Mitral regurgitation in a complex clinical setting: the importance of a patient-tailored approach

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Summary
Surgical mitral valve repair is the preferred therapeutic strategy for mitral regurgitation caused by Barlow’s disease because of the complex valve anatomy. We present the case of a 64-year-old male with a newly diagnosed lung cancer who was successfully treated with a transcatheter MitraClip for his severe symptomatic Barlow’s mitral valve disease before planned thoracic surgery. This therapeutic approach was chosen to correct effectively the mitral regurgitation and, more importantly, to reduce the complications and perioperative risk during thoracic surgery, as well as to save time owing to the rapid recovery. The patient’s postoperative course was uneventful. In this case report it is shown that the therapeutic strategy should be always adapted to the patient. Choosing an alternative, transcatheter technique seems to offer a very good outcome in selected patients with severe valve dysfunction waiting for a high-risk and urgent non-cardiac procedure. As a result, we believe that this approach should be evaluated and if appropriate offered in such cases.

Keywords: MitraClip, transcatheter mitral valve repair, lung cancer, Barlow’s disease, mitral regurgitation, lobectomy

Case description
A 64-year-old man with a progressively worsening degenerative mitral regurgitation was referred to our cardiac surgery department for an elective surgical mitral valve repair. The patient was known for a history of Barlow’s disease with bileaflet prolapse and thickening of the leaflets due to the myxoid degeneration (fig. 1). The last echocardiography showed severe mitral regurgitation and his symptoms worsened over recent months (New York Heart Association class II–III). The patient was always clinically euvoaemic. His only medication was 2.5 mg lisinopril for hypertension and 0.4 mg tamsulosin for benign prostatic hyperplasia. After a multidisciplinary heart team discussion, a minimally invasive surgical mitral repair was recommended (ESC Guidelines Indication I, Euroscore II: 0.63%).

Preoperative thoraco-abdominal computed tomography (CT) angiography, which is routinely performed in our centre as a part of the preoperative diagnostic work-up be-
According to the TNM classification of the tumour was pT2b pN1 (2/17) L1 V1 G3. The next day, the patient was discharged from the intermediate care unit to a regular ward. The rest of the postoperative course was uneventful.

**Figure 1:** Pre-operative transoesophageal echocardiography showing severe mitral regurgitation with a bileaflet prolapse.

**Figure 2:** A 34.7 × 32.1 mm left upper lobe lung mass on preoperative thoraco-abdominal CT angiography.
The patient remained stable and was discharged home at day 8 after the lobectomy, day 16 after the mitral clipping. The postoperative antiplatelet therapy regimen was aspirin alone. Currently, he is in a very good condition and free of any cardiac or respiratory symptoms 5 months after the first procedure.

Discussion

The patient-centred approach gains importance in complicated cases like ours. Innovation and experience are considered to play a key role in the decision making process, giving more opportunities in centres with subspecialists.

To analyse the dilemma in the presented case, the therapeutic options discussed were:

Heart surgery before the lung surgery
Barlow’s mitral valve disease is considered surgically very complex [1]. From experience in high-volume mitral valve disease centres, the procedure often requires multiple different techniques and also an experienced surgeon to achieve a successful repair. The patient with advanced disease should be therefore referred only to the centre with specialists in mitral valve therapy. In our experience, recovery time after open valve reconstruction or replacement often means days to weeks till the next high risk procedure is recommended.

Lung surgery before the heart surgery
According to preoperative cardiac risk assessment for a non-cardiac surgery, patients with active or high-risk cardiac conditions require preoperative correction or identification of alternative nonsurgical management strategies [2]. Therefore, this approach is not considered in patients at high risk due to a valve disease.

Combined surgery
Preferably, patients with a newly diagnosed lung mass and cardiac disease not requiring an urgent intervention could be evaluated for a combined procedure. The limited numbers of studies available showed that concomitant cardiac and thoracic surgery is an option for only a subset of patients [3–5]. However, these studies had controversial results. It was shown that concomitant aortocoronary bypass surgery and oncological pulmonary resection while on cardiopulmonary bypass significantly increases the incidence of the postoperative complications and mortality rates [3, 4]. However, another study showed that concomitant cardiac valve replacement could be safely performed without increasing postoperative complications and mortality rates [5]. Because of these contrasting findings and the complexity of the Barlow valve anatomy, further studies need to evaluate the benefit of such specific combined surgeries.

Transcatheter valve repair before the lung surgery
In the literature, MitraClip, compared with open surgery, for degenerative mitral regurgitation is associated with greater mitral regurgitation recurrence and reduced survival beyond 1 year of follow-up [6]. However, this approach was considered as the most favourable option in this case. From experience in our high-volume centre, the effect of the intervention is immediate. Moreover, the recovery time after the transcatheter procedure is very short (mean time 2–3 days). Therefore, this approach was chosen as the best time-saving option with the fastest correction of the mitral regurgitation in addition to minimised peri- and postoperative complications.

Conclusion

In this report, we point out the importance of the adaptation of therapeutic strategy to the patient. To the best of our
knowledge, a surgical strategy seems to offer an excellent outcome in patients with severe mitral regurgitation. However, the whole surgical strategy should be reconsidered in patients with an indication for a high-risk non-cardiac procedure with the aim to minimise the symptoms and perioperative cardiac risk. As shown, the MitraClip could be considered as an excellent option for rapid correction of the severe symptomatic mitral regurgitation, although surgery is generally indicated in such cases with complex anatomy. The availability of the full spectrum of all the mitral therapy options in a single team allows the unbiased selection of the best tailored approach to the patient.

Potential competing interests
MZ received speaker fees and consulting from Abbott, Cardiovalve, Swissvortex, Edwards, Pfizer and Canon. FM received grant and/or research support from Abbott, Medtronic, Edwards Lifesciences, Biotronik, Boston Scientific Corporation, NVT, Terumo; consulting fees, honoraria from Abbott, Medtronic, Edwards Lifesciences, Peri-fect, Xeltis, Transseptal solutions, Cardiovalve, Magenta; royalty income/ip rights from Edwards Lifesciences (FMR surgical annuleplasty); and is shareholder (incl. stock options) of Cardiovalve, Magenta, Transseptalsolutions, 4Tech, Perfect, Coregard, SwissVortex. MM is consultant for Japan Lifeline. MT is consultant for Abbott, Boston Scientific; Received fees from Edwards Lifesciences, Mitraltech, Swissvortex, CoreMedic; and is shareholder of 4tech.

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