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Expedited MitraClip: Rapid Evaluation, Treatment, and Discharge in the COVID-19 Era

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ABSTRACT

Undertreatment of patients with severe mitral regurgitation (MR) has been exaggerated during the coronavirus disease of 2019 (COVID-19) pandemic. Expedited workup and shortened post-procedural hospital stay after percutaneous mitral valve repair (PMVR) would be incredibly helpful to relieve the constrain in the era of the COVID-19 pandemic and immediately afterward. We report a patient who underwent PMVR with a simplified pre-operative workup, a shortened hospital stay, and expedited discharge.

1. History of presentation

An 86-year-old male with recurrent congestive heart failure (CHF) and New York Heart Association (NYHA) class III symptoms, due to severe secondary MR, with LVEF of 40% for an elective Mitra clip implantation. Outside hospital echocardiogram showed severe MR confirmed with a primary etiology of functional MR with no anatomic contraindication to a MitraClip procedure. Two days following the referral, the patient was evaluated via a telemedicine consult.

2. Past medical history

His estimated Society of Thoracic Surgery (STS) risk score for MV repair was 4.2%, based on a medical history of coronary artery disease status post percutaneous coronary intervention, atrial fibrillation, hypertension, diabetes mellitus type 2, chronic obstructive pulmonary disease and obstructive sleep apnea.

3. Investigations

The patient was moderately frail according to objective frailty assessment. He was scheduled for a transesophageal screening echocardiogram with the plan to perform a Mitra clip at the same time if the anatomy was favorable. Before the presentation, he had baseline labs, EKG, a COVID19 test performed and was instructed to self-quarantine.

4. Management

Six days after his telemedicine consult, the patient presented to our institution. Under general anesthesia, a TEE was performed, which confirmed severe MR with severe left atrial dilatation, mitral annular dilatation, mildly apically tethered mitral leaflet (tenting), and minimal relative focal prolapse of A2 and P2, and most of the MR jet along the A2 and P2 coaptation (Fig. 1). The decision was made to proceed with the transcatheter edge-to-edge mitral repair. Two clips were placed using the MitraClip XTR and NTR clip delivery systems. The clip deployment was satisfactory without any complications. Post-procedure echocardiogram revealed mild MR, mean MV gradient of 3 mmHg, and trivial pericardial effusion. The patient was transferred to the catheterization laboratory recovery area. On admission, a baseline EKG was performed. A repeat EKG was done after 4-hour post-procedure, and no changes were noted. Bedside TTE confirmed clip placement with no evidence of pericardial effusion; the patient was subsequently ambulated. After confirming each of these milestones, he was set up for same day discharge (SDD).

5. Follow-up

After SDD, the patient was followed with a home continuous ECG system (Zio AT ® Patch iRhythm Technologies, Inc.) for 7-days. This system alerts the patient and provider to conduction changes in real-

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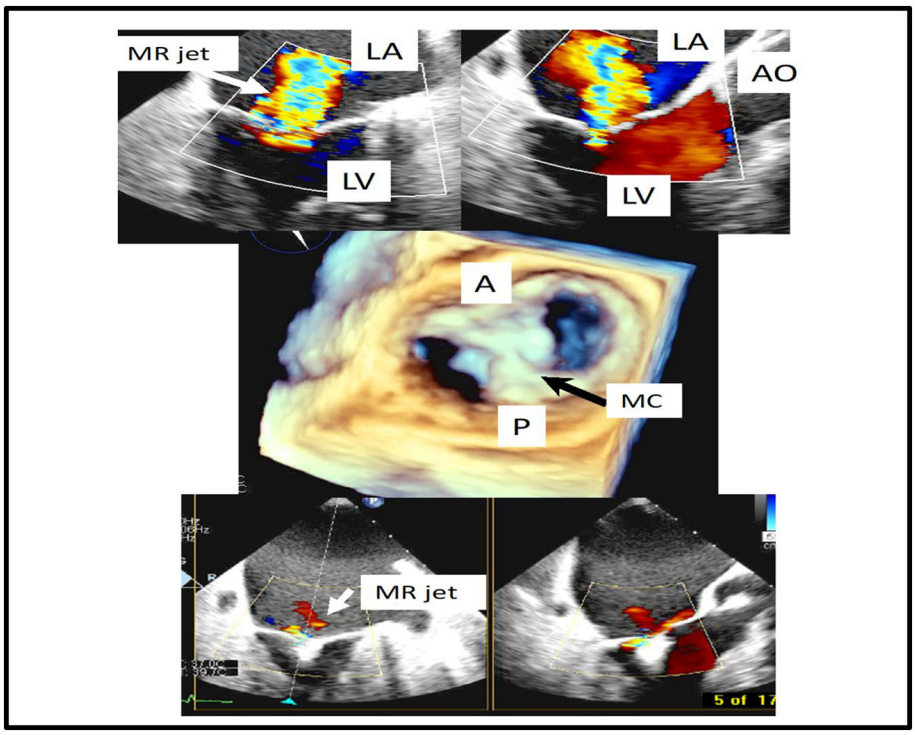

Fig. 1. Upper panel: Biplane MV commissure view and LVOT view. Note: Large central MR jet and A2 and P2 coaptation in systole, middle panel: 3D mitral valve (surgeon's view) with mitral clip placed on A2 and P2 and double mitral orifice in diastole. Lower Panel: the same view as the upper panel; note MR jets has almost disappeared with trivial MR in systole.

time. This is a standard follow-up for all patients discharged within five days of catheter-based or open surgical valve replacement at our center. Besides, the patient had a virtual visit follow-up on post-procedure days 1 and 2. After a follow-up duration of 10 days, the patient continues to do well without the need for rehospitalization.

