

# Not all T wave inversions are ischaemic

Ravindran Rajendran,<sup>1</sup> Jigar S Patel,<sup>1,2</sup> Vivek Singla,<sup>3</sup> A C Nagamani<sup>1</sup>

<sup>1</sup>Department of Cardiology, Sri Jayadeva Institute of Cardiovascular Sciences and Research, Bangalore, Karnataka, India

<sup>2</sup>Department of Medicine, Baroda Medical College, Baroda, Gujarat, India

<sup>3</sup>Sri Jayadeva Institute of Cardiovascular Sciences, Bangalore, Karnataka, India

**Correspondence to**  
Dr Ravindran R,  
rravi\_dr@rediffmail.com

## DESCRIPTION

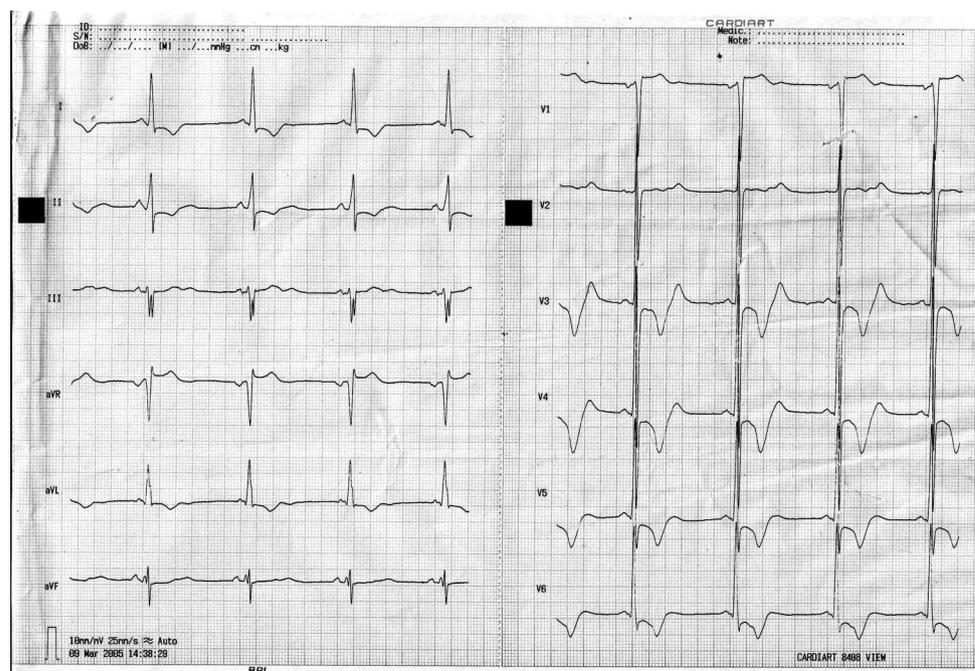
A 52-year-old man was referred as a case of acute coronary syndrome (ACS) for he had chest pain, vomiting and deep T wave inversions on ECG. Physical examination was normal except for blood pressure of 190/100 mm Hg. ECG (figure 1) satisfied voltage criteria for left ventricular hypertrophy along with deep asymmetrical T wave inversions, a prominent U wave and a prolonged corrected QT interval (QT<sub>c</sub> 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



