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CASE REPORT

Dilated cardiomyopathy in the emergency department- from rhythm to regurgitation: A case report

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Abstract

Dilated cardiomyopathy (DCM) is a non-ischemic myocardial disease marked by structural and functional abnormalities, accounting for the third most common cause of heart failure and the leading indication for heart transplantation globally. Common presenting symptoms include lower limb edema, orthopnea, and paroxysmal nocturnal dyspnea. Patients presenting to the emergency department with unexplained or advanced heart failure symptoms should undergo immediate electrocardiogram (ECG) and bedside echocardiography to aid diagnosis. This case highlights the clinical relevance of early echocardiographic assessment in the emergency setting and its role in recognizing DCM with uncommon features, such as abnormal skin pigmentation that may indicate a genetic etiology.

Keywords: Dilated cardiomyopathy, Echocardiography, Electrocardiogram, Emergency Diagnosis, Heart failure

INTRODUCTION

Dilated cardiomyopathy (DCM) is a progressive disease of the heart muscle that is characterized by ventricular chamber enlargement and contractile dysfunction.[1] Most patients present between the ages of 20 and 60 years of age, but dilated cardiomyopathy can occur in children and older adults.[2] Increased ventricular volume leads to eccentric hypertrophy in dilated cardiomyopathy. The most common cause of DCM is idiopathic, familial, post-myocarditis, tachycardia, dysthyroidism, hypertension, alcohol, chemotherapy, auto-immune disease, or peripartum.[3] The most common presentations of heart failure are shortness of breath, orthopnea, paroxysmal nocturnal dyspnea, and peripheral edema.[4] So, we report a case of a 64-year-old female with a history of bilateral lower limb swelling for 2 years and blackish discoloration of the face for 6 months. This case highlights the diagnostic value of early bedside electrocardiogram and echocardiography in the emergency department, demonstrating how prompt imaging can aid in the timely diagnosis of dilated cardiomyopathy in an acute care setting.

CASE REPORT

A 64-year-old female farmer was referred from a municipal hospital to a tertiary care center for further evaluation. She presented with a history of bilateral lower limb swelling for 2 years and shortness of breath for five days. Her dyspnea was acute in onset (MMRC grade III–IV), accompanied by orthopnea (requiring two pillows) and paroxysmal nocturnal dyspnea. She reported difficulty in breathing while lying flat, often waking at night due to breathlessness. Over the past month, her leg swelling had worsened from grade II to grade III pitting edema. Additionally, she noted gradual development of blackish discoloration on her face over the last six months.

She was a known case of hypothyroidism, recently started on thyroxine 25 mcg daily for the past three months. Her past history included smoking (10 pack-years) and alcohol consumption, both discontinued five years ago. There was no history of fever, cough, facial puffiness, reduced urine output, chest pain, palpitations, loss of consciousness, prolonged immobilization, or intravenous drug use. She had no history of hypertension, diabetes, pulmonary tuberculosis, or similar illness in her family.

She had visited the nearby hospital, and she was referred to a tertiary hospital for further evaluation. At our center, a clinical examination was done, and relevant investigations were sent.

Her pulse was 101 beats per minute, regular in rhythm, with no radio-radial or radio-femoral delay. All peripheral pulses were palpable. Her respiratory rate was 20 breaths per minute. Oxygen saturation was 85% on room air, which improved with supplemental oxygen at 2 liters per minute via nasal prongs. Blood pressure was 110/80 mmHg, and her body temperature was 98.2°F.

On general physical examination, she had bilateral pedal edema of the lower limbs (Grade III) (Figure 1). There was no pallor, icterus, cyanosis, clubbing, or dehydration.

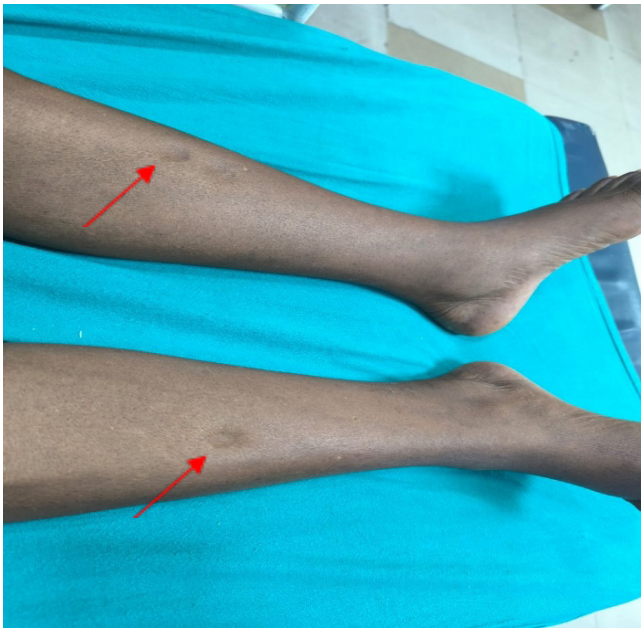

Figure 1. Grade III Bilateral Pitting Edema (Red Arrow)

Systemic examination showed bilateral crepitus on chest auscultation and normal heart sounds on cardiac auscultation.

