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Case Report on Dilated Cardiomyopathy with Type-2 Diabetes

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Introduction and background

When the left ventricular ejection fraction (LVEF) falls below 40%, a condition known as dilated cardiomyopathy (DCM), which affects the heart muscle, is present. DCM is characterised by the expansion and dilatation of one or both ventricles as well as reduced contractility. By definition, people have systolic dysfunction, whether or not they also exhibit overt heart failure symptoms. Both primary and secondary DCM are possible classifications for this disease process. It is only possible to diagnose primary DCM after ruling out secondary causes because it is regarded as idiopathic.[1]

Cardiomyopathies are diseases of the heart muscle that affect mechanical and/or electrical function and cause dilated, hypertrophic, or restricted pathophysiology. Dilated cardiomyopathy (DCM) affects the structure and operation of the heart muscle and is a non-ischemic disorder. The clinical picture of DCM consists of left or biventricular dilatation and systolic dysfunction without coronary artery disease, hypertension, valve disease, or congenital heart disease[2].

In addition, arrhythmias (irregular heartbeats) and blood clots in the heart can result from dilated cardiomyopathy.

Patients with non-ischemic dilated cardiomyopathy who have type 2 diabetic mellitus (T2DM) are more likely to experience negative long-term consequences (NIDCM). Uncertainty persists regarding T2DM's additional impact on LV (left ventricle) function in NIDCM. In light of this, our goal was to find out how comorbid T2DM affects LV deformation in people with NIDCM[5].

Incidence - DCM is one of the most widespread causes of heart failure, with prevalence rates in the general population ranging from 1 in 250 to 1 in 2500. According to reports, there are 5-7 instances of DCM per 100,000 people per year[3]. About 10.2% of Americans have diabetes, and 9 to 22% of diabetic patients also have heart failure. In antidiabetic drug clinical trials, 4–30% of patients with diabetes had HF. On the other hand, 30 to 40% of HF patients recruited in HF trials had pre-diabetes or diabetes[4].

Case presentation

(Day 0)

A 51-year-old male presented to the emergency department on 2nd Feb 2023 at 10:30 pm with a 4-day history of breathlessness and b/l pedal oedema from the last 15 days associated with a slight blurring of vision bilateral eyes and having ulcers in the left foot in different stages of healing. One active ulcer is present on the right side of the tibia. He has been a known case of type-2 diabetes mellitus for the last 15 years and is on regular medication [Inj. Humalog mix (Inj. Lispro 25% + Inj. Lispro Protamine 75%)] s/c BD and Tab. Glimy 3mg p/o OD, Tab. Verifica M (50/500) p/o BD, Tab. Voglibose + Repaglinide (0.2/0.5) p/o TDS.

History of past illness:

He has a history of pulmonary tuberculosis diagnosed in March 2022 and had taken ATT for 9 months and stopped after consulting a doctor 6 months back. No history of hypertension, drug allergies or any other chronic major medical illness present H/o chest pain present 10 years back for that no ECG was done at that time. H/o one episode of haematuria present 18 months back.

He was a chronic alcoholic and chronic smoker for 10 years and quit drinking and smoking for the last 2 years.

On admission, the vital signs were:

BP- 150/84mmHg

Pulse rate- 88bpm

Respiration rate – 18bpm

SPO_2 – 92% on 4l of oxygen

Temp – 98.2°F

Observations & investigations at the time of admission

Neurological assessment:

GCS – $E_4V_5M_6$

B/L pupil normal reaction

Bilateral planters↓↓

Respiratory assessment-

Chest – B/L air entry +

A/E – L>R

Inspiratory diffuse coarse crepitus +

Expiratory wheeze +

Orthopnoea +

Abdomen-

Non-tender, Soft P/A

Outside 2D echo shows LVEF-25%, LA/LV -dilated, mild conc. LVH, Severe LV Systolic dysfunction, mild carotid effusion +, moderate Mitral Regurgitation, Mild Tricuspid Regurgitation, Moderate Pulmonary Arterial Hypertension.

ECG shows sinus tachycardia & right ventricular hypertrophy.

