

Tricks and tips to facilitate robotic approach for mitral valve repair



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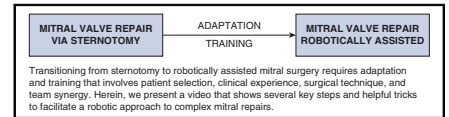
Read at *The American Association for Thoracic Surgery Mitral Conclave, New York, New York, May 4-5, 2023*. Received for publication July 30, 2023; revisions received Aug 30, 2023; accepted for publication Sept 16, 2023; available ahead of print Sept 26, 2023.

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JTCVS Techniques 2023;22:84-5
2666-2507

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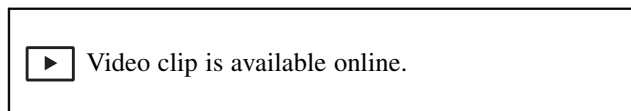
<https://doi.org/10.1016/j.jtc.2023.09.020>



Transition from sternotomy to robotic mitral repair requires adaptation and training.

CENTRAL MESSAGE

There are a number of key steps and helpful tricks that facilitate a robotic approach to complex mitral repairs.



The robotic approach for degenerative mitral repair is safe and effective.^{1,2} Nevertheless, transitioning from sternotomy to the robotic approach requires training and adaptation involving clinical and technical aspects (Figure 1). Patient selection and surgical technical aspects of the robotic approach are essential to achieve excellent results.² This video aims to demonstrate a robotically assisted mitral valve repair for Barlow's disease. The video (Video 1) will focus on critical steps and helpful tricks for a robotic approach to complex repairs.

CASE VIDEO SUMMARY

A 29-year-old man presented with symptomatic severe mitral regurgitation. The patient's informed consent was obtained for this publication; institutional review board approval was not required.

Transesophageal echocardiogram demonstrated diffuse bileaflet prolapse. Based on these findings, a repair was

planned to consist of anterior neochords, posterior leaflet resection, sliding valvuloplasty, and annuloplasty. The patient was brought to the operating room. General anesthesia was performed with double-lumen endotracheal tube intubation to allow single left lung ventilation.

The setup for the robot approach is shown in Video 1. The right femoral vessels are exposed first. After assessment of the femoral vessels, a small lateral minithoracotomy is made in the fourth intercostal space (ICS), starting from the anterior axillary line and extending anteriorly. The robotic atrial retractor is placed in the fourth ICS, in the midclavicular line. The left instrument port is placed in the second ICS, approximately halfway between the midclavicular and the anterior axillary lines. The right instrument port is placed in the sixth ICS below the anterior axillary line. Two angi catheters are placed in the midaxillary line for posterior pericardial traction sutures. We routinely use a detachable clamp to crossclamp the ascending aorta and antegrade root cardioplegia to arrest the heart.

The repair begins by placing 2 sets of artificial chordae to the anterior leaflet. In cases where the likelihood of needing anterior neochords is high, it is best to insert there before

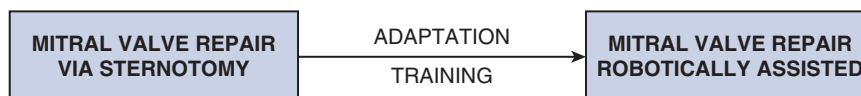
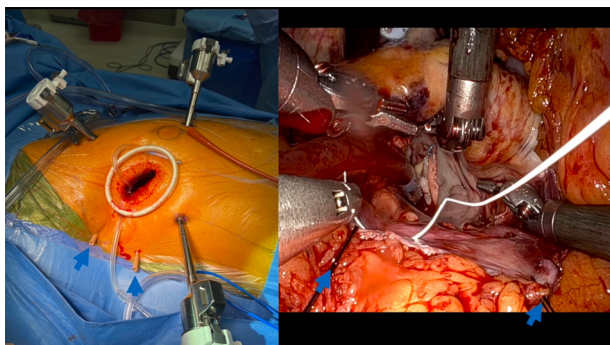


FIGURE 1. Transitioning from sternotomy to robotically assisted mitral surgery requires adaptation and training that involves patient selection, clinical experience, surgical technique, and team synergy. Herein we present a clinical case that portrays several key steps and helpful tricks to facilitate a robotic approach to this complex mitral repair.



VIDEO 1. Demonstration of a robotically assisted mitral valve repair for Barlow's disease. Video available at: [https://www.jtcvs.org/article/S2666-2507\(23\)00366-8/fulltext](https://www.jtcvs.org/article/S2666-2507(23)00366-8/fulltext).

completing a posterior leaflet resection because the reconstructed posterior leaflet can obstruct the surgeon's view of the papillary muscles. Next is performed resection of P2 and detachment of the P1 and P3 scallops from the annulus for sliding repair. A key step is identifying the location on the annulus where the 2 halves of the leaflet will meet to achieve perfect symmetry. The posterior leaflet is reconstructed using a modified interrupted suture technique.³ Next an annuloplasty using a flexible band is performed, which allow us to use a running suture technique.^{3,4}

In most cases, the need for a commisuroplasty is assessed on static testing after the annuloplasty is performed. This suture is easy to place, even after annuloplasty, and is occasionally unnecessary after other repair techniques have been

performed. In this case, we decided to perform a medial commisuroplasty due to a residual P3 prolapse.

Postoperative transesophageal echocardiogram demonstrated no residual mitral regurgitation and a mean gradient of 2 mm Hg. The patient's hospital course was uncomplicated.

CONCLUSIONS

Successful repair of Barlow's disease often requires multiple techniques and can be complex. Several key steps and helpful tricks are shown in [Video 1](#) that facilitate a robotic approach to these complex repairs.

Conflict of Interest Statement

The authors reported no conflicts of interest.

The *Journal* policy requires editors and reviewers to disclose conflicts of interest and to decline handling manuscripts for which they may have a conflict of interest. The editors and reviewers of this article have no conflicts of interest.

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