

# Cardiac metastasis presenting with an ischaemic electrocardiogram pattern mimicking anterior myocardial infarction

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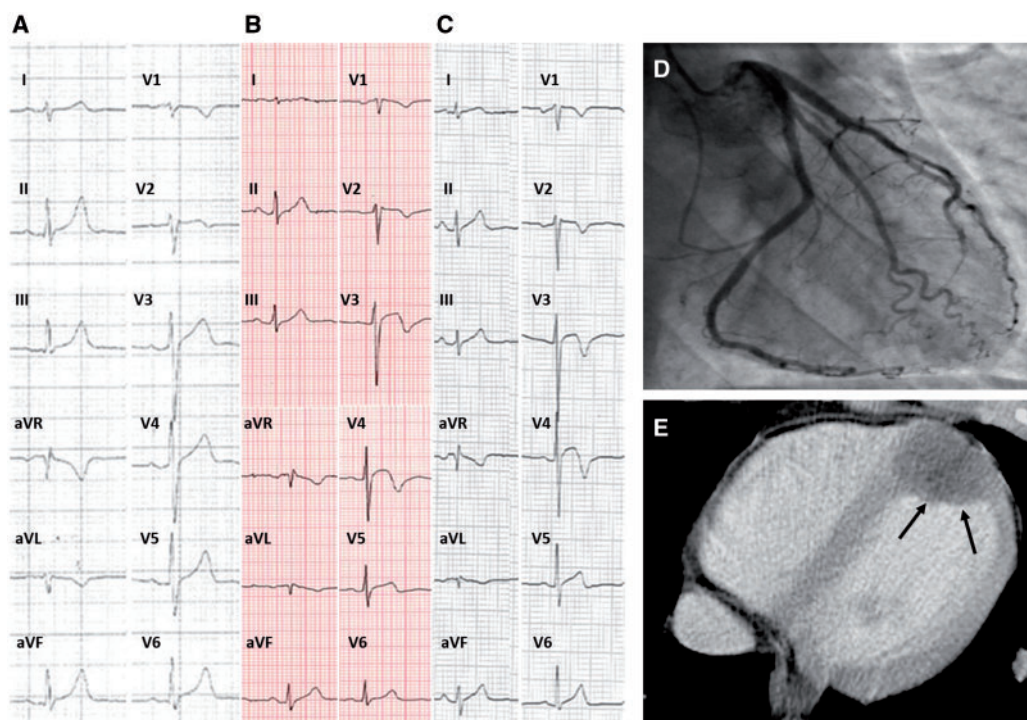
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## Case summary

A cardiac metastasis from a squamous cell carcinoma of the nasal cavities presented with an electrocardiogram showing ST-segment elevation and T-waves inversion in the anterior leads.

## Case description

A 48-year-old man was diagnosed in 2013 with squamous cell carcinoma of the nasal cavities and underwent surgical and radiotherapeutic treatment. In 2016, later recurrence was treated again with

