

# MVT Intermediate: November 7-9, 2022

## Hybrid via Berlin & Edwards Masters

### Summary & Highlights, Sessions 1-2

#### Monday, November 7, 2022

##### Summary

The first afternoon of the course included 2 live surgeries, 4 classic lectures, 1 live-in-a-box case, 3 patient case discussions, 1 special lecture, and multiple discussions. Following a hybrid format, the live surgeries were viewed in 3D by the audience in Berlin and in 2D by all of the online attendees. The remaining lectures, cases, and discussions were interspersed throughout the afternoon, shedding light on imaging, access, and repair techniques for mitral valve pathologies.

##### Highlights

###### Session 1

##### Imaging and Access

To begin, course co-directors **Volkmar Falk** and **Joerg Kempfert** introduced the upcoming live surgeries performed by **Antonios Pitsis** (3D endoscopic mitral valve repair) and **Stephan Jacobs** (minimally-invasive mitral + tricuspid valve repair). During the live cases, **Alison Duncan** shared some of her insights on the current and future trends of preoperative imaging. She touched on the importance of the experience of the imaging operator and how they should communicate with the surgeon, while considering the surgeon's experience, to help determine the feasibility of repair. To conclude, she noted that imaging may be able to help with ring selection, chordal insertion, and surgical intervention in the future. Also during the live cases, **Michael Borger** presented a series of interesting patient case discussions. One patient had severe MR, NYHA III symptoms despite GDMT, previous CABG x3, ischemic cardiomyopathy, paroxysmal AF, and pulmonary HTN. Another patient was young with a bicuspid aortic valve, chronic heart failure, and moderate functional mitral regurgitation, whereas the final patient case included a young patient with an aortic root aneurysm, Marfan syndrome, a family history of aortic dissection, and mild mitral regurgitation on preoperative TEE. Each case was logically described, and Dr. Borger guided the audience through a stepwise decision-making process using previously published data, guidelines, and various imaging techniques. **Joseph Zacharias** then provided some tips and tricks for minimally-invasive mitral valve repair access and exposure. He began by stressing the importance of pre-operative imaging including a TOE, angiogram or CT angiogram, a CT scan of the peripheral vessels, ultrasound scanning for femoral vessels, and a chest scan for lung adhesions. Dr. Zacharias also mentioned that discussing cannulation plans with the perfusionist and choosing good Heart Team members are extremely important. He also provided some of his thoughts on direct vision and endoscopic access options in addition to rib space and location for incisions. Lastly, Dr. Zacharias stressed the importance of experience and capturing your learning curve in order to achieve the best outcomes. Concluding the presentations of Session 1, **Piotr Suwalski** provided his thoughts on the current state of robotics in cardiac surgery in Europe and supported his view with promising data in support of robotic procedures. He then walked the audience through a live-in-a-box case where robotics were used for a mitral valve repair.



