the best of our knowledge, this is the first low-fidelity model ever described, in which all of the above-mentioned techniques can be rehearsed. At present, one low-fidelity mitral valve simulator is commercially available, manufactured by the Chamberlain Group. The Chamberlain simulator has been well-received in academic and medical device circles since its introduction in 2002 although, in our opinion, it has several disadvantages [5]. It is only possible to practice one or two procedures out of the wide range of mitral valve surgery techniques; the device lacks the very important subvalvular apparatus and the model is only moderately pliable, which permits only a limited degree of traction and relaxation during suture placement [3]. Additionally, the simulator is designed for one-time use only if leaflet resection is performed. Costs could be as high as US$105 for a single training session in, for example, quadrangular leaflet resection.

As a low-fidelity simulation, our simulation model is perfect for novice learners: an important feature is that it can be disassembled into teachable components, and its handling and the developed skills of a trainee can be assessed objectively by a supervisor. In mitral valve surgery, one of the most important skills is correct suture placement in both the annulus and the leaflets. The greatest advantage of this study model is the transparency of the simulated mitral annulus and subvalvular apparatus. This permits objective assessment of the depth of bites and spacing between sutures. As well as transparency, our model provides inferior access to the valve through the trainer base, which is also possible in our new Mitral Valve Prolapse Trainer of the Chamberlain Group.

Other benefits of our novel low-fidelity simulator, for both mitral valve and tricuspid valve surgery, are that the silicone ring tolerates real-life traction and is reusable for up to approximately 45 suture placements. This model is easy to assemble and components are available worldwide; it is easily portable and materials can be stored inside it.

This simple and versatile tool has the potential to provide an even more comprehensive training platform for aspiring cardiothoracic surgeons and can be made and used virtually anywhere. With its ability to simulate a wide range of scenarios in mitral valve surgery, this model may contribute to the development of technical skills and procedural knowledge required for adequate performance in the operating room. Further studies are needed to validate and evaluate this novel simulation model in order for it to be an effective training platform in the cardiothoracic surgery residency program.

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REFERENCES


SUPPLEMENTARY MATERIAL

Supplementary material is available at ICVTS online.

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We have read with great interest the paper by Verberkmoes and Verberkmoes-Broeders [1]. They aimed to develop a low-fidelity, reusable and portable simulation device, which could provide training in nearly the full range of mitral valve surgery techniques. It is so important to achieve this kind of device with low cost for skill acquisition especially for residents. Because of its portability, it can be used in every place and at any time and provides advantage for the residents who have little time to make practice. After the widespread acceptance of minimally invasive approaches for mitral valve repair surgery which requires expertise, the importance of training models has become more evident. [2] In this era, we believe that such training models would be beneficial especially for young surgeons. In this valuable report, there is a particular topic we would like to discuss.

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REFERENCES


eComment. How important is feedback in surgical simulation models?

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*Department of Cardiovascular Surgery, Diyarbakir Military Medical Hospital, Yenişehir, Diyarbakir, Turkey doi: 10.1093/icvts/ivs552 © The Author 2012. Published by Oxford University Press on behalf of the European Association for Cardio-Thoracic Surgery. All rights reserved.
While there are many reports in literature advocating the advantages of simulation models, few model for mitral valve repair surgery are available. The reported model may optimize learning and result in skill acquisition. Establishing various pathological conditions in this model, according to Carpentier’s Functional Classification, makes this model preferable. Gauging maximum mean suture tensions on the silicone teat and dental dam is also a good guiding mark for the surgeons to train on adjusting suture tensions.

Although the authors aimed to construct a ‘low fidelity model’ reflecting real-life experience for the ‘operating room’ (model fidelity) [3], and it is sufficient for motor learning, the major issue to be discussed in this model is the problem of a limited feedback, since we do not receive positive or negative feedback after each practice [1] as with the first version of our simulator [4]. Therefore, we have added a pressure system to our model to test each practice under static pressure. In conclusion, although this model has the advantage of low-fidelity and low cost, and can be used on numerous techniques, a tool or mechanism to provide feedback may be helpful for the trainees. For example, Greenhouse at al. [5] performed a test to assess the effectiveness of their model, thereby revealing how useful the model was and what the surgeons took home.

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References