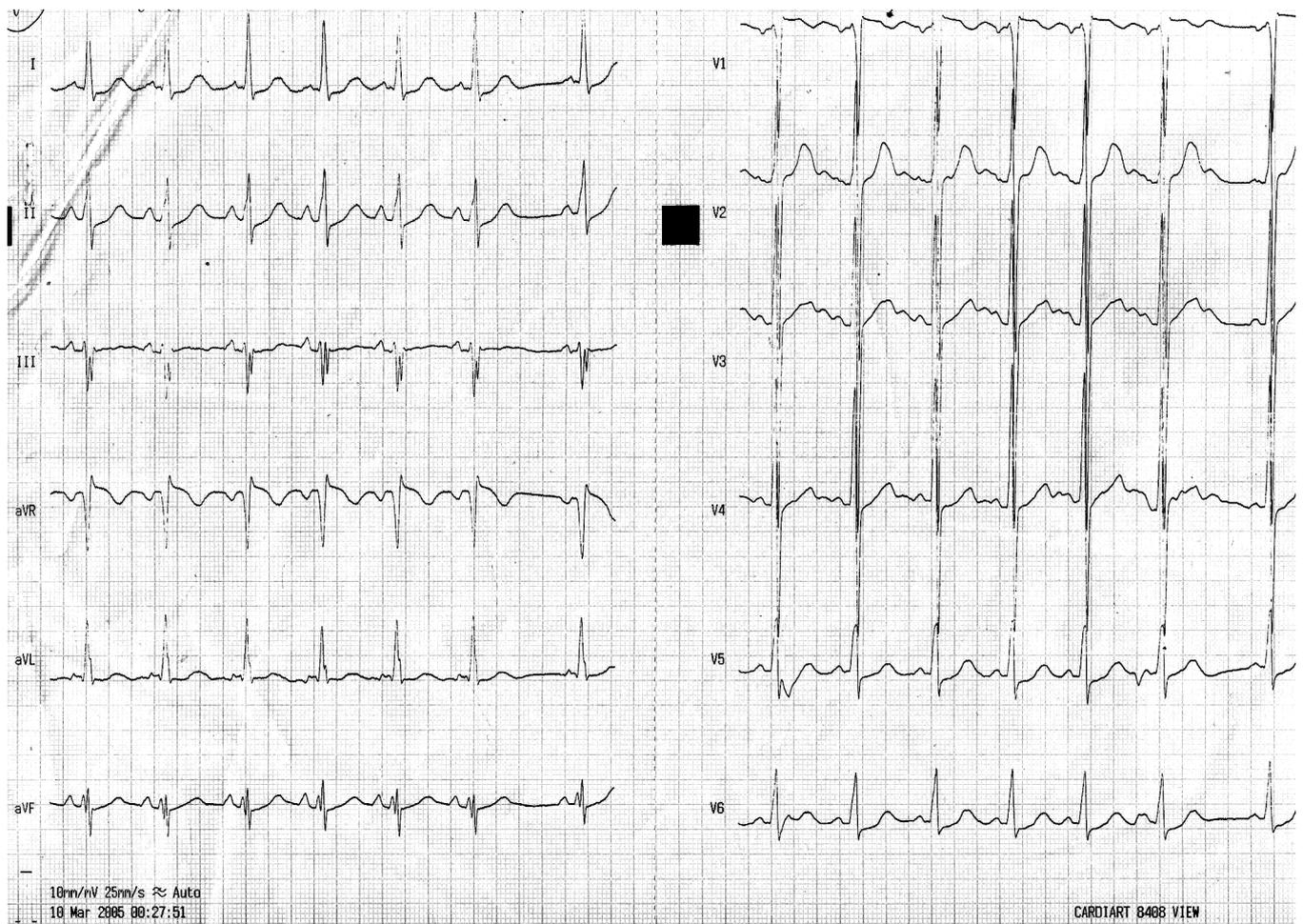
**Figure 2** Plain CT image of brain showing a left temporo-parietal haemorrhage.

suspected when the QT<sub>c</sub> is significantly prolonged.<sup>1</sup> 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 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.

**To cite:** Rajendran R, Patel JS, Singla V, et al. *BMJ Case Reports* Published online: [please include Day Month Year] doi:10.1136/bcr-2012-008219



**Figure 3** ECG after 12 h showing normalisation of T wave inversions and improvement in QT<sub>c</sub> (496 ms).

### Learning points

- ▶ Not all T wave inversions are ischaemic.
- ▶ Symmetric T wave inversions with prolonged QT<sub>c</sub> 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. Neuroanatomy-clinical significance of cerebrally induced cardiac changes. *Postgrad Med J* 1990;66:591–4.

Copyright 2013 BMJ Publishing Group. All rights reserved. For permission to reuse any of this content visit <http://group.bmj.com/group/rights-licensing/permissions>.  
BMJ Case Report Fellows may re-use this article for personal use and teaching without any further permission.

Become a Fellow of BMJ Case Reports today and you can:

- ▶ Submit as many cases as you like
- ▶ Enjoy fast sympathetic peer review and rapid publication of accepted articles
- ▶ Access all the published articles
- ▶ Re-use any of the published material for personal use and teaching without further permission

For information on Institutional Fellowships contact [consortiasales@bmjgroup.com](mailto:consortiasales@bmjgroup.com)

Visit [casereports.bmj.com](http://casereports.bmj.com) for more articles like this and to become a Fellow