EDITORIAL COMMENT

Better Safe Than Sorry in the Transcatheter Mitral Era*
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Transcatheter edge-to-edge repair (TEER) has grown exponentially since the results of the COAPT trial were published.1 This has led to an increase in the number of high-risk patients who have been successfully treated but has consequently resulted in a higher number of surgical bailout procedures, especially those brought about by leaflet tears or single-leaflet device attachment.

In this issue of JACC: Case Reports, Wedin et al elegantly describe an extremely rare case of MitraClip embolization. The heart team discussed the patient and deemed him at high operative risk. He underwent a TEER with initially good results. However, hours after receiving the implant, the patient experienced heart decompensation caused by severe mitral regurgitation and clip detachment. The case was unusual because detachment of the clip, rather than severe mitral regurgitation, somehow contributed to a malignant ventricular arrhythmia, which in turn contributed to rapid hemodynamic deterioration. After a new heart team discussion, the patient underwent rescue surgery to replace the mitral valve and survived with a quite uneventful postoperative course. The postoperative course was surprisingly different from the one predicted by the EuroSCORE.

Wedin et al2 concluded that there is a potentially growing ethical issue in the expanding transcatheter era, when high-risk patients may become candidates for open-heart surgery, and emergency open-heart surgery could be successfully performed in high-risk patients.

First, this case provides proof of concept that high-risk patients are not inoperable or, rather, are operable with an acceptable risk. Second, in patients affected by degenerative mitral valve disease, repair after TEER is rare and not impossible after a leaflet tears. Third, from a technical point of view, leaflet detachment or leaflet tear are events that rarely happen;3-6 but especially in patients where the chances of a successful surgical bailout procedure are low, leaflet insertion must be evaluated more carefully before clip release.

The patient treated in the report was not a typical COAPT candidate because he was affected by degenerative mitral regurgitation. In this subgroup of patients, if the final residual mitral regurgitation result is appropriate, several registries agree that this result can be maintained for years; thus, treatment is compatible with the life expectancy of older patients. The patient in this case report had a EuroSCORE II of 11.77%, and his main comorbidities were pulmonary hypertension and kidney impairment. This EuroSCORE II calculation result seems considerably higher than would be expected from the description of the patient’s associated pathologic conditions, and there may have been other comorbidities not explicated in the paper. Indeed, an 82-year-old patient with severe renal impairment and pulmonary hypertension has been an adequate surgical candidate for ages. There is, perhaps, a tendency to attempt transcatheter solutions in patients with “suboptimal risk” profiles, which is understandable, but must be stated clearly before. We all know that the gold standard for degenerative cases is a perfect surgical repair, which is feasible in the majority of cases. In these patients, the rate of surgical repair after transcatheter edge-to-edge repair is less than 5% in experienced centers. In case of leaflet rupture, repair is almost impossible and

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there have been no published cases of surgical plasty after tear. We therefore have to clearly talk to patients and always make them aware that a surgical option is present, but repair would not be an option anymore in case of failure.

Last but not least, from a technical point of view, checking the amount of leaflet inserted into the device is of paramount importance. Suboptimal grasping or clasping is the anteroom of detachment. In this particular case, the leaflets were perhaps too fragile and both leaflets tore. Mitral tissue quality is unpredictable and does not correlate with the patient’s age or comorbidities. The incidence of single leaflet attachment is higher in degenerative cases (1% in functional cases vs 5% in degenerative cases). Again, from common experience, the lack of an adequate amount of tissue inside the device leads to increased stress on the leaflet and increases the risk of detachment. Several factors are involved in evaluating leaflet inclusion. Foremost is the quality of imaging. In a patient with a suboptimal acoustic window or if the imager is not experienced, it is difficult to quantify the amount of leaflet inserted. To check and confirm adequate grasping, recording of the grasping sequence and measuring leaflet length before and after closure are mandatory. Another maneuver is to leave the clip partially opened (to 60°) to better evaluate leaflet grasping. Another factor is the difficulty of the grasping maneuver and the number of attempts. It is commonly observed that the greater the technical difficulty (due to imaging or suboptimal trajectory), the greater the tendency to immediately close the device fully, avoiding the possibility of a better grasping evaluation with a partially opened clip. Other than that, a difficult or “suffered” grasping leads the operator not to optimize or attempt a second, better grasping. With new devices, we have independent grasping and clamping, allowing the possibility of optimizing leaflet insertion, and we have to use these devices if necessary.

Also, cardiac performance and the eventual need for a bailout intervention must be considered. Logically, a patient with functional disease and an ejection fraction of 20% has less chance of surviving an intervention than does an 80-year-old with degenerative mitral regurgitation and a good ejection fraction. The patients with these 2 profiles have to be treated in 2 different ways. In patients for whom a bailout procedure is not a real option, leaflet grasping has to be even more carefully evaluated than in patients for whom bailout is possible.

We have to tailor our strategy according to the anatomy of the valve, the origin of disease, and also the actual condition of the patient and the environment of the intervention. With a good acoustic window in degenerative, thickened, but not calcified leaflets, we can afford an optimization strategy with different attempts at repair. The risk of a tear is lower, but the risk of detachment is higher. However, imaging is the most critical step, especially in cases where there is only fragile function of the fibroelastic leaflets and in patients with low ejection fractions. The better our ability to locate a transseptal puncture, the better our ability to prepare the trajectory in the left atrium. It is mandatory that the imager remember to record the grasping step so that it can be reviewed. In these cases, bailout surgery is not an option, and the risk of tearing with different attempts is real. We therefore have to prepare for a smooth procedure with the fewest number of optimized attempts.

In the transcatheter edge-to-edge era, we have to carefully inform the patient that despite the high risk of the surgical intervention, conversion is still possible. There is also a tendency to leave some patients in the moderate- to high-risk group with the transcatheter option when a surgical option is also feasible. To decrease surgical conversion and optimize results, we have to tailor our grasping or clamping strategy according to the quality of imaging, leaflet tissue, and cardiac performance. Better a safe grasping evaluation than sorry for a surgical intervention where a degenerative valve has been replaced.

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