ECG showed the features of low voltage, i.e., less than 5mm in limb leads and less than 10mm in chest leads, and a dominant R wave in V1, which is suggestive of right ventricular hypertrophy (Figures 2 & 3).

Bedside echocardiography showed dilated Right atrium and Right ventricle with severe tricuspid regurgitation, Left Ventricular Ejection Fraction (LVEF)- 35-40%. No regional wall motion abnormalities were noted (Figure 4).

Laboratory tests revealed a hemoglobin level of 11.6 g/dL, total white blood cell count of 6,700/cumm, and a platelet count of 160,000/cumm. Renal function was within normal limits, with urea at 40 mg/dL, creatinine at 0.9 mg/dL, sodium (Na^+) at 138 mmol/L, and potassium (K^+) at 4.6

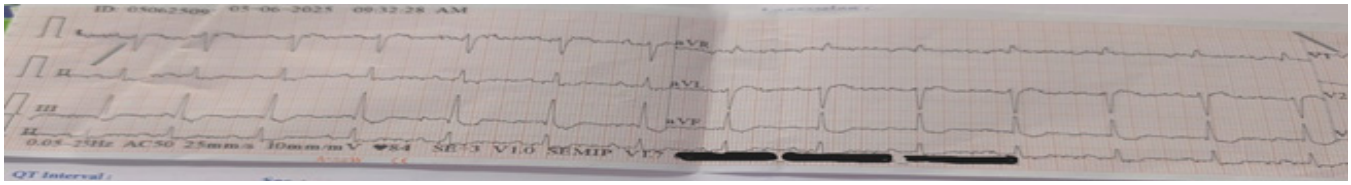

Figure 2. Electrocardiogram (Limb Leads) of the patient

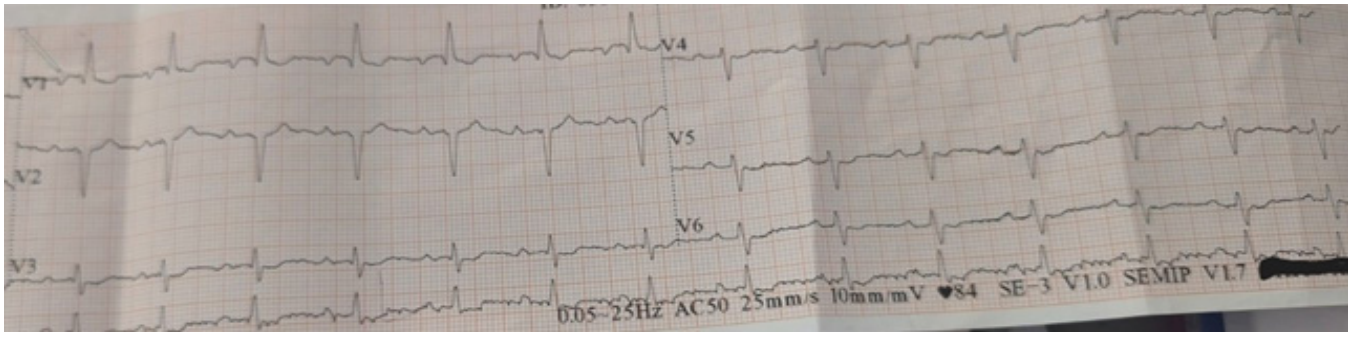

Figure 3. Electrocardiogram (Chest leads) showing a dominant 'R' wave in V1 and low voltage, i.e., less than 10mm in chest lead

