

EDITORIAL COMMENT

M-TEER During Pregnancy

A Lifeline for Mother and Child

Alexandru Patrascu, MD, PhD, Neil P. Fam, MD, MSc



Since the first mitral valve transcatheter edge-to-edge repair (M-TEER) in 2003, the procedure has proven to be safe and effective in a myriad of clinical scenarios. Currently, M-TEER is the recommended treatment in patients with secondary mitral regurgitation (MR) who have persistent heart failure symptoms despite medical therapy.¹ Most of these patients are elderly with comorbidities, assessed by the heart team to be at high surgical risk. However, the less-invasive nature of TEER suggests potential benefits in other populations such as during pregnancy. The unique hemodynamics of gestation² may result in fluid overload in susceptible patients through the combination of increased cardiac output, blood volume, and heart rate, decreased peripheral vascular resistance, and activation of the renin-angiotensin-aldosterone system. It is therefore conceivable that pregnancy may exacerbate preexisting secondary MR, putting both mother and fetus in harm's way.

In this issue of *JACC: Case Reports*, Delhomme et al³ report the case of a 32-year-old woman with known dilated cardiomyopathy and moderate secondary MR, who underwent cesarean delivery at 27 weeks of her first pregnancy due to worsened MR with uncontrollable symptoms of congestive heart failure. She was considered to be at high risk of hemodynamic decompensation at the start of her second pregnancy, and received successful preemptive M-TEER at 8 weeks after heart team review. Improved MR and optimization of medical therapy managed to get the patient to the 29th week of pregnancy, when she again underwent cesarian section, this time for

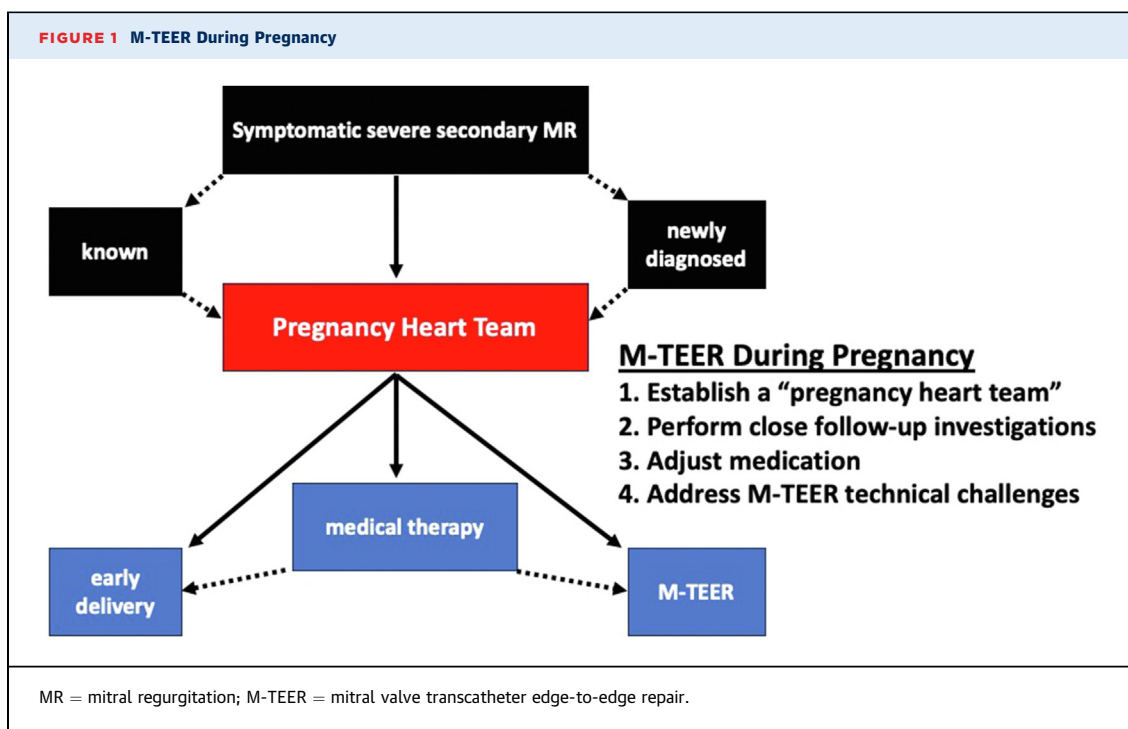
obstetrical reasons with good maternal and fetal outcome. Postpartum follow-up investigations confirmed good long-term M-TEER result and reinforced the initial decision for transcatheter therapy.

Although this report describes a single clinical case, it also highlights the bigger topic of cardiovascular disease during pregnancy, which is the leading cause of maternal mortality in North America.⁴ Similar scenarios in pregnant women with left ventricular dysfunction and secondary MR may be encountered in everyday clinical practice, and require a comprehensive multidisciplinary approach. Aside from general obstetrical recommendations, several pillars of decision-making and therapy should be addressed (**Figure 1**). Besides the preservation of maternal health, the goal of this approach needs to be either the enabling of pregnancy continuation to the scheduled delivery term, or the assistance to a feasible preterm delivery date that would give the fetus a fighting chance.

