## Case Report

# Multidisciplinary Management of Maternal Near Miss (MNM) due to Peripartum Cardiomyopathy — A Case Report

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A Maternal Near Miss (MNM) case is defined by WHO as a woman who nearly died but survived a complication that occurred during pregnancy, child birth or within 42 days of termination pregnancy. Peripartum Cardiomyopathy (PPCM) is a rare type of idiopathic heart failure of unknown etiology that occurs in late pregnancy or 5 months postpartum with significant morbidity & mortality with an incidence of 2/3 cases in post-partum period. The hyperdynamic circulatory state of normal pregnancy can camouflage the heart failure. The case discussed here is a 32 year-old, G4P2L2A1, at 32 weeks of gestation with Type 2 Diabetes Mellitus (T2DM) & Hypertensive Disorders of Pregnancy (HDP) with previous 2 LSCS, presented to Emergency Room (ER) of Multispeciality Hospital with sudden onset of Shortness of Breath (SOB) with otherwise uneventful ante-natal period. She was put on elective ventilation due to persistent desaturation with Bilevel positive Airway pressure (BiPAP). FHS was localized. Echocardiography revealed severe generalized Left Ventricular (LV) wall hypokinesia, extreme tachycardia and LVEF(Ejection Fraction) of 30%. Mother crashed in ICU, ACLS was followed by LSCS. Next day, she was extubated successfully and gradually weaned from Medical Intensive Care Unit (MICU) to Maternity ward in a week. Neonates Septic Screen was positive. Excellent Neonatological care brought the neonate to oral feeds on D10. Mother & Neonate were discharged on D20. This is a unique MNM as both mother & baby were salvaged at 32 weeks of gestation with PPCM despite the crash in MICU.

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***Key words*** **: Maternal Near Miss, Peripartum Cardiomyopathy, Neonates Septic Screen, Left Ventricular Wall Hypokinesia.**

Peripartum Cardiomyopathy (PPCM) a rare type of idiopathic heart failure of unknown aetiology, 1st described in 1849[1], is due to combined effect of hyperdynamic state of pregnancy with its unique hormonal impact and a genetic pre-disposition with variable global incidence ranging from 1 in 102 to 1 in 4000, with higher preponderance in developing countries[2] and diverse clinical outcome from complete recovery to death. Risk factors include advanced maternal age, race, multiparity, multifetal pregnancy, socio-economic disparity and medical co-morbidities including Systemic Hypertension, Diabetes, Asthma and Anaemia and is often diagnosed retrospectively

The case discussion presented here is unique Maternal Near Miss (MNM) as both mother & baby were salvaged due to high index of clinical suspicion & multidisciplinary aggressive co-ordinated approach at 32 weeks of gestation with PPCM.

***Editor's Comment :***

- Cross Speciality urgent comprehensive management by Emergency Medicine Unit, Critical Care Unit, Anaesthetist, Cardiologist, Obstetrician & Neonatal Intensive Care Unit along with paramedical staff rescued the patient with Peripartum Cardiomyopathy and her preterm baby. This whole hearted co-ordination & co-operation of Hospital administration & staff is pivotal for such a life saving medical emergency.

## Case Report

A 30-year-old, G4P2L2A1, at 32 weeks of gestation with T2DM & HDP with previous 2 LSCS, presented to ER of Multispeciality Hospital with sudden onset of Shortness of Breath (SOB) with H/O regular uneventful ANC with Metformin, Labetalol & nutraceuticals. At ER, examination revealed pallor, tachypnoea with B/L diffuse coarse crepitations, SpO2-60% in room air, tachycardia, hypertension & hyperglycemia, dehydration & GCS within normal limits. ABG manifested uncompensated respiratory acidosis. FHS was localized.

Parenteral fluids, intravenous regular soluble Insulin, broad spectrum antibiotics, nebulization & BiPAP with & continuous urinary catheterization was done within 10 mins of admission at ER.

Counselling was done regarding critical condition and

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guarded prognosis of mother & foetus.

After being transferred to MICU, patient desaturated further. Elective ventilation & connection to ventilator machine with PRVC mode was done.

Echocardiography revealed severe generalized LV wall hypokinesia, extreme tachycardia & LVEF 30%.

Triple lumen central line was inserted in Right Internal Jugular Vein

Management continued with IV Fluids, Furosemide, Inotropes & Ivabradine.

PPCM was Suspected (Fig 1).

