

Peripartum Challenges in a Parturient with Cardiovascular Complications following Severe COVID-19 Infection

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INTRODUCTION

- Peripartum cardiomyopathy can contribute to significant morbidity and mortality. [1]
- Severe COVID-19 infection is associated with increased risk for myocardial injury and/or arrhythmias. [2]
- We report a case of cardiovascular complications following COVID-19 infection during pregnancy.

CASE PRESENTATION (1/2)

Preoperative Details:

- A 33-year-old G2P1 at 39w4d with PMH of recent severe COVID infection c/b dilated cardiomyopathy and suspected acquired intracardiac shunt admitted for induction of labor.

Notable Medical History:

- Admission at 31 WGA for SARS-CoV-19 infection
 - Complicated by ARDS from COVID pneumonia, dilated CMP, and atrial fibrillation with RVR.
 - TTE demonstrating a reduced LVEF to 45-50% and mild pulmonary hypertension.
 - Tenuous respiratory status requiring non-invasive PPV - nearly requiring intubation and ECMO several times, prior to eventual recovery.
 - Discharged on anticoagulation with SQ heparin due to a high risk of thromboembolism.
- Follow-up TTE demonstrated recovery of LV function with LVEF 55-59% and evidence of concentric LV remodeling and sinus rhythm.
 - Also notable for persistent mild pulmonary hypertension and a suspected supravulvar Gerbode defect (specifically membranous septal LV to RA defect).

CASE PRESENTATION (2/2)

Peripartum Planning:

- Multidisciplinary approach with inputs from:
 - Maternal-Fetal Medicine, Obstetrics, Anesthesiology, and Cardiology teams
- Admission one day prior to scheduled induction with planned start of induction overnight to facilitate a daytime delivery with all teams and support personnel available

Special Anesthetic Considerations:

- Arterial line placement prior to induction of labor
- Hemodynamic monitoring with minimally invasive cardiac output monitors via arterial line pulse contour analysis
- In-line filters utilized on all intravenous lines
- Labor analgesia with an epidural and use of saline for LOR
- Continuous pulse oximetry and telemetry monitoring

Peripartum Course:

- Uneventful labor course
- Successful vaginal delivery but was complicated by uterine atony and postpartum hemorrhage
- PPH managed with uterotonics, tranexamic acid, Bakri balloon, and 1 unit of PRBCs

Postpartum monitoring and care:

- Continued monitoring for hemostasis in the setting of PPH
- Continuous pulse oximetry and telemetry monitoring and minimally invasive hemodynamic monitoring with arterial line for 24 hours postpartum
- Discharged on postpartum day 2
- Follow-up in high-risk obstetric clinic given cardiac disease

DISCUSSION

- Risks associated with air embolism are significantly more detrimental in the presence of an intracardiac shunt and/or pulmonary hypertension. [3]
 - Mitigation with in-line IV filters and placement of epidural using saline as LOR technique.
 - Additionally, if cesarean section was required, avoidance of uterus exteriorization which can contribute to micro air emboli.
- Cardiovascular disease can present challenges for neuraxial techniques in the parturient population.
 - Considerations regarding anticoagulation management, inclusion of epinephrine in test dose, necessity for gradual sympathectomy, and inclusion or concentration of local anesthetic in epidural infusion.
- For parturients with known cardiovascular diseases, systems such as the Modified World Health Organization Classification of Cardiovascular Disease in Pregnancy can be used to help risk stratify patients and guide planning with regards to choice of center to labor and degree and extent of peripartum monitoring. [4]
- COVID-19 infection is associated with an increased risk for multiple cardiovascular complications. [5]
- Patients that have recovered from the acute phase of COVID infection may still be affected by long-term sequelae and can still be at higher risk for cardiovascular complications. [6]

CONCLUSION

- Long-term complications of SARS-CoV-19 on various organ systems are slowly becoming apparent.
- Our patient was found to have cardiomyopathy, pulmonary hypertension, and arrhythmia after COVID infection, although demonstrated recovery from most of her cardiac complications.
- It is difficult to predict the long-term sequelae and prognosis for future pregnancies for patients after COVID-19 infection.

