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CASE REPORT

See Beyond The Seen: Ischemic Cardiomyopathy with Diagnostic Dilemma

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ABSTRAK

Kardiomiopati boleh mempunyai etiologi yang berbeza. Pesakit mungkin akan datang dengan simptom-simptom kegagalan jantung akut ataupun sakit dada iskemik, bergantung kepada etiologi kardiomiopati tersebut. Pegawai perubatan yang merawat mempunyai tanggungjawab untuk mencari punca tersebut kerana rawatan segera mungkin akan mengubah prognosis pesakit; pada masa yang sama sedar akan kemungkinan diagnosis yang lain selain daripada yang jelas. Dalam kes ini, kami membentangkan seorang wanita yang datang dengan sesak nafas dan tiada sakit dada. Beliau menunjukkan kadar denyutan jantung dan kadar pernafasan yang laju semasa ketibaan dan elektrokardiogram (ECG) beliau menunjukkan perubahan iskemia di lead inferior dan lateral. Ekokardiogram di sisi katil menunjukkan ventrikel kiri terdilat. Biomarker jantung beliau meningkat, dan ini menyebabkan kejadian iskemia tidak dapat dikecualikan. Beliau akhirnya meninggal dunia. Objektif laporan kes ini adalah untuk menekankan pentingnya mempunyai minda terbuka mengenai diagnosis berbanding yang ada dengan mengetahui bahawa peyakit-penyakit ini mungkin mempunyai ciri-ciri yang sama.

Kata kunci: iskemia, kardiomiopati, kegagalan jantung

ABSTRACT

Cardiomyopathy can have different aetiologies. Patient may present with typical symptoms of acute heart failure or ischemic chest pain, depending on the underlying aetiologies. It is the responsibility of the treating physician to find out the cause as prompt treatment could possibly alter the prognosis of the patient, but at the same time bearing in mind other possible diagnosis apart from the one which is obvious. In this case, we present a lady who came with breathlessness and no chest pain. She was tachycardic and tachypnoeic upon arrival and her

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electrocardiogram (ECG) showed ischemic changes in the inferior and lateral leads. Bedside echocardiogram showed dilated left ventricle. Her cardiac biomarker was raised, making an ischemic event unlikely to be excluded. She eventually succumb to her illness. The objective of this case report was to highlight the importance of keeping an open mind about the differential diagnoses available, knowing that the conditions could have overlap features.

Keywords: cardiomyopathy, heart failure, ischemia

INTRODUCTION

Cardiomyopathy is a disease of the heart muscle that impairs its contractility, having many causes. Dilated left ventricle, in particular could be caused by of dilated or takotsubo cardiomyopathy. The elevation of cardiac markers may point to an ischemic cause, with ischemic cardiomyopathy patients also presenting with dilated ventricle as a complication from previous insults. Dilated or takotsubo cardiomyopathy has their own demographic prevalence (Luk et al. 2009; Templin et al. 2015) and to differentiate these two from ischemic cardiomyopathy would require an angiographic evidence (Felker et al. 2002). This patient presented with signs and symptoms of heart failure, but with a dilated left ventricle at the bedside ultrasound. Concurrently, there was also an elevation in cardiac markers, making an ischemic origin not excludable. The overlapping clinical features possess a challenge in making an accurate diagnosis. The patient was eventually sent for angiogram which revealed a significantly blocked vessel and subsequently collapsed on table during the procedure.

CASE REPORT

Madam A, a 71-year-old lady with background history of diabetes mellitus and hypertension, presented to us with sudden onset of breathlessness while she was walking to the toilet. There was no chest pain, diaphoresis, palpitation or fever. She had a cough for the past week and visited a general practitioner where she was treated for gastro-esophageal reflux disease (GERD), with no antibiotics given. She claimed to be in compliance with all her medications.