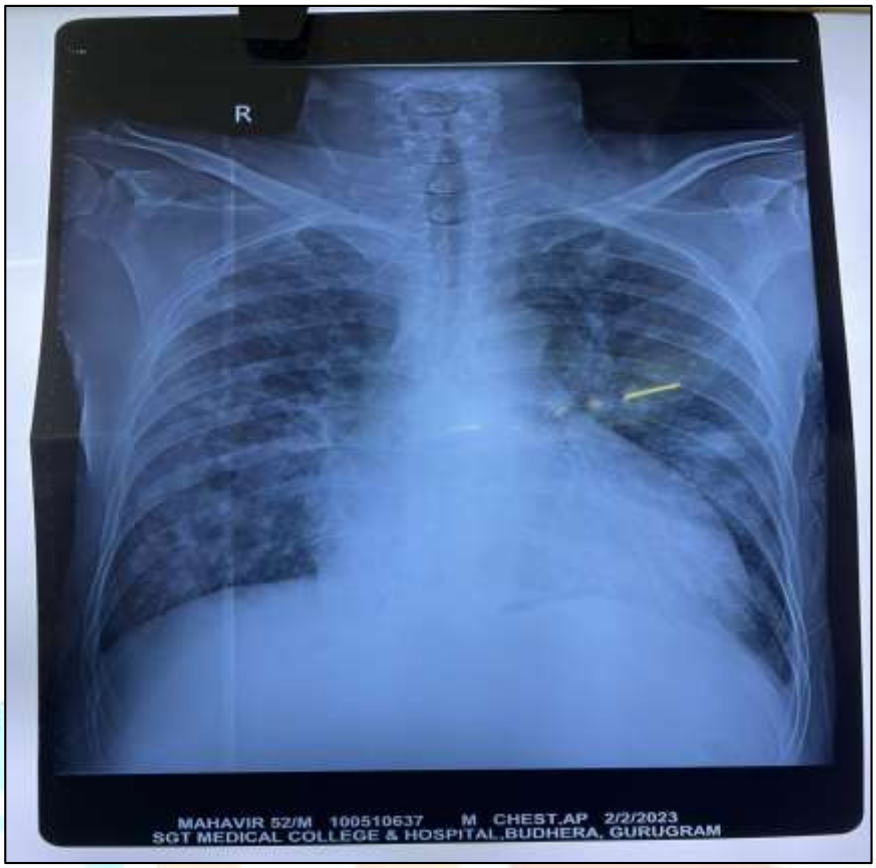
ABG shows pH- 7.41, PCO_2-41mmHg, PO_2- 67, HCO_3- 26.0mmol/L

Clinical laboratory examinations as on 3rd Feb 2023

Investigation	Values
CBC	
Hb	8.8 gm/dl
TLC	9210 cells/cumm
Neutrophils	90%
Lymphocytes	07%
Eosinophils	01%
Monocytes	02%
Basophils	00%
Platelet	1.55 l/cumm
RBS Count	3.32 x 106/mm3
HCT	29.5%
MCV	88.9 fl
MCH	26.5 pg
MCHC	29.8 gm/dl
RDW	14.3%.

Liver Function Test	
bilirubin total	0.4 mg/dl
bilirubin total	0.1 mg/dl
bilirubin indirect	0.3 mg/dl
SGOT	36.0 IU/L
SGPT	26.0 IU/L
Alkaline Phosphate	116.0 IU/L
Protein Total	5.1 L
Albumin	2.6 g/dl
Globulin	2.50 g/dl
A/G Ratio	1.04 g/dl
Kidney Function Test	
Blood Urea	69 mg/dl
Creatinine	1.3 mg/dl
Uric Acid	4.5 mg/dl
Protein Total	5.1 g/dl
Phosphorus	5.0 mg/dl
Calcium	8.6 mg/dl
Sodium	139.0 mmol/L
Potassium	5.3 mmol/L
Chloride	110 mEq/L
Peripheral Smear	normocytic normochromic picture
CRP	3.9 mg/dl
Iron Deficiency Profile	
Iron	22.0 µg/dl
TIBC	216.00 µg/dl
Transferrin	129.8 mg/dl
% Transferrin Saturation	10.2%
Ferritin	135.8 ng/ml
Vitamin B12	766.2 pg/ml
ESR	25mm/ 1st hr
HBA_1C	5.8%
Pro BNP	117.0 pg/ml

Chest X-ray:



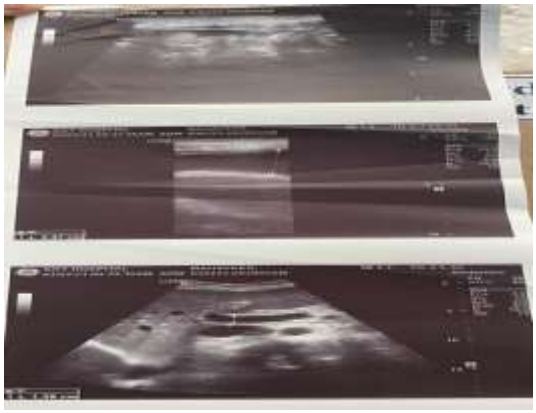
Findings: Cardiomegaly

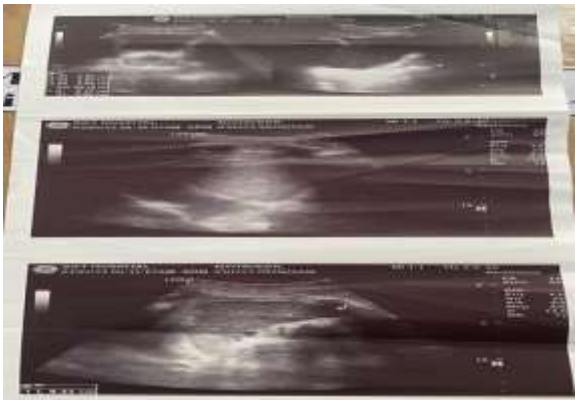
B/L heterogeneous opacity in the middle and lower zone

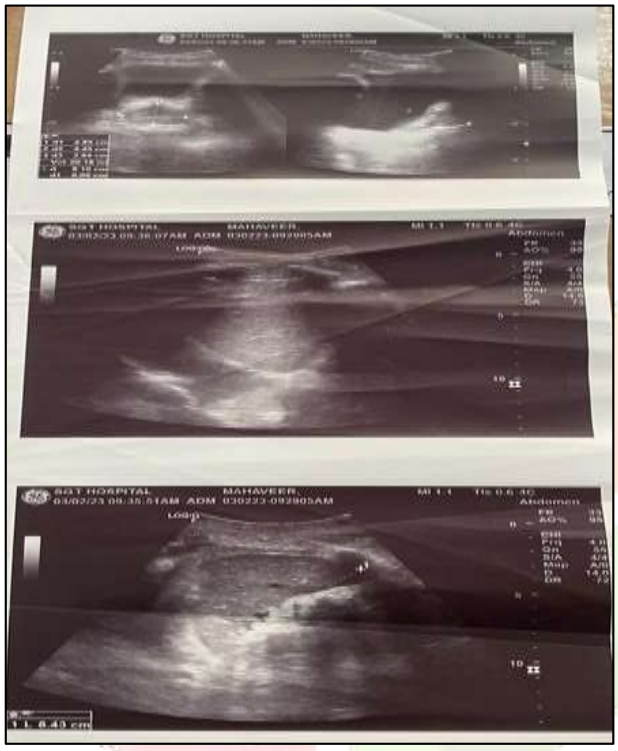
Intercostal space widening

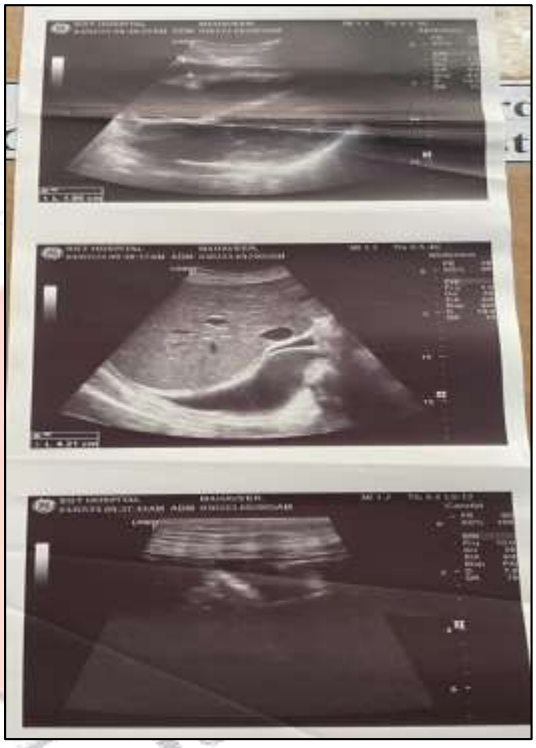
Impression: Suspected pneumonia

Ultrasound whole abdomen shows:









Impression: Coarse liver echotexture with prominent portal vein & hepatic vein.