First, the concept of the “pregnancy heart team”⁵ needs to be established, which comprises not only cardiologists and cardiovascular surgeons, but also obstetricians and anesthesiologists. Depending on the stage of pregnancy, and whether or not secondary MR is known or first diagnosed through symptoms of acute heart failure, the pregnancy heart team needs to decide between conservative treatment, scheduled M-TEER, early fetus delivery, or potentially urgent M-TEER. Such multidisciplinary discussions might need to take place on a week-to-week basis in specific cases, as pregnancy is a dynamic process, and maternal adaptations may fail during its later stages. Second, continuous reassessment with routine blood and urine tests, extended lab results including N-terminal pro-B-type natriuretic peptide, liver and kidney function, fetal ultrasound plus maternal echo need to be performed regularly. Third, there needs to be consensus on medication adjustment, as most heart failure drugs are known to be embryotoxic.

From the Structural Heart Program, St. Michael's Hospital, University of Toronto, Toronto, Ontario, Canada.

The authors attest they are in compliance with human studies committees and animal welfare regulations of the authors' institutions and Food and Drug Administration guidelines, including patient consent where appropriate. For more information, visit the [Author Center](#).



Looking at current guidelines,¹ from the “big four” classes of heart failure medication, 2 are strictly contraindicated during pregnancy (angiotensin-converting enzyme inhibitor/angiotensin receptor blocker/angiotensin receptor neprilysin inhibitor and sodium-glucose cotransporter-2 inhibitors), whereas 2 (beta-blockers and mineralocorticoid receptor antagonists) may cause fetal growth retardation. Also, supportive treatment with loop diuretic agents may affect uteroplacental blood flow and should be used with caution. Vitamin K antagonist and direct oral anticoagulant agents for atrial fibrillation should be avoided, whereas low molecular weight heparin seems to be safe. Meanwhile, aspirin or clopidogrel, often recommended after TEER, do not seem to present an increased hemorrhagic risk. Fourth, technical challenges associated with TEER during pregnancy should be addressed. Interventional cardiologists need to rely more on transesophageal echocardiography guidance and minimize fluoroscopy, emphasizing general principles of imaging and radiation exposure: use of low-dose pulse fluoroscopy, tight collimation of area of interest, avoidance of angulations, placement of x-ray detector as close as possible

to the patient, and use of abdominal shields for the fetus. Considering that fetal organogenesis is complete by the end of the fourth month, fear of radiation should not deter the decision for TEER, if the intervention can dramatically improve maternal and fetal outcomes. Finally, there do not seem to be any major concerns with general anesthesia, as most anesthetics are administered for such a brief period that the potential for toxicity is minimal.

In summary, by adopting a multidisciplinary pregnancy heart team approach, the assessment of the individual risk-benefit ratio of TEER can facilitate timely decision-making, in the interest of both the mother and fetus.

FUNDING SUPPORT AND AUTHOR DISCLOSURES

Dr Fam is a consultant to Edwards Lifesciences, Abbott, Cardiovalve, Medtronic, and Tricares. Dr Patrascu has reported that he has no relationships relevant to the contents of this paper to disclose.

ADDRESS FOR CORRESPONDENCE: Dr Neil P. Fam, Division of Cardiology, St. Michael's Hospital, 30 Bond Street, Toronto, Ontario M5B 1W8, Canada. E-mail: neil.fam@unityhealth.to.

REFERENCES

1. Vahanian A, Beyersdorf F, Praz F, et al. 2021 ESC/EACTS guidelines for the management of valvular heart disease: developed by the Task Force for the management of valvular heart disease of the European Society of Cardiology (ESC) and the European Association for Cardio-Thoracic Surgery (EACTS). *Eur Heart J*. 2022;75:524.
2. Sanghavi M, Rutherford JD. Cardiovascular physiology of pregnancy. *Circulation*. 2014;130:1003-1008. <https://doi.org/10.1161/CIRCULATIONAHA.114.009029>
3. Delhomme C, Suc G, Thuillier C, et al. Mitral transcatheter edge-to-edge repair in a pregnant woman: procedure and pregnancy outcomes. *JACC Case Rep*. 2025;30(5):102995.
4. Gunja M, Gumas E, Masitha R, et al. Insights into the U.S. Maternal Mortality Crisis: An International Comparison. Commonwealth Fund. June 2024. Accessed October 27, 2024. <https://www.commonwealthfund.org/publications/issue-briefs/2024/jun/insights-us-maternal-mortality-crisis-international-comparison>
5. Regitz-Zagrosek V, Roos-Hesselink JW, Bauersachs J, et al. ESC Scientific Document Group. 2018 ESC guidelines for the management of cardiovascular diseases during pregnancy. *Eur Heart J*. 2018;39:3165-3241.

KEY WORDS mitral regurgitation, pregnancy, transcatheter edge-to-edge repair