
Clinical vignette

Acute myocardial infarction and cardiac perforation on non-gated CT

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A 79-year-old man was referred to emergency department for vague abdominal pain. In the past, the patient had cardiac arrhythmias necessitating a pacemaker placement. On admission, the patient had a normal auscultation and the abdomen examination was unremarkable. Postero-anterior chest radiograph revealed normal cardiac size and a small left pleural effusion. CRP, isotroponin were within normal range. EKG revealed a complete block in relationship with the pacemaker stimulation.

Multislice spiral CT (MX 8000, Philips Medical Systems, Cleveland, OH) of the chest and abdomen was performed 35 s after injection of 120 mL of non-ionic contrast medium with the following parameters: 4 × 5 mm slice thickness, 5 mm interval reconstruction, 0.5 s rotation time, 120 kV, 150 mAs, and no ECG gating.

The patient suddenly shocked and a prompt resuscitation was performed 10 min after completion of the CT examination. Transoesophageal ultrasound showed a massive haemopericardium. The patient died and an autopsy was performed.

Analysis of CT slices on a workstation revealed a heavily calcified LAD (Panel A) and lack of enhancement of the anterior portion of the inter-ventricular septum (Panel B), consistent with a large acute myocardial infarction. Although, image resolution was limited for accurate analysis of coronary anatomy, segmental hypoperfusion was clearly visible in the LAD perfusion territory and was highly suspicious for an acute coronary syndrome in this area. Axial CT images obtained at lower part of the heart demonstrated the course of the pacemaker lead across the right atrium, the right ventricle, and abutting against the inter-ventricular septum (Panel C).

Pathology specimen revealed a complete thrombosis of the initial portion of the LAD (Panel D) with mural calcifications, a haemorrhagic infiltration of the inter-ventricular wall with an early transmural infarction (Panel E) and perforation of the tip of the left ventricle (Panel F). Convergence of pathology and CT findings were consistent with acute perforation owing to pacemaker lead.

Panel A. Axial transverse CT image (WL: 400 HU, WW: 1300 HU) obtained at the level of aortic root shows heavily calcified LAD coronary artery (straight arrow) masking the underlying thrombosed vessel. The pacemaker lead is seen in the superior vena cavae (curved arrow).

Panel B. CT Images obtained at the level of heart shows sharply demarcated area of decreased enhancement in inter-ventricular septum (straight arrow) consistent with acute myocardial infarction. The pacemaker lead is going from the right atrium into the right ventricle (curved arrow). Moderate pleural effusions are present on both sides.

Panel C. Thin-slab maximal intensity projection CT images obtained at the level of lower part of the heart demonstrates the course of the pacemaker lead across the right atrium, the right ventricle, and abutting against the inter-ventricular septum (curved arrow).

Panel D. Histologic specimen revealed a complete thrombosis (th) of the LAD. A plaque with a large haemorrhagic lipid necrotic core (NC) and focal calcification (arrows) is seen at low power.

Panel E. Macroscopic specimen of the heart (short axis) shows a haemorrhagic infiltration (straight arrow) of the inter-ventricular wall consistent with an acute myocardial infarction.

Panel F. Macroscopic specimen of the heart revealed perforation of the inter-ventricular septum and tip of the left ventricle.