CASE REPORT

Acute coronary syndrome

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Accepted 23 May 2014

SUMMARY

The paramedics brought a 60-year-old man to the emergency department after a sudden onset of shortness of breath with a subsequent drop in the Glasgow Coma Scale (GCS). On arrival the patient looked peri-arrest. His O₂ saturations were 84% on 15 L of oxygen. He had gasping breathing with a completely silent chest and the GCS was 6/15 (E=1, V=1, M=4). The blood gas revealed type-2 respiratory failure. The chest X-ray was unremarkable and ECG was not indicative for cardiac catheterisation lab activation. Bedside shock scan was done which showed global hypokinesia of the left ventricle. In spite of unconvincing ECG and chest X-ray, an acute cardiac event was diagnosed in view of an abnormal bedside echo. The patient was transferred to the cardiac catheterisation lab for urgent percutaneous coronary intervention which revealed critical stenosis of the left main stem coronary artery, which was successfully stented. The patient had a good recovery from the life-threatening event.

BACKGROUND

Patients with undifferentiated shock can be a real challenge for the Emergency Physician. To diagnose the underlying cause in a shocked patient in a timely manner is vital as the treatment options may be completely different and are also time critical. It is imperative for emergency physicians to equip themselves with ultrasound skills as it can play a key role in the patient's management.

This case is an excellent example of the importance of bedside ultrasound scan utilisation. The patient's presentation was very atypical for an acute coronary event. His bedside ECG ([figure 1](#)) and chest X-ray (CXR; [figure 2](#)) were not helpful in the diagnosis until an ultrasound scan ([video 1](#)) revealed a significant left ventricle wall motion abnormality and explained the patient's condition.

CASE PRESENTATION

Our patient was a 60-year-old man who was brought to the emergency department (ED) by paramedics after a sudden onset of shortness of breath.

On scene when attended by the paramedics the patient was in significant respiratory distress and was diaphoretic. There was no history of chest pain. On arrival to the ED, he was unresponsive but the airway was patent. The patient's breathing effort was very poor and he was gasping. His trachea was central and chest was completely silent. His breathing was supported initially with a bag valve mask and then subsequently the patient was intubated in view of his low Glasgow Coma Scale (GCS). He was easy to ventilate and the chest

movements were bilateral and equal. His first blood pressure reading was 170/110 mm Hg and pulse rate was about 120/min. His neck veins were not engorged and he had equal blood pressure in both arms. His GCS was 6/15 (E=1, V=1, M=4). The rest of the examination was unremarkable. We could not figure out the cause of the patient's acute deterioration after completing the primary survey.

The patient was continuously monitored and serial ECGs were carried out. The ECGs were discussed with the Cardiology Registrar who was not convinced of any acute cardiac event.

The patient had no significant medical or surgical history and was not on any medications.

INVESTIGATIONS

Routine bloods in the ED were:

- ▶ Haemoglobin 158 g/L
- ▶ White cell count $17.1 \times 10^9/L$
- ▶ Sodium 136 mmol/L
- ▶ Potassium 4 mmol/L
- ▶ Urea 6.1 mmol/L
- ▶ Creatinine 97 $\mu\text{mol/L}$
- ▶ Estimated glomerular filtration rate 73 mL/min/ $L.73 \text{ m}^2$
- ▶ C reactive protein <5 mg/L
- ▶ Troponin I 115 $\mu\text{g/L}$
- ▶ International normalised ratio 1.0
- ▶ D-dimer 0.95 $\mu\text{g/L}$
- ▶ Arterial blood gas: pH 7.38, pCO₂ 4.5 kPa, pO₂ 12.7 kPa, HCO₃ 27.8 mmol/L, base excess -7.5, lactate 2.7.

CXR showed no significant pathology.

ECG showed sinus tachycardia with left ventricular hypertrophy.

Focused bedside cardiac ultrasound scan¹ and shock scan² conducted by the ED Registrar showed global hypokinesia of the left ventricle.

Official echo performed later by the cardiologist showed severe systolic dysfunction and apical thrombus.