Bilateral pleural effusion, Pericardial effusion and minimal ascites.

From the above clinical investigations, the patient was confirmed with the diagnosis of DILATED CARDIOMYOPATHY with TYPE-II DM with MODERATE ANEMIA and admitted to MICU to seek treatment for improvements and management of diabetes.

Day-1. In MICU, he underwent the following treatment:

Propped up position.

O_2 inhalation- 4 l/m

Restrict intake- 1.2 l/day.

Strict I/O charting

RBS charting (premeal)

Inj. Ceftriaxone, IV, 12 hourly.

Inj. Lasix 20mg IV, 8 hourly (if SBP> 120 mmHg)

Inj. Pantop 40mg, IV, OD

Inj. Emeset 4mg, IV, q8h

Inj. Actrapid according to the sliding scale

Neb. Ipravent TDS

Neb. Budecort BD

K^+ sachet, PO

Tab. Azee 500mg, PO, OD

Syp. Cremaffin, 20ml, OD

Tab. Ramipril, 2.5mg, BD

Tab. Ecospirin, 25mg, OD

Tab. Dapagliflozin, 10mg, PO, OD

DAY-2 General condition of the patient was average.

$E_4V_5M_6$

Orthopnea +

FBS- 168mg/dl

I/O- 200/750ml

Chest- B/L diffuse coarse crepitus +

Vitals: Temp- Afebrile

BP- 140/80 mmHg

PR- 80 bpm

RR- 16 b/m

SPO_2- 100% on 2L O_2

Treatment: CST as day 1

Day-4 (**6th Feb 2023)** After having undergone treatment in the MICU, the patient's condition improved, and he was able to maintain oxygen saturation above 90% for a longer period of time than usual. Then the patient was planned to shift to Male Medicine Ward for further treatment with the diagnosis-DILATED CARDIOMYOPATHY with TYPE-II DM with MODERATE ANEMIA (with suspected CLD and Portal Hypertension)

FBS- 127 mg/dl

I/O- 1150/2550 ml

Vitals: BP- 128/72 mmHg

PR-80 b/m

RR- 18 b/m

SPO_2- 98% on room air

Temp.- 98.6°F

Day-5 (7th Feb 2023)

The patient got shifted to Male Medicine Ward to seek treatment. Vitals at the time of transfer were: T-98.2°F, BP- 130/90mm/Hg, PR- 82b/m, RR- 18b/m, SPO2 – 99%. The investigations sent from the ward after shifting the patient to MMW are:

Investigation	Values
CBC	
Hb	8.1gm/dl
TLC	4800 cells/cumm
Platelet	1.76/cumm
RBC Count	3.0 x 106/mm3
HCT	26.1%
Liver Function Test	
bilirubin total	0.2mg/dl
bilirubin total	0.1mg/dl
bilirubin indirect	0.1mg/dl
SGOT	35.0IU/L
SGPT	40.0IU/L
Alkaline Phosphate	116.0IU/L
Protein Total	4.5L
Albumin	2.3g/dl
Globulin	2.20g/dl
Kidney Function Test	
Blood Urea	74mg/dl
Creatinine	1.4mg/dl
Uric Acid	5.4mg/dl
Protein Total	5.1g/dl
Phosphorus	4.4mg/dl
Calcium	8.7mg/dl
Sodium	134.0 mmol/L
Potassium	3.9 mmol/L
Chloride	108mEq/L

Treatment revised in ward-

Chest X ray PA advised

Propped up position

O2 Inhalation (SOS)

Fluid intake <1.2 L/day

RBS charting premeal

T. Pantop 40mg P/O OD

T. Dapaglifizon 10mg OD

T. Ramipril 25mg P/O BD

T. Metoprolol 25mg P/O BD

Cap Autrin P/O OD

T. Ecospirin AV 75/20 OD

T. Mucinac 600mg P/O BD

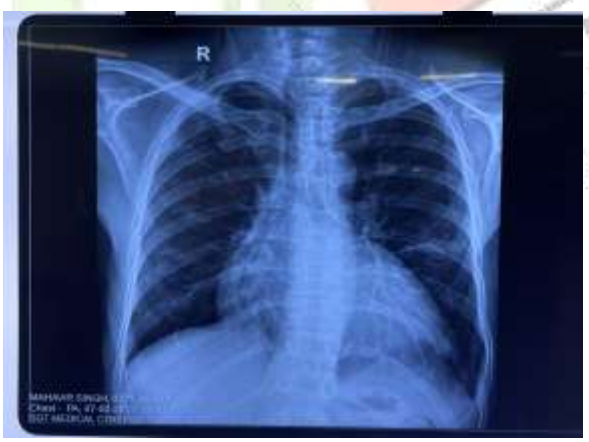
T. Neurobin Forte P/O OD

Inj Dytor 60mg IV (8:00am) & 40mg IV (4:00 pm)