6. Discussion

As a result of the COVID-19 pandemic, our structural heart program has attempted to adopt a minimal inpatient footprint strategy. This protocol includes limiting the use of resources, limiting the number of areas that our patients visit, and limiting their time in the hospital. We have adopted this approach for multiple reasons. First, even after the pandemic's effects lessened, many areas of our hospital where structural heart patients are typically managed had been repurposed to the management of COVID patients and were at high capacity or unavailable. Also, the population of patients undergoing structural heart procedures is overwhelmingly advanced in age with a high prevalence of hypertension and diabetes, and therefore they are at too high risk for the adverse outcome if infected with COVID19. Moreover, to protect patients, families, and the hospital staff, visitors, were not allowed in the hospital. Thus all hospitalized would be separated from their loved ones during their time in the hospital.

7. Streamlined workup

Our program has required all patients to undergo a screening TEE before transcatheter mitral valve intervention in the recent past. However, given expanded indications, advances in the technology, and the new realities of the COVID era, we now plan to schedule patients who had a diagnostic TTE demonstrating severe mitral regurgitation and preliminary classification of mitral anatomy to exclude unfavorable anatomy for MitraClip for confirmatory TEE with possible clip for a one-stop procedure (Fig. 2). Recognizing that a small proportion of patients will be rejected on the table immediately before the procedure. However, this strategy is no different from managing ischemic cardiac disease when a patient who has suspected coronary disease after a stress test is scheduled for diagnostic cardiac catheterization and possible percutaneous coronary intervention.

During the pandemic's peak, a few patients referred to our center with severe MR were successfully managed with this protocol. Post-procedure, there were no complications or reported adverse events. The intent of the present work herein is to demonstrate the safety and feasibility of SDD post MitraClip procedures. This report offers an alternative for treatment in patients who are in the most need of intervention during the ongoing pandemic.

8. Integration of telehealth

To further expedite treatment, the patient was evaluated via a virtual telemedicine consultation. Besides, the patient was followed remotely with virtual telehealth follow-up visits and continuous remote cardiac monitoring.

9. Conclusions

This case illustrates that PMVR with MitraClip with limited inpatient care, including same-day discharge, is safe and feasible in a group of well-selected patients.

Declaration of competing interest

Mark J Russo, MD, MS, serves as a speaker for Edward Life Sciences and Abbott Laboratories. All other authors have no disclosures to declare.

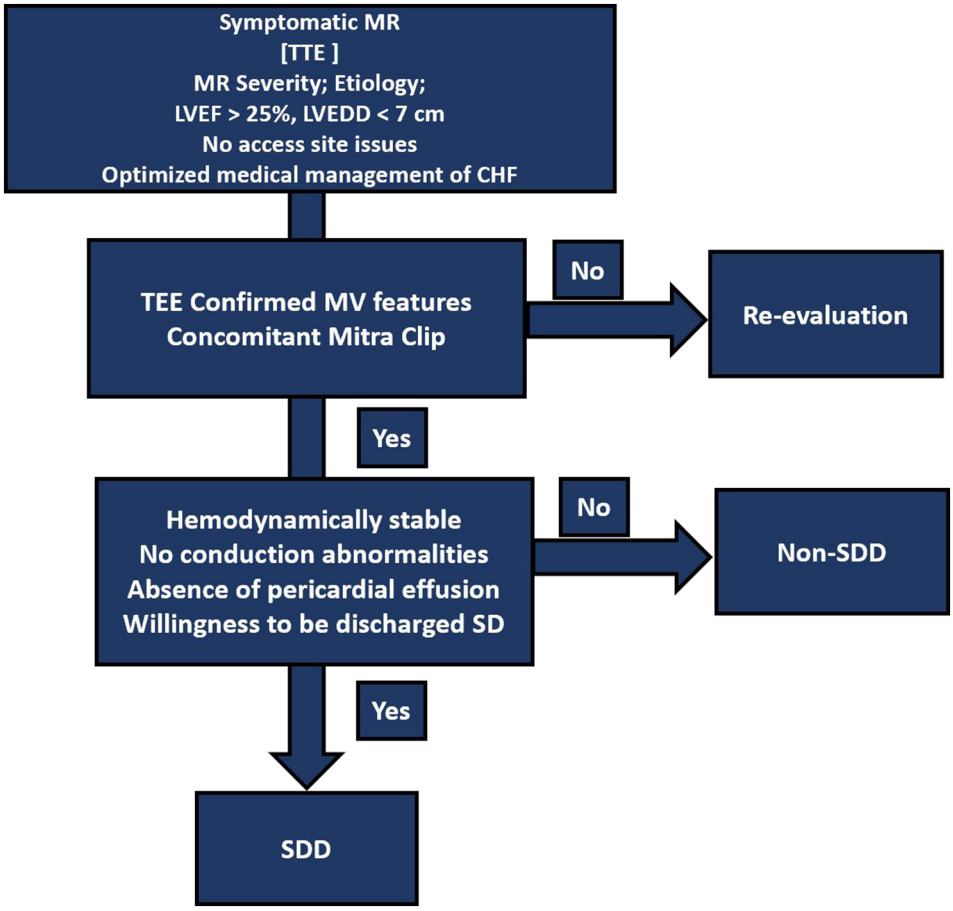

Fig. 2. Proposed workflow for patients referred for PMVR with MitraClip during the COVID pandemic.