Upon arrival, her temperature was 36.4˚C, blood pressure was 176/90 mmHg, heart rate was 140 beats/minute, respiratory rate of 36 breaths/minute, and saturation was 98% under room air. She was fully conscious and her Glasgow Coma Scale (GCS) was full. However, she was only able to speak few words due to breathlessness. Auscultation of her heart revealed no murmur and there was bibasal crepitations at both lung fields. Her random blood sugar was 33 mmol/L upon arrival. Serum ketone was 0.5 mmol/L.

A bedside ultrasound was performed to reveal a B profile over both lung

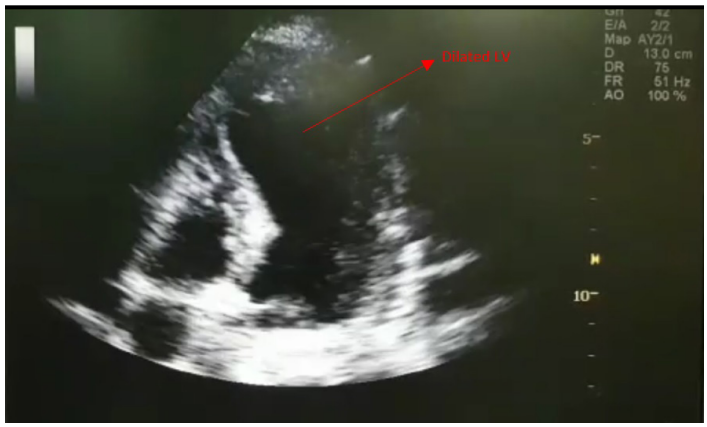

Figure 1: Bedside echocardiogram showed dilated left ventricle (LV) on a apical 4-chamber view.

fields. Her bedside echocardiography revealed a dilated left ventricle (Figure 1). Electrocardiogram (ECG)) was done, showing a ST segment elevations at lead II, III, avF, V3 to V6 as shown in Figure 2.

After reviewing her ECG, she was treated for acute myocardial infarction with heart failure and the cardiology team was activated. She was planned for pharmacological thrombolysis with tenecteplase while being loaded with aspirin 300 mg and clopidogrel 300 mg stat. In view that she was tachypnoeic, non-invasive ventilation with continuous positive airway pressure mode was started with the anaesthesia team's involvement.

After the case was discussed with the consultant cardiologist, it was decided that she needed an urgent angiogram and percutaneous coronary intervention (PCI). She was electively intubated while waiting to be called to the operation theatre. Her troponin I level came back at 551.3 pg/mL. She

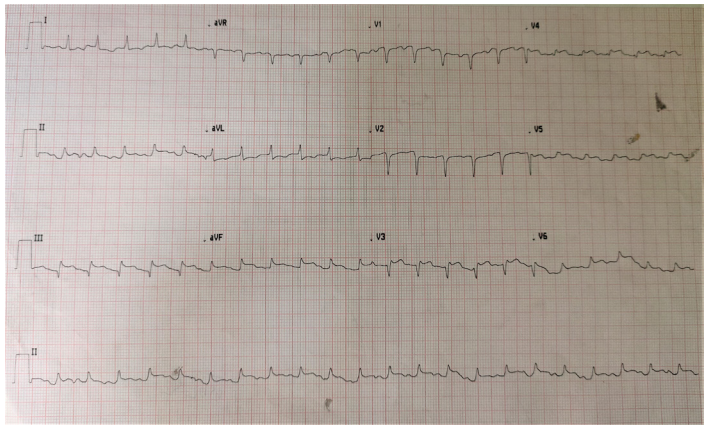

Figure 2: ECG upon arrival. It showed an ST segment elevation at lead II, III, avF, V3 to V6.

was also having hyponatremia with sodium levels of 120 mmol/L. The other electrolytes and her liver function test returned normal.

After intubation, she started experiencing hypotension which needed inotropic support. She was only pushed to the operation theatre 4 hours after presentation to Emergency Department as the theatre was not immediately available at that time. During the procedure, it was noted that there was 80% stenosis of the ostial to proximal left anterior descending (LAD) artery. While the angioplasty to LAD was ongoing, patient developed pulseless electrical activity (PEA). Cardiopulmonary resuscitation (CPR) was commenced for 40 minutes to no avail. Resuscitation effort was terminated and death was pronounced by the primary team.