T. Carca 3.125mg P/O OD.

Day 6 Patient started having complaints of blurred vision, for which an ophthalmology review was done that confirms the diagnosis of Diabetic Retinopathy and advised Eye drop –tamborim OD, Eye drop Nevanac TDS, eye drop Dorzox -T BD. Rest treatment was going in the same manner.

Chest Xray shows (7 Feb 2023)



Findings: rotation + on the right side

Cardiomegaly

DAY 8 General Examination

Pt. conscious & oriented

B/L Lower limb oedema +

B/L Hand oedema+

Tingling sensation B/L lower limb

Vitals: Temp- 98.4°F

BP- 150/98 mmHg

PR- 75 b/m

RR- 18 b/m

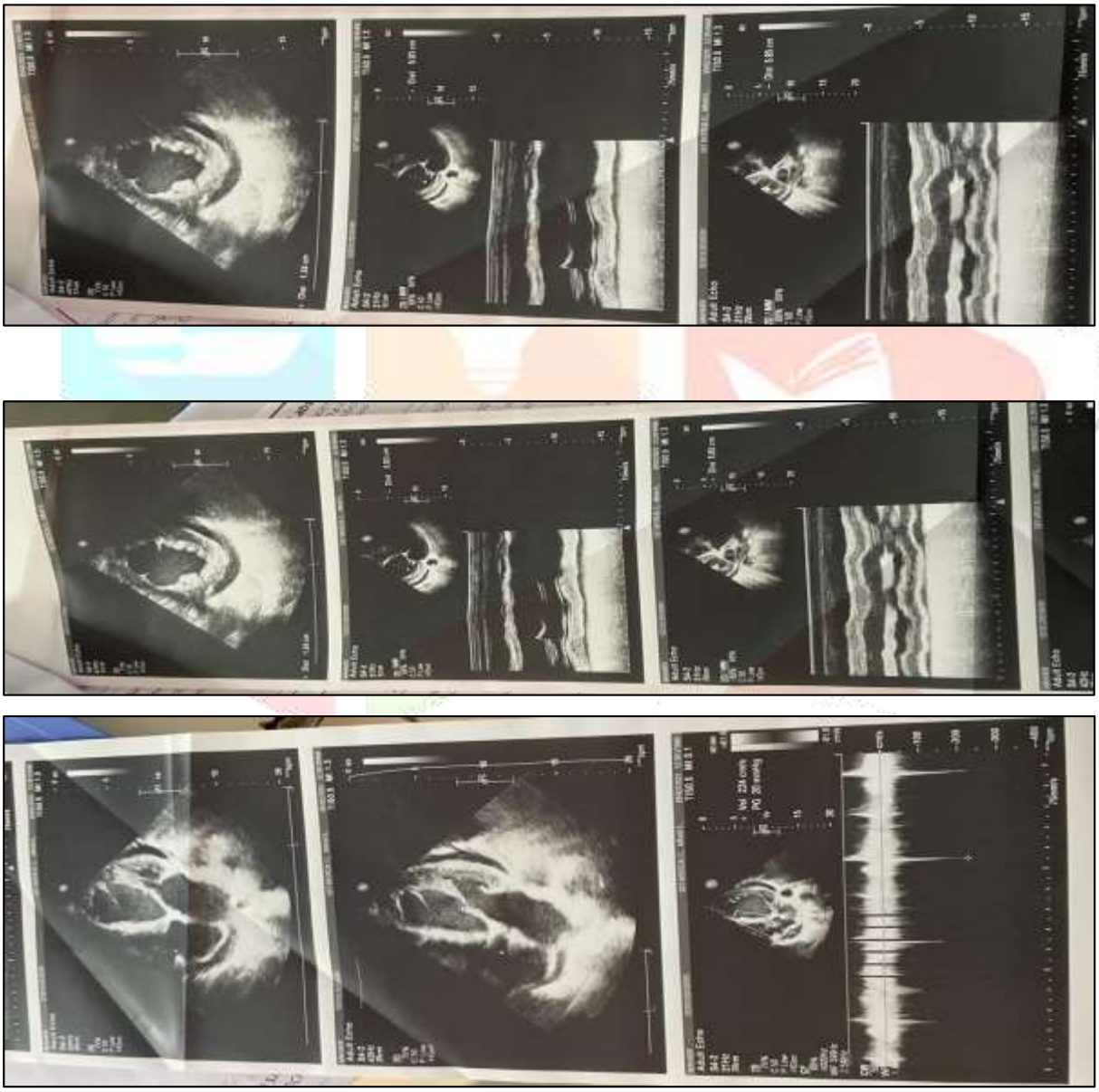
SPO_2- 98% on room air

RBS- 170 mg/dl

T. Ramipril 25mg &T. Metoprolol 25mg was withheld

Repeat 2D echo advised.

Repeat 2D echo shows – LVEF- 28%, enlarged LV & LA chambers, Dilated RA & RV, Moderate Pericardial Effusion, No feature of Tamponade, all valves normal, global hypokinesia, No LA/LV clot.



Day 9 after the radiological investigation patient was confirmed with the diagnosis.

K/C/O T2 DM with **LRTI**

with **DCMP**

with **Moderate MR/ Mild TR**

with **Moderate PAH**

with **PERICARDIAL EFFUSION**

with **MODERATE ANEMIA**

REVISED TREATMENT:

O_2 Inhalation (SOS)

Fluid intake <1.2 L/day

RBS charting premeal.

T. Pantop 40mg P/O OD

T. Ramipril 25mg P/O BD

Cap Autrin P/O OD

T. Ecospirin AV 75/20 OD

T. Mucinac 600mg P/O BD

T. Neurobin Forte P/O OD

Inj Dytor 60mg IV (8:00am) & 40mg IV (4:00 pm)

T. Carca 3.125mg P/O OD.

INJ. INSULIN HUMAN MIXTARD 16 units in the morning & 12 units at night before a meal.

The patient underwent the same treatment as day 9 for 3 days.

No further laboratory or radiological investigation was done.

Day 13(15 Feb 2023) Patient got discharged with the following medications:

T. LASILACTONE (20/50) p/o BD

T. CARCA 3.125 mg p/o OD

T. RAMIPRIL 2.5mg p/o BD

T. ECOSPIRIN AV 20/75mg p/o HS

CAP. AUTRIN p/o OD

