

# The role of coronary calcium score in predicting myocardial infarction

## Morning well, afternoon hell

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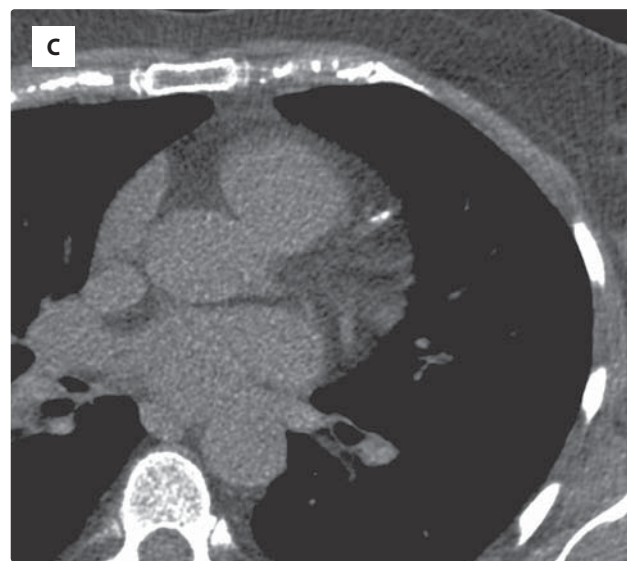
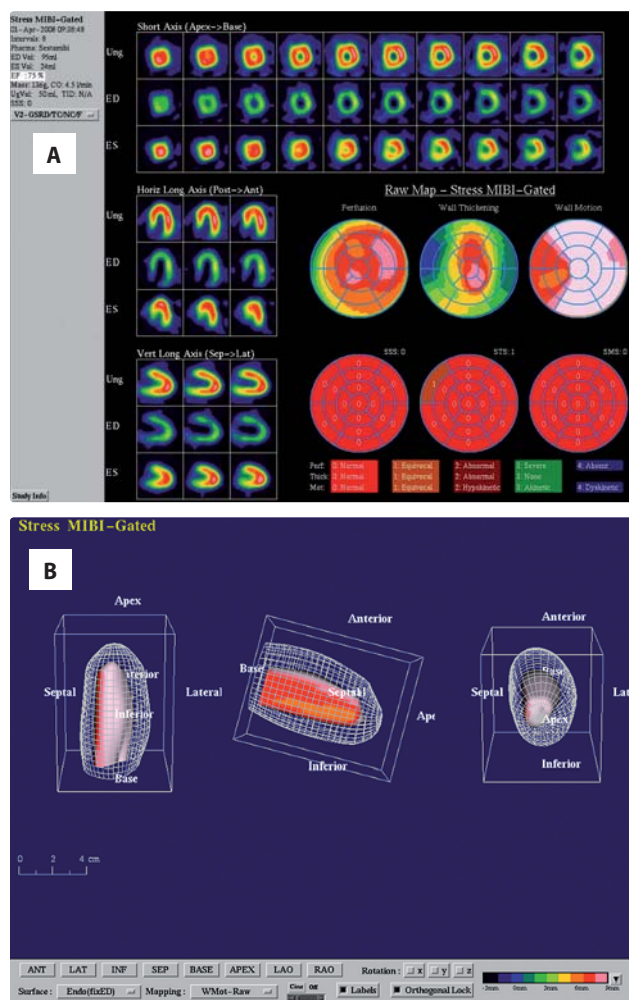
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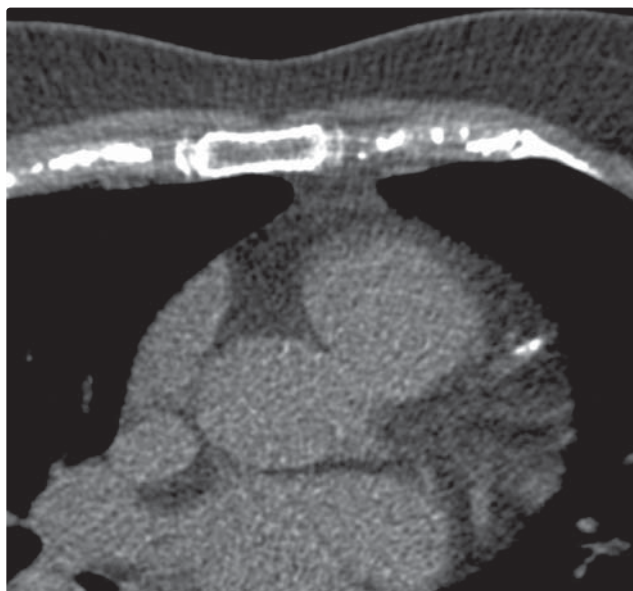
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Coronary artery calcium (CAC) score could be very useful in predicting myocardial infarction or cardiac death, in particular amongst those who are at intermediate risk of coronary events or in diabetic patients. Coronary artery

calcium has been shown to be a better predictor of cardiovascular events than carotid intima-media thickness. Combining SPECT with CAC improves sensitivity and specificity for the detection of significant coronary artery