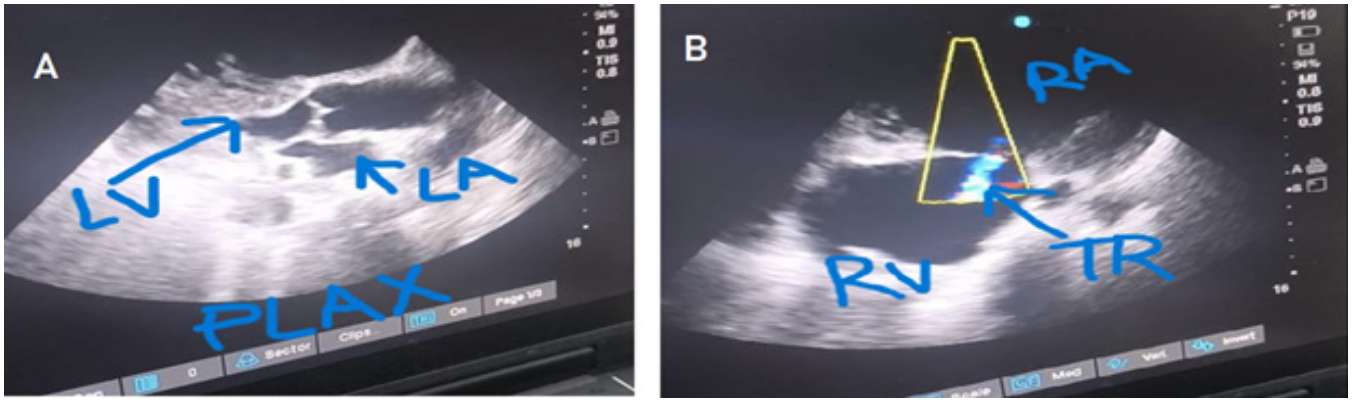

Figure 4. (A) Parasternal long Axis view (PLAX) showing left atrium (LA), left ventricle (LV) with mitral and aortic valve, (B) Four Chamber View showing dilated right atrium (RA, Green arrow), dilated right ventricle (RV, red arrow) with severe tricuspid regurgitation (TR, blue arrow)

Figure 5. Blackish Skin discoloration over the face

mmol/L. The thyroid function test (TFT) showed elevated thyroid-stimulating hormone (TSH) at 25.329 µIU/mL, with low free T3 (1.64 pg/mL) and free T4 (0.71 ng/dL), consistent with hypothyroidism.

She was managed with intravenous furosemide 20 mg. Her shortness of breath improved following diuretic therapy administered in the emergency department.

She was diagnosed as a case of heart failure with reduced ejection fraction (New York Heart Association (NYHA) - III) secondary to dilated cardiomyopathy. Following stabilization in the emergency department, she was admitted to the Coronary Care Unit (CCU) for further management. Intravenous diuretics were continued, and a cardiologist performed an echocardiogram, which confirmed the findings observed during bedside assessment in the emergency department. Her clinical condition improved, and after 4 days of hospital stay, she was successfully discharged on a combination of oral furosemide and spironolactone (20/50 half tablets once a day), metoprolol succinate 12.5mg once a day.

DISCUSSION

This was a case of a 66-year-old female, referred from another hospital for further management. Dilated cardiomyopathy is the third most common cause of heart failure and the most frequent reason for heart transplantation.[1] The provisional diagnosis of our case was Heart failure with reduced ejection fraction (LVEF: 35%) secondary to dilated cardiomyopathy. In our case, the cause of dilated cardiomyopathy is either idiopathic, alcohol induced, or hypothyroidism. Merlo M described a similar etiology in their study.[3] However, the relatives and the patient herself noticed abnormal skin discoloration for six months. Abnormal skin discoloration is one of the diagnostic red flags for genetic forms of dilated cardiomyopathy. Other red flags include skeletal myopathy and neurosensory disorders (e.g., deafness, blindness).[5]

The timely use of electrocardiography and bedside

echocardiography in the emergency department was critical in establishing this diagnosis. While ECG and Echocardiography are non-specific, they can provide clues for diagnosis.[6] In this case, the ECG revealed low-voltage QRS complexes and a dominant R wave in lead V1, suggestive of right ventricular hypertrophy. These findings were confirmed on echocardiography, which showed a dilated right atrium and right ventricle with severe tricuspid regurgitation, without thrombus in the pulmonary artery. This case highlights the diagnostic value of comprehensive clinical assessment, coupled with focused use of ECG and echocardiography, in identifying DCM at initial presentation—even when typical features are absent. It reinforces the importance of integrating subtle clinical signs and bedside imaging to guide management in emergency cardiac care

CONCLUSION

Dilated cardiomyopathy is the common presentation in the emergency department. The most common cause of dilated cardiomyopathy is idiopathic. It is less commonly diagnosed in the emergency department. A careful clinical history and examination, electrocardiogram, and echocardiography will help in the diagnosis of dilated cardiomyopathy, which is the fourth leading cause of heart transplantation.

DECLARATIONS

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Conflict of Interest
None

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None

Ethical clearance
Not required for case report

Consent of the Study
Written consent was obtained from the patient for the publication of the case report.

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