T. NEUROKIND p/o OD

T. PANTOCID 40mg p/o OD

SYP CREMAFFIN 20ml p/o SOS

INJ. INSULIN HUMAN MIXTARD 16 units in the morning & 12 units at night before a meal.

Vitals at the time of discharge-

BP- 118/78 mmHg

PR- 84 b/m

RR- 18 b/m

SPO_2- 98% on room air

FBS- 180 mg/dl

Summary – A 51-year-old male presented to the emergency department with a 4-day history of breathlessness and b/l pedal oedema from the last 15 days. He is the son of type 2 diabetes mellitus parents and is on regular medication. He has a history of pulmonary tuberculosis, which was diagnosed in 2022, and had taken ATT for 9 months before stopping after consulting a doctor 6 months earlier. He had been a chronic alcoholic and smoker for ten years before quitting for two years. On admission, the vitals were: BP 150/84 mmHg, pulse 88 bpm, resp 18 bpm, SPO2 92 on 4 l of oxygen, temp 98.2 °F. Outside 2D echo reveals LVEF-25%, LA/LV dilated, mild congenital LVH, severe LV systolic dysfunction, mild carotid effusion +, moderate MR, mild TR, and moderate PAH are all symptoms of systolic dysfunction. The ECG shows sinus tachycardia and right ventricular hypertrophy. He was a chronic alcoholic and chronic smoker for 10 years and left drinking and smoking for the last 2 years. The patient got admitted to the MICU department for further management. After the patient's stay in the MICU and the treatments he underwent, his condition improved, and he was able to maintain oxygen saturation above 90% for a longer period than usual. The patient was then scheduled to shift to the male medicine ward to seek further treatment. In MMW, the patient underwent treatment for 5 days and was in close observation. After taking the treatment, the patient's general condition improved, and the patient got discharged from the hospital on 98% of SPO_2 on room air.

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