed tomography.

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INTRODUCTION

Multi-slice CT (MSCT) has gained acceptance as an accurate non-invasive method to evaluate coronary arteries. At present, it appears that the greatest utility of cardiac MSCT lies in being a sensitive non-invasive method to rule out coronary artery disease (CAD) (Ghostine *et al.,* 2006; Leber *et al.,* 2007; Achenbach *et al.,* 2001; Nieman *et al.,* 2002; Sun and Jiang, 2006; Pugliese *et al.,* 2006; Meijboom *et al.,* 2007). Of course, there are limitations as compared with the invasive angiogram: Limited temporal resolution can reduce image quality, especially if heart rates are above 70 beats per minute (Leschka *et al., 2006*; Hoffmann *et al.,* 2005; Herzog *et al.,* 2006; Scheffel *et al.,* 2006; Ropers *et al.,* 2007; Giesler *et al.,* 2002) .This limitation may not be as pronounced for the newer dual-source CT scanners. Since data acquired over several heartbeats are necessary to acquire a complete data set, coronary CT angiography (CTA) is not reliably possible in patients with arrhythmias (Lee *et al.,* 2012). Many studies that have compared the cardiac catheterization and coronary CT angiography (CTA) have enrolled patients with heart rates above 70 beats per minute or with atrial fibrillation (Leschka *et al.,* 2006; Hoffmann *et al.,* 2005; Herzog *et al.,* 2006; Scheffel *et al.,* 2006; Ropers *et al.,* 2007; Giesler *et al.,* 2002; Lee *et al.,* 2012), but no study have enrolled patients with ventricular extrasystolies.

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Case presentation

A 42-year-old male patient with a medical history of hypertension for several years presented to the emergency room (ER) with a history of chest discomfort occurs with physical activitis and occasionally at rest since 4 weeks, associated with shortness of breath. A physical examination showed blood pressure of 145/80 mmHg, heart rate of 88 bpm, BMI of 33 kg/m², clear lungs, first and second heart sounds without additional sounds or murmurs, good peripheral perfusion and no edema. The ECG (electrocardiogram) demonstrated sinus rhythm, HR (heart rate): 80 bpm, bigeminy, without significantly ischemic changes (Fig. 1). His initial troponin level measured 0,00 ng/ml, D-Dimer was negativ, with no other abnormalities shown on initial laboratory results. The patient was kept overnight for observation. The echocardiogram revealed a normal systolic ejection fraction of 70% without wall motion abnormalities. The second control of troponin and ECG (6 hour post admission) with no other abnormalities shown on initial laboratory results and ECG. Consequently, we decided to study his coronary arteries non-invasively. MSCT angiography was performed using a 256-slice Siemens computed tomography (CT). The MSCT angiographic analysis showed a total occlusion of the medial left anterior descending artery (LAD) after the 2nd diagonal branch (Fig. 2). An urgent coronary angiography performed later the same day, it excluded a significant coronary artery disease (Fig. 3).

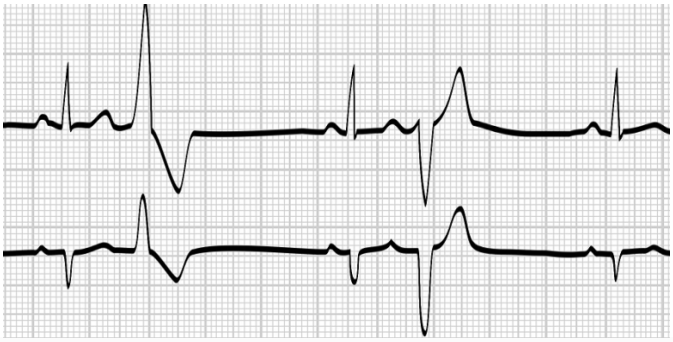

Fig. 1. ECG shows bigeminy

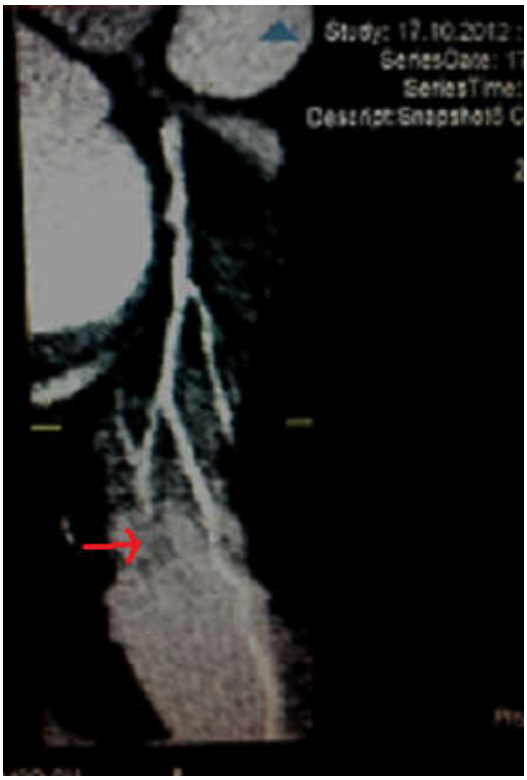

Fig. 2. A total occlusion of the medial LAD after the 2nd diagonal branch

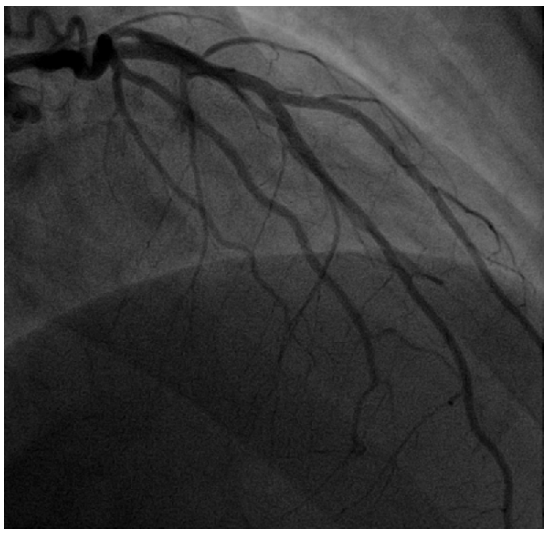

Fig. 3. A coronary angiography shows a normal LAD

Conclusion

In patients with tachykardia and arrhythmias, image quality is frequently affected by motion artefacts, limiting ist utility. Ventricular Extra systoles can decrease image quality of coronary computed tomography. Coronary angiography is still the main method for detecting coronary artery disease (CAD) in patients with ventricular extra systoles.

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