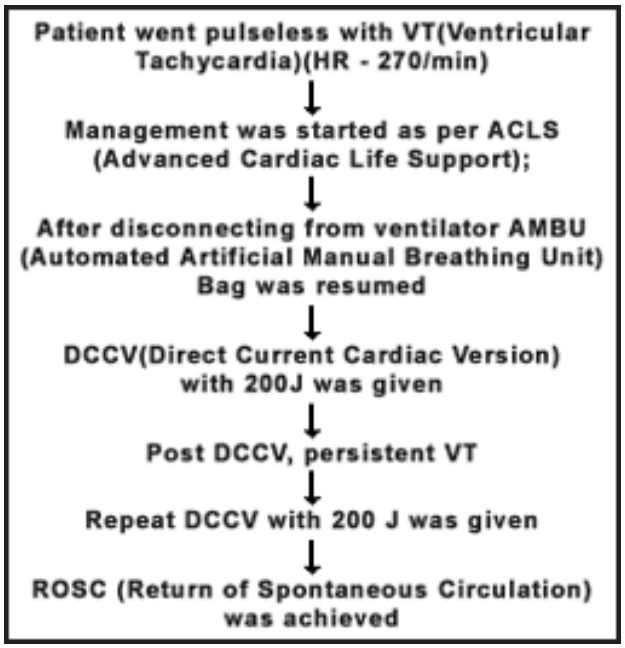


Fig 1 — Flowchart of Management Sequence done

Urgent USG confirmed fetal viability.

Consensus of delivery of the fetus was made by the team to improve maternal prognosis with High Risk Informed Consent.

Patient, with all ALS, was shifted to OT through sterile corridor. Emergency LSCS was done promptly through Pfannenstiel Incision. A 1.6 kg baby boy was delivered and handed over to the Neonatal Team. Skin incision to skin apposition was completed in 15 mins. Patient was shifted to ICU where PPH was managed with uterine massage, uterotonics and 1 unit of PRBC transfusion. Antibiotic coverage was escalated to Meropenem & Teicoplanin after antibiotic sensitivity of blood culture.

She was extubated successfully after 48 hours. Noradrenaline infusion was stopped. Arterial Blood Gas (ABG) normalized. Central lines were removed. She gradually improved with nebulization & Incentive spirometry and was shifted to Maternity Ward after 4 days. Fluids were restricted to 1.2litres /day with salt restricted diet. She was stabilized on Ivabradine, Torsemide, Spironolactone, Carvedilol, Enalapril, Wafarin (Keeping INR 2-2.5), Empagliflozin & Bromocriptine.

Baby did not cry at birth, appeared cyanosed with (Heart Rate (HR)-24/min & resuscitation continued with OGT feeding was increased with supplements (as breast feeding was disallowed based on Cardiologist's advice). By D10 of life, baby tolerated oral feeds on demand. Weight gain was appreciated (Fig 2).

Mother and baby were discharged in stable condition on D20 of baby's life.

## Discussion

The current diagnostic criteria for PPCM include[1] —

(1) Cardiac failure in a previously healthy woman in the late pregnancy or 5 months post-partum.

(2) Absence of a determinable etiology for cardiac failure

(3) Absence of demonstrable cardiac disease prior to last month of pregnancy

(4) Echocardiographic evidence of diminished left ventricular systolic function

Diagnostic echocardiographic criteria include Left ventricular ejection fraction <0.45 or M-mode fractional shortening <30% (or both) & end-diastolic dimension >2.7cms/$m^2$. ECG, MRI, endomyocardial biopsy can also aid in retrospective diagnosis. Although PPCM is increasingly recognized as important cause of HF in pregnant women without pre-existing CVD, aetiology and pathophysiology of the disease are still being established. An investigation of molecular biomarkers associated with PPCM can provide valuable insight into the molecular profile of the disease and improve prognosis. Cardiac angiogenic imbalance caused by cleaved 16kDa prolactin has been hypothesized to contribute to the development of PPCM, fuelling investigation of Prolactin Inhibitors like Bromocriptine for the management of PPCM[3] (Figs 3&4).

The way forward to treatment protocol in case of inadequate response to medical therapy can envisage cardiac re-synchronization, ventricular assist device and cardiac transplant.