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FIGURES

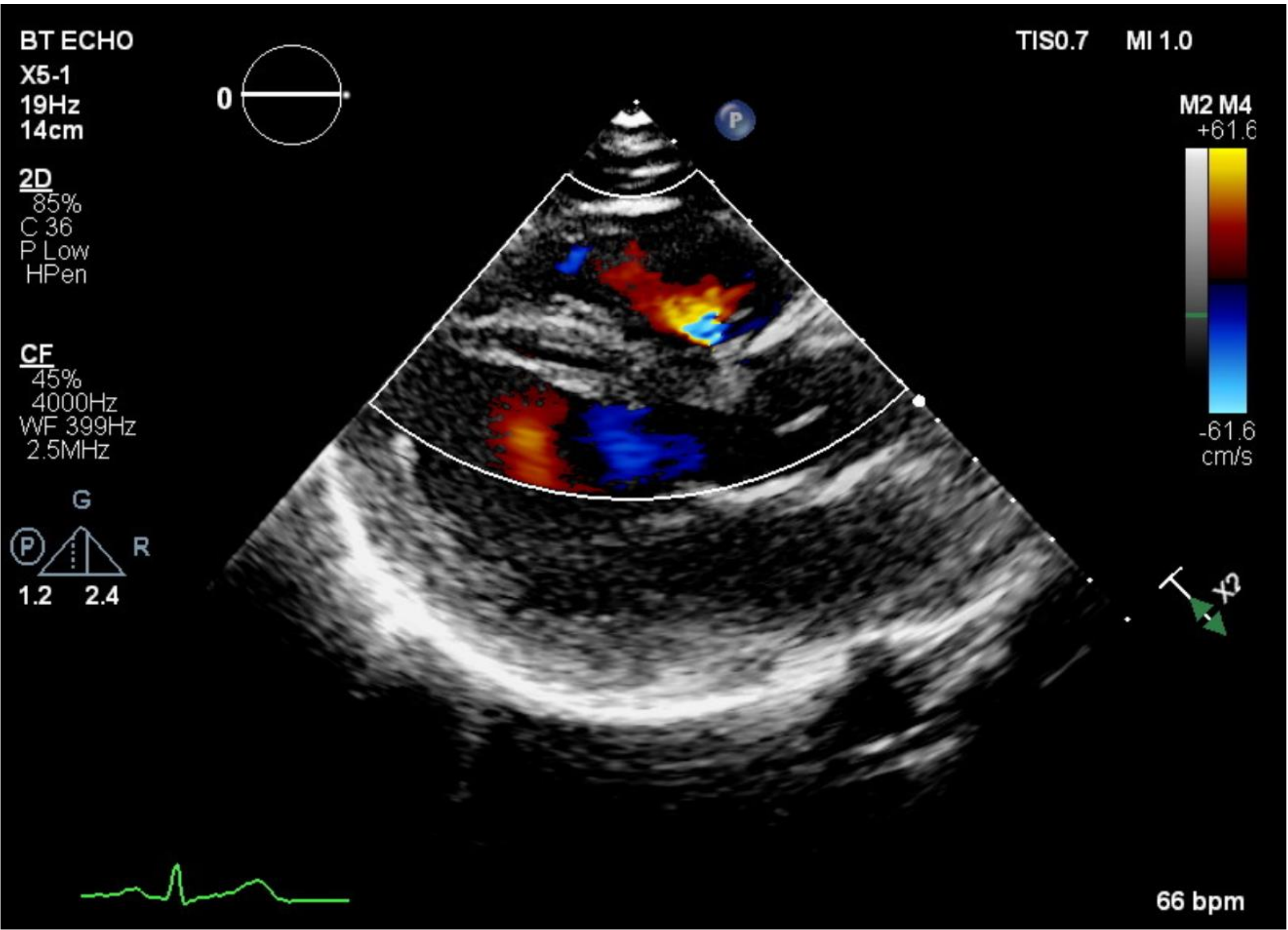


Figure 1:
Transthoracic echocardiography, parasternal long axis view demonstrating suspected abnormal jet from left ventricular outflow tract to right ventricular outflow tract.

