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Research Article

Multidisciplinary Management in A Parturient with Peripartum Cardiomyopathy with Congenital Heart Disease-A Case Report

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ABSTRACT: Peripartum cardiomyopathy is a life threatening condition presenting in late pregnancy or postpartum. This case report describes anaesthetic management of 21year old primigravida at 31weeks 2days with peripartum cardiomyopathy and progressed to heart failure hence taken up for emergency cesarean section under general anaesthesia with rocuronium for rapid sequence induction. This case underscores critical need for high clinical suspicion and timely diagnosis.

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INTRODUCTION:

Peripartum cardiomyopathy(PPCM) is a form of dilated cardiomyopathy with an incidence of 1:300 0r 1:15000 manifests as acute heart failure in last trimester of pregnancy or early postpartum period[(1)].PPCM is a diagnosis of exclusion occurs due to genetic predisposition and oxidative stress leading to formation of N terminal 16-kDa prolactin an antiangiogenic factor which causes endothelial damage, vasoconstriction, dysfunction of myocardium[(2,3)].Goals of anaesthetic management include maintenance of optimal ventricular preload, after load to avoid anaesthesia induced myocardial depression[(1)]

CASE REPORT:A 21year old primigravida at 31weeks 2days,68kg weight came with history of 2episodes of elevated blood pressure and was started on tablet labetalol 100mg BD, she had a history of breathlessness NYHA II ,pedal edema at 29weeks,echo shows tiny patent foramen ovale left to right shunt, dilated left atrium, Ejection Fraction(EF)-55%,Grade 1 pulmonary artery hypertension and was started on tablet furosemide 40mg,steroid cover given taken up for emergency cesarean section in view of worsening maternal condition. Patient was started on nitroglycerine infusion at 5mcg/min, furosemide infusion at 10mg/hour and on continuous positive pressure ventilation+Pressure support, with progressive decline in patients clinical

status.Intraoperative deterioration of left ventricular function and marked reduction in ejection fraction around 30%,a real-time cardiology consultation done and proceeded with emergency caesarean section under general anaesthesia ,ASA IV,16G TUOHY(Portex epidural minipack ii,Smiths Medical,UK) epidural catheter at L2-L3 level, skin to space – 4cm fixed at 11cm,patient started on labetalol infusion at 5ml/min and continued on Pressure support.Modified Rapid sequence induction with intravenous rocuronium and under C-MAC videolaryngoscope guidance(Karlz Storz SE & Co.KG, Tuttlingen, Germany),patient intubated with ET-7mm fixed at 20cm,bilateral airentry confirmed. Central venous catheterization using high frequency linear(6-13MHz)ultrasound probe(Sonosite M-Turbo, Fujifilm sonosite inc, Bothell, WA, USA).A preterm boy baby delivered with an APGAR of 3/10,7/10.Baby intubated and shifted to NICU. Oxytocin infusion at 7.5units/hour. Serial ABGs done. Patient shifted with elective ventilation. patient extubated and started on tablet labetalol 50mg TDS, tablet nicardia 10mg BD. Postoperative echocardiography revealed left ventricular systolic dysfunction with an ejection fraction of 35%.Shifted to ward on 3rd day with regular follow up and planned for cardiac evaluation