Fig 2 — Flowchart of Neonatal Resuscitation sequence done

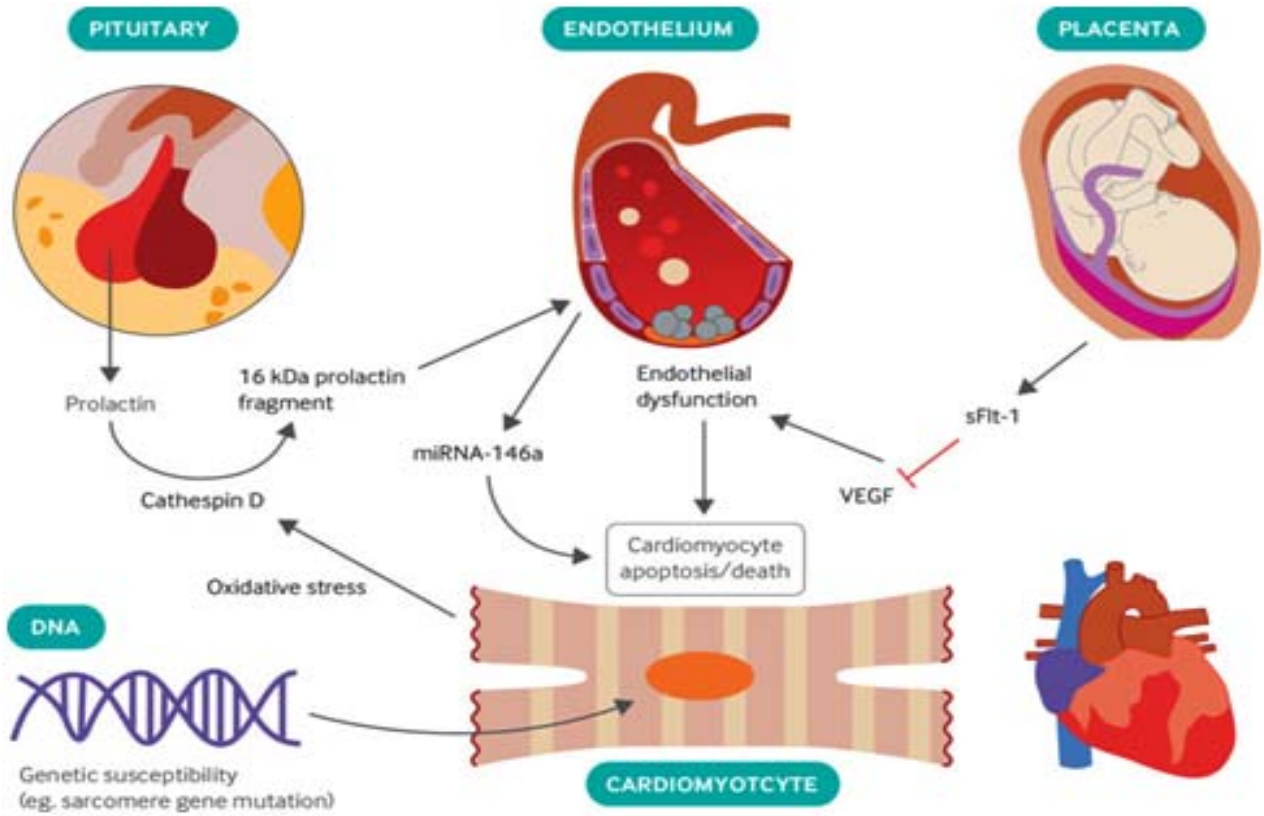


Fig 3 — Schematic representation of vascular, hormonal and genetic predisposition of PPCM

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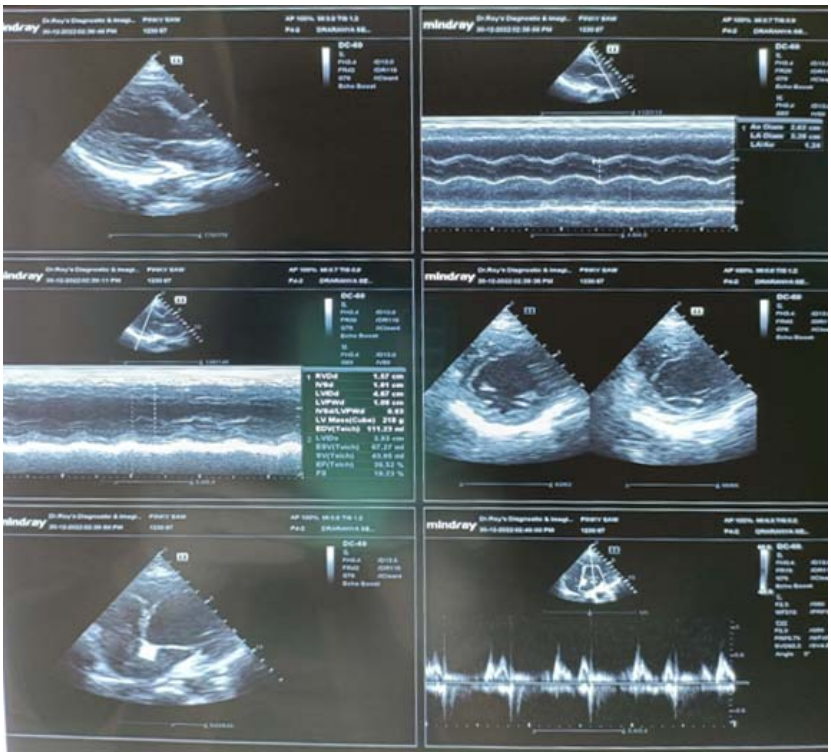

Fig 4 — LVEF improved from 30% to 39% at 3 months follow-up