The coronary angiogram revealed severe ostial stenosis of the left main coronary artery.

DIFFERENTIAL DIAGNOSIS

A patient with low GCS, shortness of breath and type-2 respiratory failure may have wide differentials like life-threatening asthma, tension pneumothorax, acute cardiac events or massive pulmonary embolism. Treatment of each is quite different and time critical. An early shock scan using ultrasound helped us narrow our differential towards a cardiac pathology.

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To cite: Jawaid S, Chaudary A. *BMJ Case Rep* Published online: [please include Day Month Year] doi:10.1136/bcr-2014-203828

Figure 1 ECG showing sinus tachycardia with QRS at upper normal limit of 120 ms. The voltage criteria for left ventricular hypertrophy is met. No features to suggest acute ST-elevation myocardial infarction are obvious.

TREATMENT

On the way to hospital, paramedics had given the patient salbutamol and ipratropium nebulisation, intravenous hydrocortisone (100 mg) and intravenous furosemide (40 mg).

In the ED, initially the patient's breathing was supported with bag-valve-mask ventilation with 15 L of O₂. The patient was also given intravenous salbutamol 0.5 mg bolus, magnesium sulfate 2 g and 500 mL of 0.9% normal saline.

ITU were consulted to secure the airway. The patient was intubated and transferred to the cardiac catheterisation laboratory for immediate percutaneous coronary intervention (PCI).

OUTCOME AND FOLLOW-UP

A 4.5×13 mm stent was placed in the left main artery during emergency PCI. Postprocedure, the patient was admitted to the intensive care unit for 1 day and then transferred to the ward for monitoring. After a few days of observation the patient was discharged home with medicines and for follow-up in the cardiology clinic.

DISCUSSION

We found the patient's presentation very challenging. The patient had no chest pain and had low GCS. His CXR and ECG

Figure 2 Chest anteroposterior supine X-ray not showing any major areas of airspace opacification or pneumothorax.

Video 1 A sub-xiphoid view of heart during bedside ultrasound shock scan shows almost globally akinetic left ventricle. Right ventricle seems to be contracting normally. No pericardial fluid was seen.

were non-diagnostic. Atypical presentations in acute coronary syndrome are known phenomenon where there is absence of chest pain. Although some high-risk factors have been identified,³ for example older age (72.9 years), female gender, non-white race and comorbidities (diabetes, stroke and heart failure); our patient had none of them. The National Registry of Myocardial Infarction 2 database showed that 33% patients did not present with chest pain.⁴ Patients with myocardial infarction without chest pain are less quickly diagnosed and treated and have higher adjusted odds of hospital mortality, regardless of whether they have an ST-segment elevation.^{5 6} The presence of silent chest is a possible presentation in early stages of cardiogenic shock and has mortality of about 70% due to the difficulty in diagnosis.⁷ Although our patient was presented atypically with very little history available as a result of low GCS and non-specific ECG, a quick bedside (see [video 1](#)) echo which showed a globally hypokinetic left ventricle proved to be a life saver as the right diagnosis was made and critical minutes were saved by not making other unnecessary investigations such as CT of the head.

Learning points

- ▶ Ultrasound is an important tool for emergency and acute care physicians.
- ▶ Bedside ultrasound should be performed early during the initial assessment of sick medical patients to diagnose life-threatening emergencies.
- ▶ Acute coronary syndrome (ACS) with flash pulmonary oedema can mimic life-threatening asthma and respiratory failure.
- ▶ Atypical presentations of ACS should always be kept in mind.

Bedside ultrasound is widely used by most physicians during the management of trauma patients but its use in the assessment of sick medical patients is still not considered an important diagnostic tool. There is enough evidence⁸ to suggest that the use of ultrasound during the initial assessment of sick medical patients can increase the diagnostic accuracy significantly as shown in this case.

Contributors Both the authors have dealt with the patient and contributed to the case report.

Competing interests None.

Patient consent Obtained.

Provenance and peer review Not commissioned; externally peer reviewed.

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