Not all T wave inversions are ischaemic

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DESCRIPTION

A 52- year-old man was referred as a case of acute coronary syndrome (ACS) for he had chest pain, vomiting and deep T wave inversions on ECG. Physical examination was normal except for blood pressure of 190/100 mm Hg. ECG (figure 1) satisfied voltage criteria for left ventricular hypertrophy along with deep asymmetrical T wave inversions, a prominent U wave and a prolonged corrected QT interval (QT_c 560 ms). Echocardiogram confirmed concentric left ventricular hypertrophy but there was no regional wall motion abnormality, serum potassium was low (2.5 mEq/l) and cardiac biomarkers were normal. Considering accelerated hypertension he was treated with oral amlodipine and intravenous nitroglycerine. Before resorting to ACS treatment, in view of headache, vomiting and significantly prolonged corrected QT interval along with deep T wave inversions, an intracranial bleed was considered. Subsequently, this was confirmed by a CT of the brain, which showed a haemorrhage involving the left temporo-parietal region (figure 2). Interestingly, there was no focal neurological deficit till 6 h after presentation. After treating the patient with intravenous mannitol the T inversions normalised and the corrected QT also improved to 496 ms (figure 3).

Deep T wave inversions although commonly because of ischaemia and left ventricular hypertrophy(LVH), a neurogenic T wave has to be suspected when the QT_c is significantly prolonged.[1] Although neurogenic T wave inversions are deep and symmetrical, it may be asymmetrical as in this case when associated with LVH. Failures to recognise a neurogenic T inversion could be disastrous if anticoagulation were started inadvertently suspecting an ACS.

Figure 2 Plain CT image of brain showing a left temporo parietal haemorrhage.

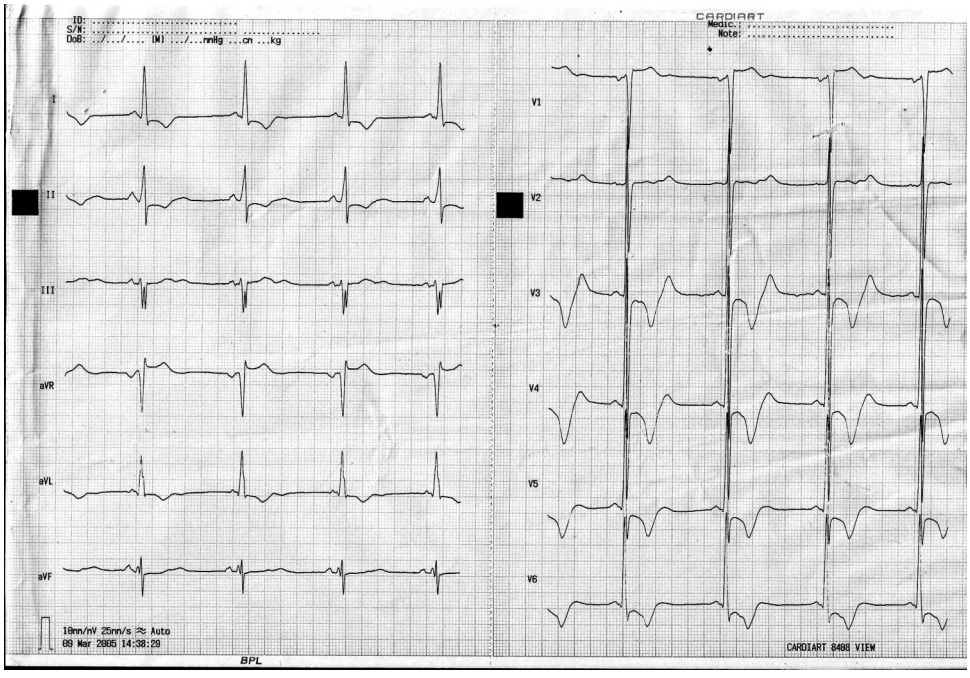

Figure 1 ECG in sinus rhythm with deep T wave inversions, prominent U wave in mid precordial leads and prolonged corrected QT interval of 580 ms.

