Critical coronary disease indicated by electrocardiographic features (Wellens syndrome)

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Introduction

Interpreting electrocardiograms and deciding if a patient may require urgent percutaneous coronary intervention is a common task faced by hospital doctors of all grades, especially in the emergency department. The recognition of ST segment elevation myocardial infarction and new left bundle–branch block on electrocardiograms as patterns requiring urgent intervention is a skill mastered by many, but some less dramatic changes could be easily missed.

Case report

A 52-year-old South Asian man was admitted with sudden onset chest pain at rest. He denied any previous episodes of chest pain and reported good exercise tolerance. The pain was described as central and radiating to the back with some associated diaphoresis, with no radiation to the neck, shoulders or arms, and no nausea or vomiting. Its severity was rated as eight out of ten. He had a past medical history of ankylosing spondylitis and hypercholesterolaemia, and was an ex-smoker. He drank minimal alcohol and there was no relevant family history of note. He appeared comfortable from the end of the bed, although on direct questioning by the acute medical take senior house officer, he reported ongoing chest discomfort despite having been given morphine sulphate 10 mg.

He was haemodynamically stable with a blood pressure of 140/82 mmHg, respiratory rate 24 per minute, pulse 80 beats per minute, regular sinus rhythm on monitor and oxygen saturation of 96% on room air. His electrocardiogram showed a T wave inversion in V2 and a biphasic T wave in V3 (Figure 1).

He was loaded with dual antiplatelets (ticagrelor 180 mg and aspirin 300 mg) and fondaparinux. An intravenous infusion of glyceryl trinitrate was started. He was immediately discussed with the local tertiary centre and accepted for primary percutaneous coronary intervention.

The patient underwent a coronary angiogram which showed a critical stenosis of the proximal left anterior descending artery, which was successfully treated with a stent (Figure 2). The patient was clinically well after the intervention and was discharged from hospital following an uneventful recovery.

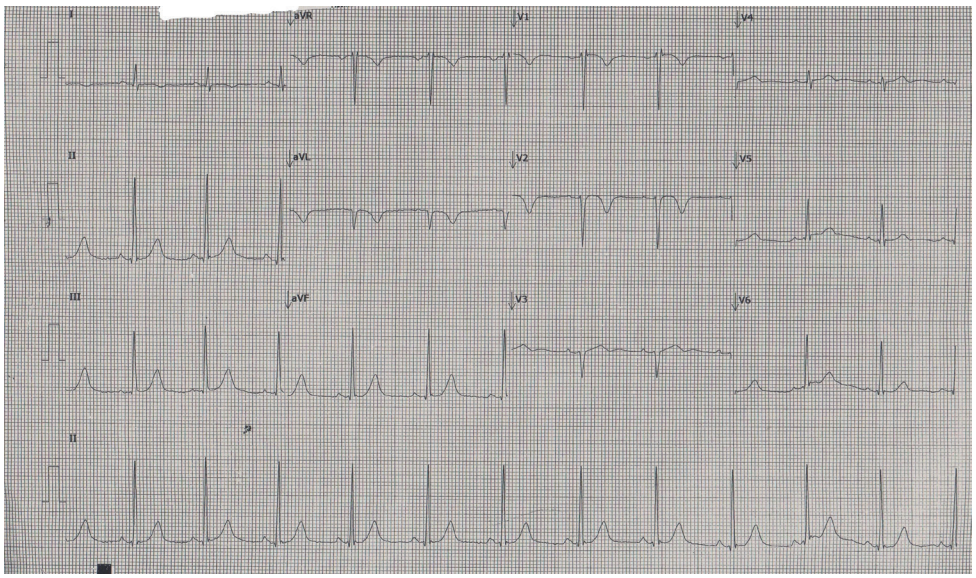

Figure 1. Electrocardiogram showing T wave inversion in V2 and biphasic T wave in V3.

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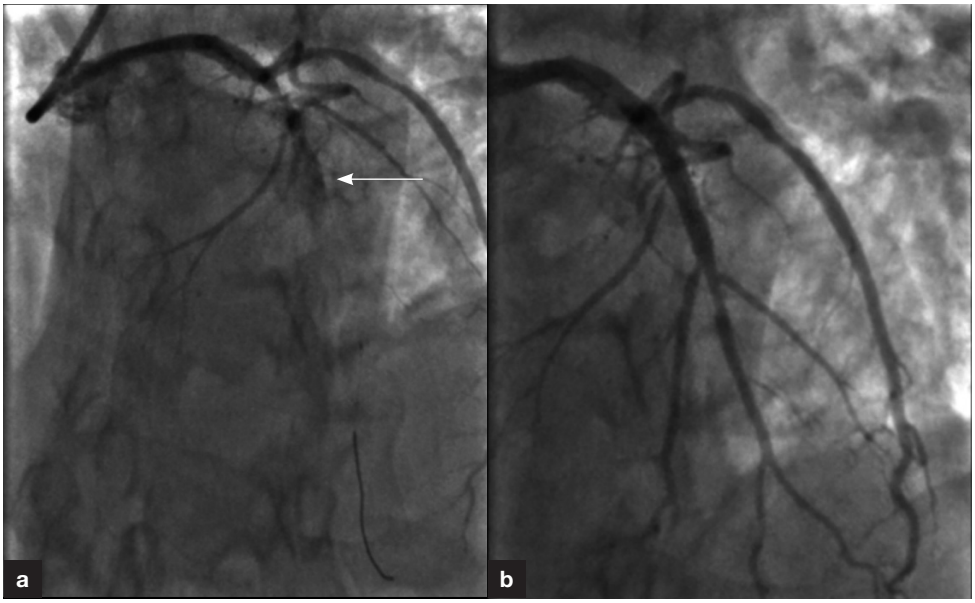

Figure 2. a. Initial coronary angiogram showing occlusion of left anterior descending artery (white arrow). b. Coronary angiogram following deployment of stent, showing reperfusion of left anterior descending artery.

Figure 3. Xanthelasma palpebrum, especially around the right eye.

Discussion

Deeply inverted or biphasic T waves in V2-3 with isoelectric or minimally elevated ST segment, a pattern known as Wellens syndrome, is highly specific for a critical stenosis of the proximal left anterior descending artery (de Zwaan et al, 1982). It can lead to grave consequences if it is not recognised in the emergency room.

While the patient presented with no history of coronary artery disease or angina, he had several significant risk factors. On examination he was observed to have xanthelasma palpebrum (Figure 3) and was an ex-smoker of 35–40 pack years despite his young age. Ankylosing spondylitis, a chronic inflammatory condition, is also known to be associated with coronary artery disease (Ungprasert et al, 2015).

This case highlights the importance of recognition of Wellens syndrome as an electrocardiographic pattern suggestive of a critical intracoronary lesion requiring urgent invasive intervention.

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Learning points

- Vigilance is required to recognise electrocardiographic changes that require emergent coronary reperfusion beyond the well-known ST elevation and new left bundle–branch block.
- Wellens syndrome, which is characterised by inverted or biphasic T waves with initial positive deflection and terminal negativity, is an abnormal electrocardiographic pattern suggestive of a significant intracoronary lesion.
- Other such electrocardiographic changes include De Winter's T wave and posterior ST elevation, which shows ST depression rather than ST elevation on a conventional 12-lead electrocardiogram.

References

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