When a simulation laboratory becomes essential

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New techniques, including minimally invasive approaches, have in the past most frequently been directly brought to the clinical operating room and tried on individual patients. With the introduction of the cardioscopic intervention described in the study of Leopaldi¹ in this issue of the *Journal* and in another recent laboratory study used on the closed, beating heart,² the value of making available a training facility as described in the article documenting the experience with the dynamic cardiac biosimulator becomes very clear, and its implementation before clinical use on patients seems essential. Surgical training today, with the increasing use of laparoscopic, thoracoscopic, and robotic interventions, has been greatly enhanced by the implementation of simulation laboratories. The requirement that cardiothoracic residency programs provide a minimum of 20 hours of simulation training to qualify for certification of the American Board of Thoracic Surgery highlights the importance of this enhanced laboratory training. With the introduction of this closed cardiac beating-heart repair for mitral valve leaflet prolapse from chordal rupture and the initiation of the randomized US ReChord clinical trial comparing this cardioscopic technique with standard open repair on cardiopulmonary bypass, training practicing cardiac surgeons on the new technique before clinical implementation in the randomized trial becomes paramount.

Our team and institution at the University of Texas Medical Branch have been dedicated to the development of simulation as a research and educational tool to improve clinical outcomes for many years.³⁻⁵ In our simulation center, LSTAR (Laboratory for Surgical Training, Assessment, and Research), we are currently using a similar high-fidelity cardioscopic model to improve the instrumentation and surgical approach for various procedures.

As the Leopaldi and colleagues¹ point out, the limitations of the study presented are that definitive metrics documenting the efficacy of the cardioscopic procedure training were

Vincent Conti, MD (left), and Alexander Perez, MD (right)

Central Message

It will become increasingly important to be able to provide simulation laboratory experience to prepare surgeons to perform procedures such as the beating-heart mitral valve repair.

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not well documented, although it was the opinion of the trainers that the laboratory experience was successful in achieving their goal. It was also noted that an obvious limitation of the chordal replacement-only procedure was that no annuloplasty, such as is almost always included with open procedures currently done, could be performed. The US ReChord trial is therefore assumed to be limited to patients without mitral annular dilatation. With the high success rate and low risk currently seen with open mitral repair procedures, this new cardioscopic procedure will have to achieve excellent results to justify replacing the standard approach.

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