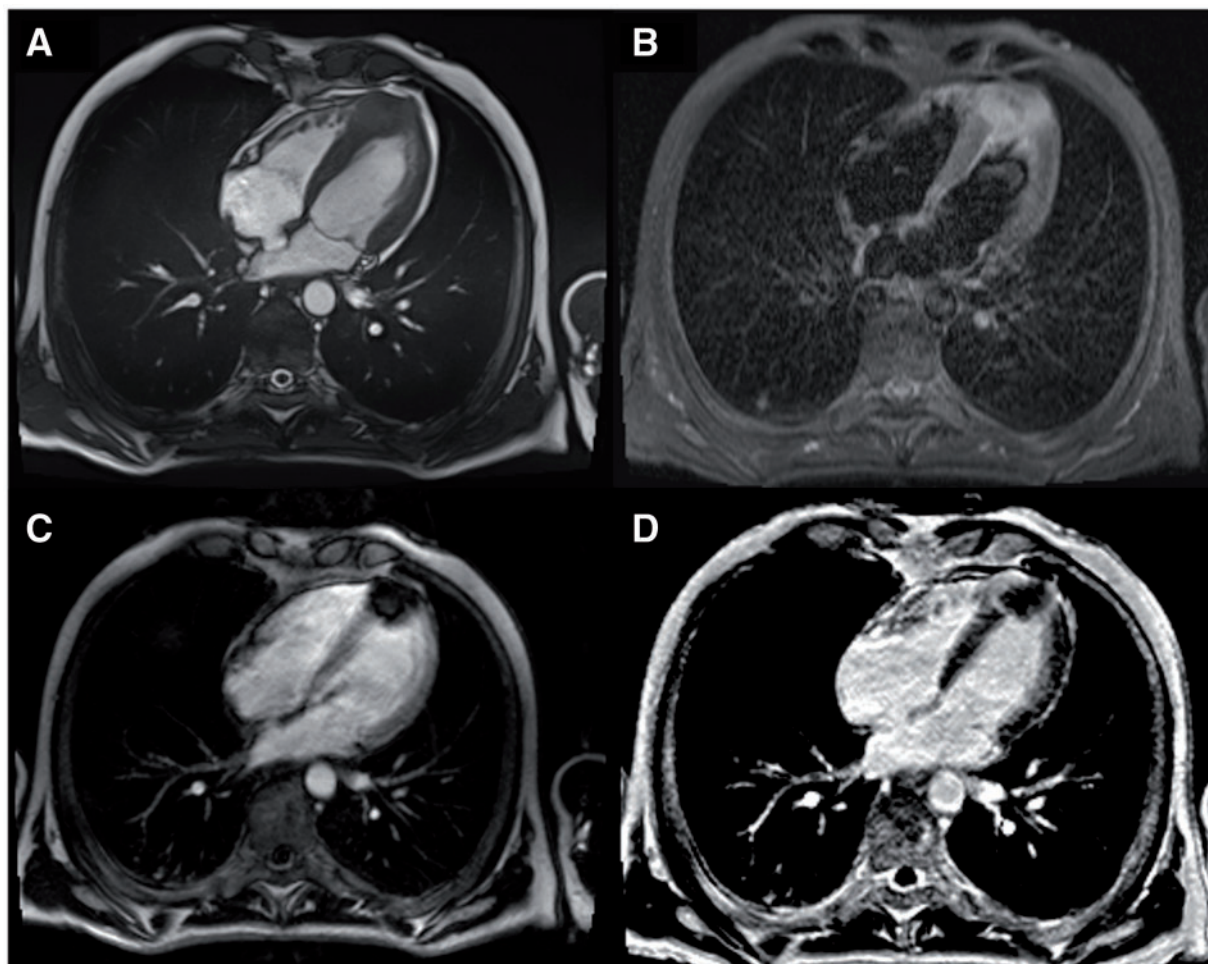


**Figure 1** Normal electrocardiogram (ECG) from 2016 (A). At presentation (March 2017), the patient presented an ECG with abnormalities mimicking anterior myocardial infarction (B), unchanged at repeated observations (C). Angiography of the left coronary artery showed no obstructive lesions (D). Axial slice of computed tomography in soft tissue window with evidence of a mass in the apex of the left ventricle (arrows) (E).

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**Figure 2** Panel of cardiac magnetic resonance images. Four-chamber view showing the left ventricle apical mass (A); hyperintense signalling in the T2-weighted image (B); no vascularization of the mass at early gadolinium image (C, early gadolinium scan, TI 500 ms); metastasis showing a dark core and an enhanced border at late gadolinium sequence (D, late gadolinium scan, TI 300 ms). TI, inversion time.

radiotherapy and chemotherapy (first with cisplatin, and then with a regimen of cisplatin, 5-fluorouracil, and cetuximab), with no response. At the beginning of February 2017, a computed tomography (CT) study showed metastases to lungs, psoas muscle, and hyoid apparatus. A new therapy with methotrexate was then initiated. In this setting, the electrocardiogram (ECG) was normal (Figure 1A).

In March 2017, the patient was hospitalized for jaundice, and a new pancreatic lesion was detected. Routine admission ECG showed ST-segment elevation and T-waves inversion in the anterior leads (Figure 1B). The patient never suffered chest pain. Cardiac and thoracic examinations were unremarkable, and a fast cardiac ultrasound showed preserved ejection fraction with only a mild apical hypokinesia.

Given the suspicion of myocardial infarction, a coronary angiogram was performed but revealed patent epicardial coronary arteries (Figure 1D).

Serial ECGs remained unvaried (Figure 1C) and cardiac troponin values were always negative.

Days after, the patient underwent a thoraco-abdominal CT study. Known nodules appeared greater, new ones were identified in the liver, and moreover another lesion was detected in the apex of the left ventricle (Figure 1E). A cardiac magnetic resonance study confirmed the cardiac metastasis, which appeared surrounded by oedema and not vascularized (Figure 2). Due to the already poor prognosis, the patient was kept on the same therapy scheme started prior the discovery of the cardiac metastasis, and clinically followed up.

Cardiac metastases are rare and frequently clinically silent<sup>1</sup>; however, in a minority of cases they may present with ECG alterations, ranging from rhythm abnormalities to ST-T segment modifications.<sup>2,3</sup> In neoplastic patients, even with a cancer not commonly involving the heart as site for secondarism,<sup>1</sup> an ischaemic ECG pattern not following its typical progression, without typical symptoms of ischaemia and without troponin abnormalities, should rise the suspicion of a cardiac metastasis. Even if no clear causative mechanisms for ECG abnormalities seen with cardiac metastases have been found since, it can be speculated that, at least in this very case, ECG findings may be

secondary to a compression of the left anterior descending artery. The metastasis in our patient was in fact identified in this coronary artery territory, though no clear anatomical relation was seen on angiography nor with other imaging techniques. A metabolic effect due to the compression in the absence of necrosis of the surrounding myocardium may account for ECG alterations without troponin rise.

**Consent:** The author/s confirm that written consent for submission and publication of this case report including image(s) and associated text has been obtained from the patient in line with COPE guidance.

**Conflict of interest:** none declared.

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