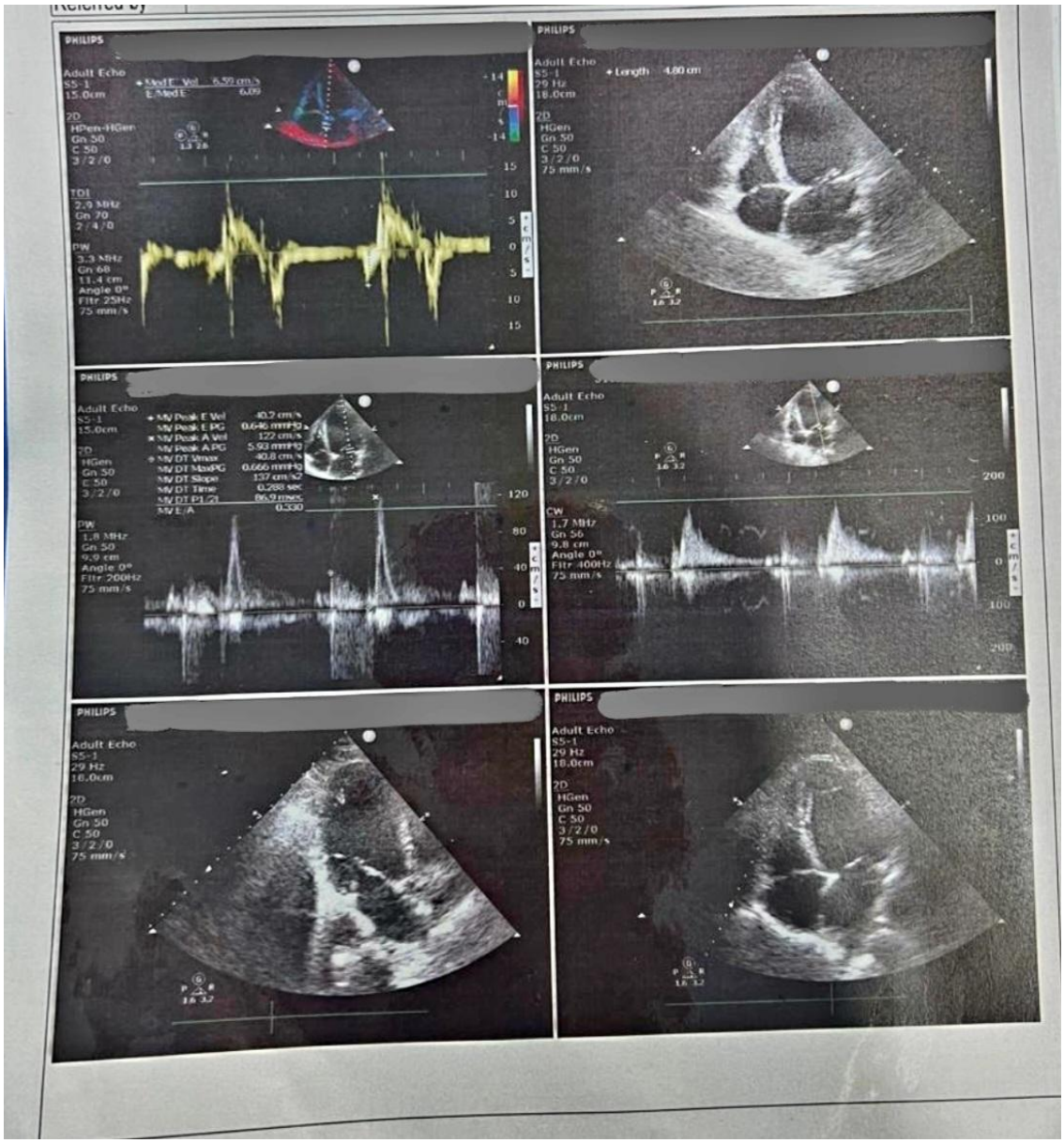


Figure 1:Intraoperative Echocardiography

DISCUSSION:

Management is symptomatic, multidisciplinary approach aims to reduce afterload, preload, enhance myocardial contractility, prevent arrythmia and hence treatment includes bed rest,loop diuretics, vasodilators, inotropic support, anticoagulants. If symptomatic management fails cardiac transplantation indicated. Termination of pregnancy is considered to avoid detrimental effects.[1,3]

Several case reports have shown induction using general anaesthesia, regional, combined spinal epidural.

Anaesthetic considerations include invasive monitoring, judicious fluid management, reduce afterload, preload, avoid myocardial depression [3,4]

Table1: Drug profile in the management of peripartum cardiomyopathy in pregnancy and postpartum

Drug	Mechanism	Comments
1.Beta blockers-Labetalol	decrease heart rate, myocardial oxygen demand	Cardio selective agents preferred in pregnancy
2.calcium channel blockers	inhibit L type calcium channels-vasodilation	nifedipine safe in pregnancy
3.Furosemide	inhibits sodium potassium chloride channels-diuresis, decreased preload	safe in pregnancy
4.Nitroglycerine	venous>>arterial dilator, decrease preload, pulmonary congestion	hypotension and reflex tachycardia
5.Sodium nitroprusside	potent arterial, venous vasodilation→decreased preload, afterload	avoid in pregnancy, fetal cyanide toxicity
6.ACE inhibitors	decrease afterload, preload	first line in postpartum, contraindicated in pregnancy
7.ARB inhibitors	decreases afterload	contraindicated in pregnancy

General anaesthesia was preferred in this case due to urgency of procedure, severity of peripartum cardiomyopathy-orthopnea. Smooth titrated induction to reduce intubation response. titrated volatile anaesthetic to avoid myocardial decompression. bolus of oxytocin causes hypotension, tachycardia, infusion is preferred. elective ventilation postoperatively with gradual weaning and extubation is preferred.[3]

A subarachnoid block can lead to catastrophic hemodynamic instability due to reduction in systemic vascular resistance and limited cardiac reserve[3].