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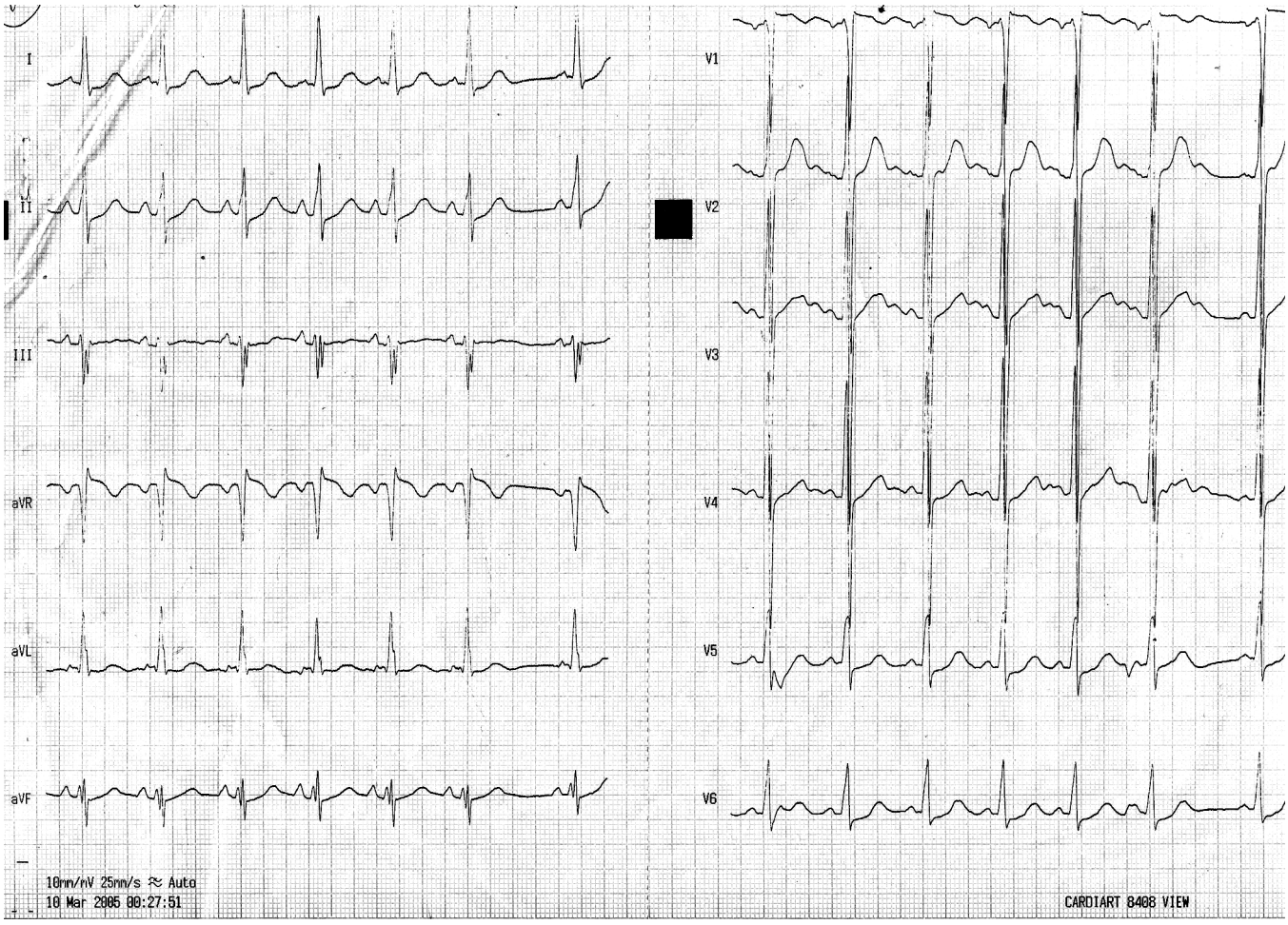

Figure 3 ECG after 12 h showing normalisation of T wave inversions and improvement in QT_c (496 ms).

Learning points

- Not all T wave inversions are ischaemic.
- Symmetric T wave inversions with prolonged QT_c though seen in ischaemia; a cerebral cause has to be ruled out according to the clinical profile.
- Cerebral T inversion can be asymmetric when there is associated left ventricular hypertrophy as in our case.

Competing interests None.

Patient consent Obtained.

Provenance and peer review Not commissioned, externally peer reviewed.

REFERENCE

1 Oppenheimer S. Neurothanatology-clinical significance of cerebrally induced cardiac changes. *Postgrad Med J* 1990;66:591–4.