Mitral repair failures are not the robot's fault!

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Mitral valve repairs can fail! Many of us were taught that a good repair would last a lifetime without a leak. Not true! Degenerative mitral disease is diseased tissue that is not normal. David and colleagues, master surgeons using proven repair techniques, followed repair patients using echocardiography for 20 years. In 840 patients, they reported a 5.9% failure rate with a 91% freedom from reoperation; however, only 69% were free ultimately from moderate to severe regurgitation.¹ In 1218 patients, Suri and colleagues² showed at 15 years that 13% had greater than moderate mitral regurgitation with 6.9% reoperations. These and many other published reports show us that repair failures can happen even in the best hands and with classic surgical techniques. Repair failures develop from progression of disease, endocarditis, or technical problems. Untreated primary lesions, annuloplasty prosthesis dehiscence/mismatch, leaflet suture tears, over/underresection, and excessive leaflet tethering are primary causes of technical failures. Leaflet fibrosis, chordal elongation or rupture, calcification, and tissue ingrowth can also result in a late failure.

Robotic mitral surgery evolved in a linear progression via minimally invasive approaches that have equivalent results as traditional operations. The Mayo Clinic group³ found in matched cohorts of robotic and sternotomy repair patients that outcomes were similar, despite longer perfusion and arrest times. In the current report by Taggarse and colleagues,⁴ 619 robot-assisted mitral repair patients were followed with only 1.1% requiring a reoperation. Other large, robot-assisted procedure series have demonstrated excellent repair rates with few reoperations. Murphy and colleagues⁵ reported 1257 repairs, among which 3.8% of patients required a reoperation. However, in the later half of the series, failures dropped to 0.9%.⁵ Our inaugural series of 944 patients had a 2.5% failure rate for concomitant operations and 1.7% with a lone repair.⁶

The importance of the article by Taggarse and colleagues⁴ is in the detailed description of the mechanism of failure in robot-assisted mitral repairs. Moreover, the authors suggest ways to minimize failures. All of the surgeons used the same repair technique, namely a

Robot-assisted mitral repair: Excellent papillary muscle access placing polytetrafluoroethylene neochords.

Central Message

Mitral valve repairs can fail! This is diseased tissue. The authors analyze the mechanism of their very few failures and continue to show that these are not related to using robot assistance.

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triangular resection with or without neochords and a single length trigone to trigone annuloplasty band. Perhaps this standardized technique aided in getting such good results. Of the 5 repair failures, 4 patients had complex disease. The mechanism of failure was either an annuloplasty band dehiscence, ruptured anterior leaflet chords, elongated posterior leaflet chords, or a detached neochord. In most patients there was a mixture of reasons. The article⁴ reaffirms that both 2-dimensional and 3-dimensional transesophageal echocardiography should be in use in operating rooms to disclose complex pathology that may not be addressed otherwise. Three failures were early, suggesting technical problems that may have been avoided by fine echocardiography analysis.

I applaud the authors for carefully analyzing the reasons and possible predictors of repair failure. They dispel the notion that a robot-assisted operation, in the right surgeon's hands, can render a less-than-adequate repair. By now we should believe that **failures are not the robot's fault**.

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