Table2:Comparative overview of Anaesthesia strategy in peripartum cardiomyopathy

	Pros	Cons
General Anaesthesia	Definitive airway	Intubation response-increase sympathetic activity, increases afterload, oxygen delivery
Spinal Anaesthesia	Fast,no airway manipulation	Sudden drop in preload, afterload, reflex tachycardia
Epidural Anaesthesia	Gradual, titrated so no sudden drop in preload/ afterload	Slow onset of blockade

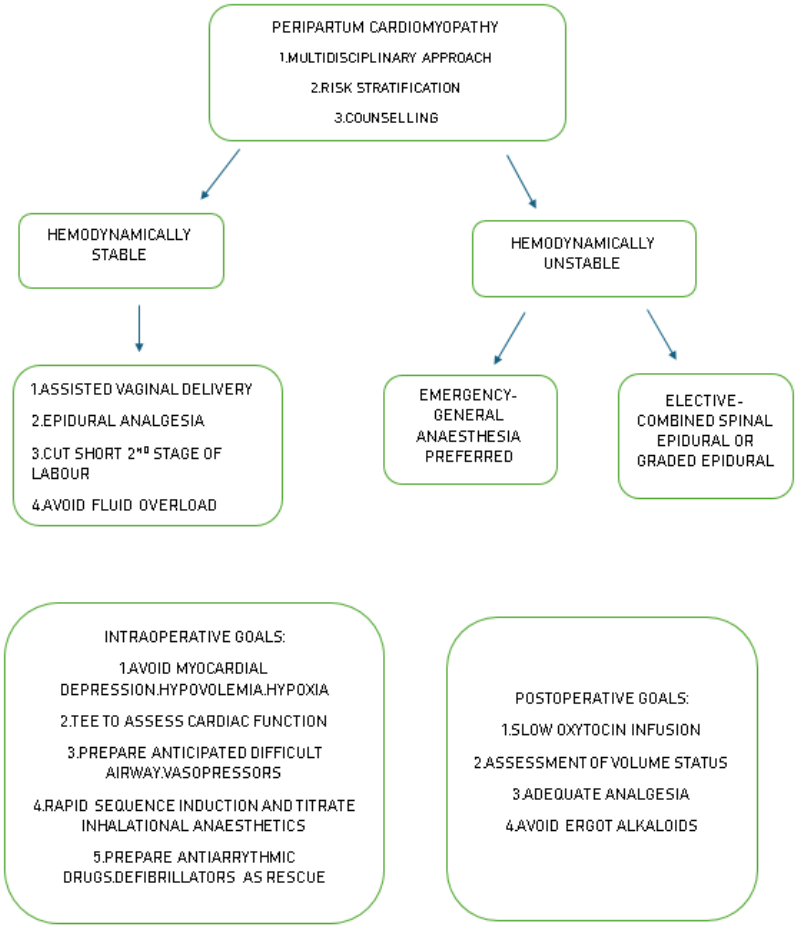
Table3:Cardiac grid framework for perioperative Management

Cardiac grid	Goals	Management
Rate	Maintain heart rate	Avoid, tachycardia, bradycardia, avoid intubation response
Rhythm	Maintain sinus rhythm, avoid arrythmia	Electrolyte abnormality
Preload	Reduce	Diuretics-furosemide Fluid monitoring-urine output, central venous pressure
Afterload	Reduce, reduce myocardial workload	Vasodilators-Nitroglycerine
Contractility	Maintain	Ionotropes-digoxin

Rapid blood transfusion or fluids boluses should be avoided since it jeoparadize myocardium by over distension and subsequent compensation of heart failure and third space redistribution of fluids can occur, potentially worsening pulmonary edema[3].

Almost 50%of the women with peripartum cardiomyopathy their cardiac function improves, however persistent left ventricular dysfunction can be seen even after 6-12months with an increased mortality of about 85% and it is an absolute contraindications for future pregnancies and may even require cardiac transplantation[3].

ANAESTHESIA CONSIDERATIONS OF PERIPARTUM CARDIOMYOPATHY[5]



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