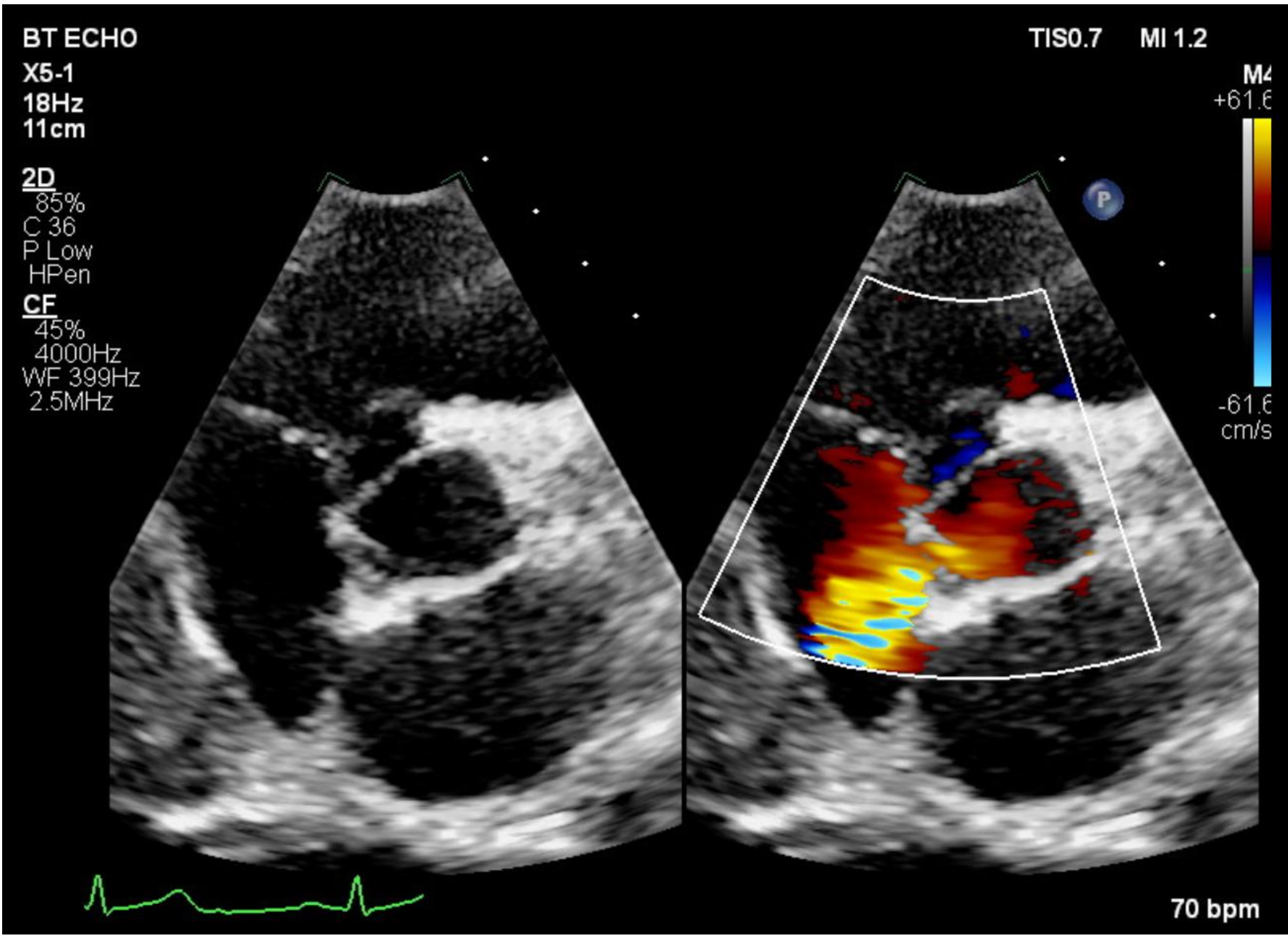


Figure 2:
Transthoracic echocardiography, parasternal short axis view, aortic valve level, demonstrating suspected abnormal jet from left ventricular outflow tract to right atrium.