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## Session 2

### Repair Techniques – Type II Pathologies

Session 2 began with **Ruggero De Paulis** providing a clear overview of the “myths and science” of annuloplasty rings. He provided a brief overview of the history of annuloplasty rings and how important they are as the lack of a ring serves as an independent risk factor for repair failure and new mitral regurgitation. Dr. De Paulis then shed light on the conundrums of the use of rings or bands, the rigidity of the annuloplasty, and, of course, the question of whether rings should be open or closed. To conclude, he highlighted the importance of a flexible 3-dimensional open saddle shape to reduce mechanical stress and increase leaflet coaptation. Ultimately, he finished by saying that a surgeon’s personal preference, combined with the increasing number of annuloplasty options, make it difficult to ascertain exactly which type of annuloplasty is best, which introduced concepts that Volkmar Falk would discuss at the end of the session. **Giacomo Bianchi** then presented the first of two patient case discussions, both of which focused on the sizing and fixation of artificial chordae, ring selection, and implantation. He discussed the debate around open and closed rings and then continued by describing an algorithm that can help guide the repair of degenerative mitral regurgitation. After reviewing the different ways to repair the mitral valve with artificial chordae, he dove deeper into sizing and using imaging to help the decision-making process. To conclude, Dr. Bianchi took the audience through a step-by-step repair of a posterior and an anterior leaflet prolapse. Following, **Joerg Kempfert** presented a patient case discussion using pre-measured loops. He began by stating that TEE-based planning of the repair strategy is the first step to success and that a thoracotomy approach would likely result in good exposure. He continued by providing an overview of repair techniques ranging from resection to chordal replacement. After presenting data to support the use of artificial chordae and sparing leaflet tissue (respect, not resect), Dr. Kempfert provided instructions for how to choose the correct chord length using pre-measured loops. Next, **Lucia Torracca** explained why she thinks resection techniques are still valid options for mitral valve repair. She touched on instances where excessive leaflet width and height may be indications for resection, but she stated that the anatomy of the valve is not the only factor to consider. As genetic factors could mediate the matrix remodeling of the tissue, genetic factors should also be considered because different downstream factors could ultimately affect mechanical stress on a combination of the leaflet, chordae, and papillary muscles. To conclude, Dr. Torracca mentioned that the choice of resection technique should reflect the desired outcome of reducing mechanical stress, thereby reducing one of the mechanisms of late repair failure. After a panel discussion, **Volkmar Falk** gave a special lecture on the topic of precision medicine in mitral valve repair and discussed the feasibility of truly individualized treatment. Incorporated into the idea of individualization, he elaborated on the importance of multilayered “-omics” (genomics, proteomics, etc.), artificial intelligence, and computational modeling in order to better characterize patients. To elaborate on how predictive modeling could assist cardiac surgeons, Dr. Falk gave simple yet effective examples of personalizing annuloplasty ring design and implantation technique, simulating post-operative valve dynamics, and more.



# MVT Intermediate: November 7-9, 2022

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### Summary & Highlights, Sessions 3-4

#### Tuesday, November 8, 2022

##### Summary

The second day of the course included a morning session, focusing on surgery beyond leaflet prolapse, and an afternoon session, focusing on advanced technologies and patient management. Each session contained 2 live surgeries, bringing the course's total to 6 live surgeries. The morning session also included 3 lectures and 1 patient case discussion, while the afternoon also included 2 live-in-a-box cases and 3 lectures. Therefore, the main portion of the course (sans Wednesday's workshops) included a total of 6 live surgeries, 11 lectures, 3 live-in-a-box cases, and 5 patient case discussions: a very informative course, indeed.

##### Highlights

###### Session 3

##### Surgery Beyond Leaflet Prolapse

Starting off the second day of the course, **Prof. Volkmar Falk** introduced the morning's live surgeries performed by **Prof. Michael Borger** (minimally-invasive mitral valve repair) and **Prof. Joerg Kempfert** (3D endoscopic mitral valve repair with an endoballoon). **Dr. Axel Unbehaun** then provided an update from the previous day's successful live surgeries, and **Prof. Piotr Suwalski** then gave the first presentation, which was about concomitant atrial fibrillation ablation and left atrium appendage management. His presentation included an array of topics ranging from different Maze procedure techniques, ligation, left atrium appendage clipping, removal, and more. **Dr. Thilo Noack** then spoke about FMR surgical options and when and how to operate. He began by providing an overview of the different causes and characteristics of FMR and described the technicalities and outcomes of numerous techniques including subvalvular procedures such as papillary muscle approximation and repositioning. Dr. Noack concluded by stressing the importance of the Heart Team for assessing the stage of MR, pathoanatomy, comorbidities, treatment goal, and treatment feasibility for FMR. Next, **Prof. Gloria Farber** presented an interactive patient case discussion focused on when and how to concomitantly repair the tricuspid valve (alongside a mitral valve intervention). She brought forward many rhetorical questions to the audience and supported her decisions with previously published data. **Prof. Farber** also discussed how to deal with the pacemaker lead, whether to repair the tricuspid valve on a beating heart or an arrested heart, how to prevent right ventricular failure, and whether a sternotomy or minimally-invasive approach should be adopted. To conclude the morning's session, **Prof. Gilles Dreyfus** gave an informative lecture about the "do's and don'ts" of tricuspid surgery. He laid out the main mechanisms for functional tricuspid regurgitation and stated that in his own practice, out of 441 patients with degenerative mitral regurgitation, only 4 patients had severe tricuspid regurgitation, which opens up the door to treat patients with less than severe tricuspid regurgitation. In doing so, he recommended that surgeons should also consider the tricuspid annulus size, leaflet coaptation mode, and whether tethering is present. **Prof. Dreyfus** also noted that tricuspid regurgitation is not only in older females, that moderate or less regurgitation is not benign, and that pacemaker implantation may not be necessary right away as many patients with AV block recover within 2 weeks.