DISCUSSION

There are many causes of cardiomyopathy with dilated left ventricles, including dilated cardiomyopathy, which in turns has multiple aetiologies, ischemic cardiomyopathy and takotsubo cardiomyopathy. Although dilated cardiomyopaty may occur at any age, it is most common among males between the ages of 20 to 50 (Luk et al. 2009); making the approach to diagnosis quite difficult at times. The causes can be genetic (inheritance or mutations), or environmental, such as viral infections (Luk et al. 2009). The criteria to be fulfilled for a dilated cardiomyopathy diagnosis includes the absence of systemic hypertension and coronary artery disease (Luk et al. 2009). The patient discussed in this case had both hypertension and coronary artery disease as proven by angiogram finding, hence the diagnosis was unlikely to be dilated cardiomyopathy.

Takotsubo cardiomyopathy on the other hand, is found to be more prevalent among female with a ratio of 9:1 (Templin et al. 2015), surprisingly more common among men in Japan for unclear reason. It is described as an acute heart failure syndrome precipitated by physical and emotional stress, with the former predominating. Of note, there was also a case reported to be caused by adrenaline infusion (Azouzi et al. 2019). Acute, former, or chronic neurological and psychiatric disorder was reported to be present in more than half of the patients (Templin et al. 2015). Our patient fits into the demographic background of takotsubo cardiomyopathy, despite there being no physical or emotional stress reported.

It remains a challenge to differentiate between takotsubo cardiomyopathy and acute coronary syndrome. This is because more than 80% of the patient diagnosed with takotsubo cardiomyopathy has also been reported to have elevated cardiac troponin level and had signs of myocardial ischemia at the initial ECG (Templin et al. 2015). The patient presented in this case also has the same presentation where troponin I upon presentation was 551.3 pg/mL with the ECG showing ST elevation in the anterior and inferior leads. Hence, it is important to do an early coronary angiography to rule out

acute coronary syndrome (Pelliccia et al. 2017). Bear in mind that presence of coronary artery diseases is not an exclusion criteria for diagnosis of takotsubo cardiomyopathy as 15% of takotsubo cardiomyopathy patients also had angiographic evidence of coronary artery disease (Pelliccia et al. 2017; Templin et al. 2015).

With regards to dilated and ischemic cardiomyopathy, there are certain distinguishing features. In the former, there is an absence of coronary artery disease, in contrast to the latter, which would have at least 75% stenosis in the left main stem, proximal left anterior descending artery or 2 or more epicardial coronary arteries on invasive or computed tomography coronary angiography (Japp et al. 2016). There is also a study which proposed to define ischemic cardiomyopathy as those with history of myocardial infarction or revascularization (either coronary artery bypass graft or PCI), those with left main stem or proximal left anterior descending at least 75% stenosed, or those with at least 75% stenosis of two or more epicardial vessels (Felker et al. 2002). However, a correct definition has yet to be established (Lima et al. 2017) with many authors taking this condition as a spectrum of stunned to hibernating myocardium and repetitive episodes of ischemia (Lima et al. 2017). The method to differentiate the two is by angiogram to visualize the vessel blockage.

The patient presented in this case did not come with chest pain but acute heart failure symptoms. Bedside echocardiography noted dilated ventricles which could either point to dilated or takotsubo cardiomyopathy. Biochemically, cardiac marker was raised and her ECG did show ischemic changes. It causes a diagnostic dilemma in this patient as the possibility of all dilated, takotsubo and ischemic cardiomyopathy were there. Hence, there is a role for the early involvement of the cardiology team in co-managing this type of patients in the Emergency Department as an early angiogram can be planned and if vessels blockage were to be found, with immediate intervention that could have been done to save the myocardium.

CONCLUSION

As a conclusion, when a patient presented with acute heart failure symptoms, the treating physician needs to keep in mind the possible causes, as what is seen during bedside echocardiogram and ECG, might not necessarily point towards the most obvious diagnosis. Instead, it could be the complication of what had happened earlier.

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