Myocardial infarction: evaluation with multislice spiral CT
Published on 18.02.2003

DOI: 10.1594/EURORAD/CASE.2075
ISSN: 1563-4086
Section: Cardiovascular
Imaging Technique: CT
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Case Type: Clinical Cases
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Patient: 52 years, male

Clinical History:

The patient presented with increasing chronic thoracic and abdominal pain and progressive dyspnoea.

Imaging Findings:

The patient presented with increasing chronic thoracic and abdominal pain and progressive dyspnoea. He had a family history of ischaemic cardiopathy and his blood examinations showed an increase in cholesterol, LDK and CKmb. After ECG and echocardiography examinations he underwent spiral CT pre- and post- administration of contrast material. This showed a coronary calcification and a hypodense area located at the level of the interventricular septum.

Discussion:

The diagnosis and treatment of acute myocardial infarction (AMI) in the operational setting can be both difficult and challenging. The underlying principle in the treatment of AMI should be rapid stabilisation and the earliest possible transfer of the patient to a medical facility with the appropriate intensive care/cardiac care and support capabilities. Maximum effort should be made to ensure, whenever possible, that the patient with AMI is electrically and haemodynamically stable and pain free before transfer. Treatment of cardiac arrest or haemodynamically significant arrhythmias should follow the advanced cardiac life support (ACLS) guidelines.

The diagnosis of AMI is primarily based on an appropriate clinical history. The clinician must maintain a high index of suspicion when a patient complains of chest discomfort. This may vary considerably in character, but usually lasts for more than 30 minutes. The discomfort is generally described as a severe retrosternal squeezing, choking, or heavy pressure sensation. It may radiate to the shoulders, down the ulnar aspect of the left arm, and into the neck or jaw. The patient will often report associated diaphoresis or shortness of breath. A history of previous chest discomfort on exertion can often be elicited.

During the physical examination particular attention should be paid to the pulse, blood pressure, respiratory rate, and signs of heart failure including elevated jugular venous pulse, rales on chest auscultation, the presence of an S3 gallop sound, or the development of a new heart murmur on cardiac examination. Serial 12-lead electrocardiogram (ECG) monitoring is helpful in establishing the diagnosis of AMI, but the presence of an initially normal ECG does
not exclude the diagnosis. Serial creatinine kinase (CK) determinations should be obtained every 6 to 8 hours. If laboratory facilities are not available, serum should be collected, spun down, if possible, and kept on ice until sent with the patient at the time of transfer. Spectral cards for qualitative measurement of myoglobin, CKMB and troponin may sometimes be available. A right-sided V4r lead ECG recording is essential in all patients with suspected AMI as it will allow diagnosis of RV infarction. In the case of a right ventricular (RV) infarct, hypotension may be a problem when nitroglycerin is administered, and may require 35 litres of fluid in the first 24 hours.

All patients with diagnosed or suspected AMI should be placed on a continuous ECG monitor (one lead is sufficient) with a large bore intravenous line established. All patients should be placed on supplemental oxygen. Patients should chew at least 160mg aspirin and then be treated with 325mg aspirin orally each day. Blood pressure should be monitored every 5 minutes until stable and then hourly. The patient should be placed on complete bed rest. In the absence of contraindications, patients should receive beta-blockers. Metoprolol can be given intravenously in 3 separate 5mg doses. Then give 50mg orally every 6 hours or a dose of 1-3mg of IV propranolol followed by 60-80mg PO TID. If an IV preparation of atenolol is not available, begin the oral dosing. Atenolol 50mg BID PO can alternatively be used.

Imaging, of course, is not a primary examination in the diagnosis of AMI, but it can give information about the extent of the lesion and it is very useful to detect complications such as, for example, post-infarct aneurysm. With the advent of multidetector spiral CT, new possibilities in the examination of myocardial and vascular disease have opened up. In fact, as shown by this case, spiral CT is highly capable of detecting calcification of the coronary arteries on unenhanced images and, after administration of contrast agent, it can evaluate the perfusion of the myocardium, thus providing a valuable estimate of the myocardial infarct.

**Differential Diagnosis List:** Myocardial infarction

**Final Diagnosis:** Myocardial infarction

**References:**


Figure 1

Description: Unenhanced spiral CT detects coronary calcifications. Origin:
Description: Enhanced CT scan during the arterial phase shows a hypodense area in the interventricular septum. Origin:
**Description:** Enhanced CT scan during the arterial phase shows a hypodense area in the interventricular septum. **Origin:**