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All in all, he acknowledged that functional tricuspid regurgitation should be treated, but exactly when and how remains to be determined.

#### Session 4

### Advanced Technologies and Patient Management

To begin the final session of the course, **Dr. Markus Kofler** performed a 3D endoscopic mitral valve repair alongside **Prof. Joerg Kempfert**, and **Prof. Piotr Suwalski** also performed a 3D endoscopic mitral valve repair. **Prof. Marco Di Eusanio** presented a live-in-a-box mitral valve repair case via transaxillary access. He indicated how transaxillary access results in excellent direct vision, reduces the distance from the surgeon's hands to the valve, and allows the hands and eyes to be very well-aligned. **Prof. Di Eusanio** also indicated that transaxillary access has a minimal learning curve and does not require an endoscope on the table. After showing multiple videos of himself operating via transaxillary access, he concluded by saying that it is possible to access multiple valves, reduce cross-clamp and operative times, and reduce visible scarring. Therefore, he encouraged the audience to learn the transaxillary approach. **Dr. Joseph Zacharias** discussed some of the complications that may arise after endoscopic mitral valve surgery and how to avoid them. During his presentation, **Dr. Zacharias** covered a wide range of complications including groin seroma, nerve pain and damage, femoral vessel complications, aortic dissection, coronary artery injury, aortic valve injury, and more. Despite all of these complications being quite rare, he provided concrete recommendations for avoiding them. To conclude, he stated that most complications are not necessarily failures, but learning opportunities. Next, **Dr. Giacomo Bianchi** returned to provide some tips and tricks for redo mitral valve surgery. Overall, he stressed the importance of standardization, planning, and the reproducibility of procedures. Specifically, he provided tips regarding lung adhesions, pericardial opening, cross-clamping, myocardial protection, and other surgical considerations. **Dr. Thilo Noack** then presented a live-in-a-box case using a transcatheter valve repair system where the Heart Team concluded that the surgical risk was quite high, which resulted in a successful and uneventful transcatheter edge-to-edge repair. Following this, **Prof. Simon Sundermann** then discussed mitral valve surgery after interventional therapy. He began his presentation by showing data that reported similar early outcomes of two different transcatheter edge-to-edge repair devices, but he then stated that the number of patients with recurrent mitral regurgitation after an intervention is increasing. Perhaps most interesting, he showed that despite the similar promising early outcomes between the devices, he indicated that one device was easier to remove than the other, likely due to the differences in the locking system. Therefore, the main takeaway from his presentation was that surgeons and interventional cardiologists should not only be aware of the outcomes of their operations and procedures, but they should be aware of other nuances, such as ease of removal, in case it would be necessary at a later date. He concluded by presenting data to show that degenerative mitral regurgitation may be eligible for mitral valve repair, but that functional mitral valve regurgitation may require mitral valve replacement.