**Figure 1** A 53-year-old woman without symptoms made an appointment for a preventive examination due to her positive family history (her father had a myocardial infarction at the age of 55) in the year 2008. She had a history of arterial hypertension, received beta-blockers and was a smoker. Physical examination: BP 180/100, heart rate 78, without any pathology. Laboratory: serum cholesterol level 6.08 mmol/l, ApoB 0.89 mmol/l, HDL-cholesterol 1.78 mmol/l, LDL-cholesterol 4.0 mmol/l, Lp(a) 0.024 mmol/l, glucose 5.6 mmol/l, fibrinogen 4.58 mmol/l. Within our study "CVD and relatives"<sup>1-8</sup> she had an echo exam with normal systolic left ventricular function and SPECT with normal heart perfusion (Figures 1A, 1B).<sup>4,5</sup> The coronary artery calcium score (Figure 1C) showed only small calcification on the left descending artery (LAD) (Agatston score 15). ACE inhibitors and a statin were recommended.



**Figure 2** The patient reported for her yearly follow-up examination in the morning of 6 April 2009. She did not complain of any cardiac symptoms. Her medication consisted of a beta-blocker, statin, ACE inhibitor, and moxonidine. The patient had not stopped smoking. Physical examination: BP 130/80, heart rate 65, without any pathology. Laboratory: serum cholesterol 4.94 mmol/l, ApoB 0.83 mmol/l, HDL-cholesterol 1.53 mmol/l, LDL-cholesterol 3.01 mmol/l, Lp(a) 0.357 mmol/l, glucose 5.1 mmol/l, fibrinogen 4.7 mmol/l. Her risk score (SCORE) was 2–3%. The CAC score showed a small calcification on the LAD (Agatston score 32).

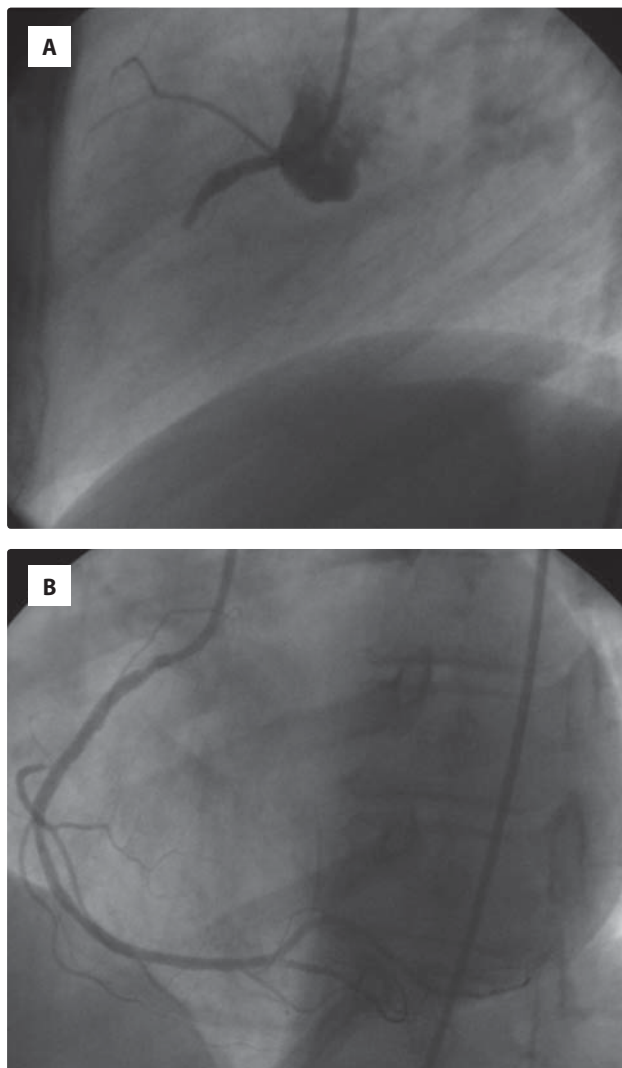
disease (CAD). The National Education Program Adult Treatment Panel III guidelines recommend CAC score as an option for advanced risk assessment in appropriately selected individuals.

The absence of a positive CAC score or a mild CAC score does not exclude the occurrence of myocardial infarction.

We present the case of a 53-year-old woman with an intermediate coronary risk score (smoking, hypertension, lipid disorders, positive family history), on medication (beta-blockers, ACE inhibitors, statins), who had only a mildly positive CAC score (Agatston 32), with a small calcification on the left coronary artery in an exam in the morning and had an acute myocardial infarction on the right coronary artery in the afternoon.

## References

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**Figure 3** In the same afternoon, she experienced chest pain and visited a doctor in another hospital. There were signs of acute myocardial infarction of the inferior wall on the ECG and the patient was sent to the University Hospital in Olomouc for acute PCI. Defibrillation was necessary in light of ventricular fibrillation at the time of the myocardial infarction. Figure 3A depicts the zero blood flow in the right coronary artery and Figure 3B the result of the PCI-induced TIMI 3 flow in the right coronary artery. This case report confirms the theory that the CAC score may miss soft plaques playing an important role in acute coronary syndrome. The MESA study revealed that 4% of patients with a zero CAC score may have significant coronary obstruction.<sup>9</sup>